Building a sustainable region?

The fourth city region
Abstract
There are three official city regions in Sweden at the moment. This thesis investigates the process to create a fourth, the development of Linköping and Norrköping, twin cities strategically placed in reach of the other three metropolitan areas. Strategic planning implies a perspective where different instruments and indicators which complements or contradicts each other. The importance of the collaboration between different plans could have synergetic or cumulative effects. Urban development is a progress over a long time period and the infrastructural projects will have even longer effects. Environmental assessments like EIA and SEA and other methods, which are used in different parts of strategic planning, aims to identify and reveal goal conflicts. They also discuss alternatives and unsustainable effects as a base for decision making. Sustainable development can be seen as a goal or a process, both perspectives is highly dependent on of infrastructure and other physical structures in the society. The results of this study express an urgency of transition towards a more cautious attitude towards the future development. The alignment of regional development that can be followed through out the investigated plans shows a strong focus of economic growth, rather than finding sustainable solutions.

Keywords
Regional Planning, Sustainable Development, Fjärde Storstadsregionen, Comprehensive planning.

Foreword
This thesis is written in the spring term of 2008 at the masters program; European Spatial Planning and Regional Development at Blekinge Institute of Technology. The thesis combines my interests in urban development with environmental care. The choice of study object is influenced by my undergraduate studies in Environmental Science at the University of Malmö. The views in this report are those of the author, and not necessarily the views of the municipalities and other organisations mentioned in this thesis.

Acknowledgments
I want to thank everybody that helped me in realising this thesis. My special thanks are going to my supervisor Lars Emmelin and Jan-Evert Nilsson for their support and advices.
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<thead>
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<th>Description</th>
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<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
</tr>
<tr>
<td>DDP</td>
<td>Detailed Development Plan</td>
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<tr>
<td>EEA</td>
<td>European Environmental Agency</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessments</td>
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<td>EQO</td>
<td>Environmental Quality Objectives</td>
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<tr>
<td>IPCC</td>
<td>Intergovernmental Panel for Climate Change</td>
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<td>ITPS</td>
<td>The Swedish Institute for Growth Policy Studies</td>
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<td>NUTEK</td>
<td>The Swedish Agency for Economic and Regional Growth</td>
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<td>RDP</td>
<td>Regional Development Plan</td>
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<td>RTP</td>
<td>Regional Transport Plan</td>
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<tr>
<td>SCB</td>
<td>Statistics Sweden</td>
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<tr>
<td>SEA</td>
<td>Strategic Environmental Assessment</td>
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<td>SEPA</td>
<td>Sweden’s Environmental Protection Agency</td>
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<td>SIKA</td>
<td>The Swedish Institute for Transport and Communication Analysis</td>
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<td>SOU</td>
<td>Reports of the Governmental Commissions</td>
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1. The fourth city region

There are three formal city regions in Sweden at the moment: Stockholm, Gothenburg and Malmö. These areas are the main economic growth engines in Sweden and the economical activity is also focused to the city regions in Sweden, over 50% of the total amount of income and 47% of the people are sited in these areas. The regional development in Sweden shows tendencies towards increasing urbanisation and other factors, such as demography and globalisation are also factors that affect this development. (ITPS, 2008)

At the National level there is important to have more strong regions to obtain sound economic development. The Swedish government does not have a strict political view on the role of city politics, which could be a problem for the development and support for the Fourth City Region. Norrköping and Linköping have been competing cities for decades, but in 2002 the idea of cooperation was launched. The cities nowadays present themselves as a region with two city centres, centres with different characteristics. Both Norrköping and Linköping municipalities are considered as big in Swedish terms of population, together the city centres has 260 000 inhabitants which puts them in the same league as Malmö. The region of Östergötland consists of 416 000 inhabitants and 36 000 companies. (Fjärde storstadsregionen, 2003)

The creation of a fourth city region is a project that aims to connect the two growing cities Norrköping and Linköping to a strong competitive region at a local, regional, national and international level. The project is primarily driven by the municipalities of Norrköping and Linköping, but other associates are the regional county board Östsam and the County Administrative Board is also involved. The project aims to draw attention to the growing region and make it more prosperous. The cities are placed in eastern Sweden strategically placed between Stockholm, Gothenburg and Malmö, with a distance of 43 km between them. The cities are placed in a strategically important region with good connections to the three city regions in Sweden and particularly Stockholm. At the Regional and Local level the project is very important to gain and obtain the positive development in the twin cities. Strong cities generally generate growth to other surrounding smaller towns in the region according to economic theories. (Fjärde storstadsregionen, 2003; Östsam, 2006a, Thyréns, 2007)

Today the fourth city region project is more or less a marketing project which is mainly driven by the marketing office in Norrköping and Linköping. The project has political legitimacy to cooperate with the regional office Östsam. The main aim with the project is to strengthen the development in Östergötland and the goals are to create a future region with 500 000 inhabitants. The number 500 000 is important because it means that the European Union considers 500 000 as a demand for being classed as a city region. (Fjärde Storstadsregionen, 2003)

The fourth city region in eastern Sweden is seen as an intermodality node on both a European Union and national level with the Port of Norrköping, railway connections, airports in both Norrköping and Linköping and the highways E4 and E22. The infrastructural situation of Östergötland supports the European Union idea of the Trans-European Networks where nodes of different means of transportation meet in intermodality nodes. The transport infrastructure in the region is highly developed but suffers from the higher demands and growing commuting and freight transports. (Williams, 1996; Fjärde Storstadsregionen, 2003)
The creation of a fourth city region is a multi-level project that concerns labour, education, hospitals, regional growth and attractiveness and infrastructure. The project aims to market the region as a city region and thereby increase the overall performance in the region. There is an ongoing process to get a common development structure that strengthens the process in the municipalities. The European Union favours these types of projects in order to strengthen the performance in regions in peripheral Europe to increase Europe’s competitiveness, increase the social and economic coherence and decrease disparities. The region is also a part of the Trans-European Network (TEN-T) project the Nordic Triangle. (Fjärde Storstadsregionen, 2003; Williams, 1996)

The project to create a fourth city region has no clear formal definition and consists of at least three different perspectives: a metropolitan city, twin city region with two strong centres and a functional labour region. The three perspectives are all based on political objectives, for example Ötsam the regional office, which is responsible for the wealth of 13 municipalities, through the whole county of Östergötland. Their perspective on the development of the region is to create a stronger region with a distinctive urban area. The municipalities in Linköping and Norrköping are more interested in building a metropolitan area with two city strong centres. The third perspective is a marketing perspective which aims to strengthen the picture and market the area as one metropolitan region. (Ötsam, 2006a, Fjärde Storstadsregionen, 2003)

The distance between the cities is short in terms of geography, but the cities have different culture and traditions which could cause problems. There are two municipalities that have to cooperate in a common planning framework. However the structural situation with two medium-sized cities, each of them with a city centre, is a problem when talking of one city region. (Fjärde Storstadsregionen, 2003)

1.1 History of the cities

Linköping has been the chief town in Östergötland since medieval times. The city has historically been one of the most important areas for the church and education. Linköping’s importance as a city has shifted over the centuries from an important town in medieval time to a small city. Until the beginning of the 20th century where Linköping a rather small city but started to grew rapidly during the 1950s. In the late 1980s, had Linköping grown to be the biggest city in the County of Östergötland. (Tyréns, 2007)

Norrköping on the other hand, is founded by the sea, on a place with good connections with the inland areas. The port of Norrköping has affected the city life and the structure of the city. Norrköping has historically been one of Sweden’s most important industrial cities, but has had repeatedly crises during the centuries. The industry in Norrköping has in the past focused on low tech industry. Norrköping have had a transition time with performance but has recently grown in importance. (Tyréns, 2007)

1.2 Purpose and the problem of the study

The purpose of this study is to discuss the connections between environment and regional development throughout transport infrastructure. The focus is to observe and present an overall perspective on the transport infrastructure planning from an environmental perspective. The ambition is that this study can contribute to the future regional planning in the County of Östergötland and the creation of a fourth city region in Sweden.
The main and overall question as a general interest in this study is; can you build a sustainable region? The purpose of the project is to strengthen the position for Linköping and Norrköping as a city region. The project to create a fourth city region concerns planning from many different perspectives, levels and different goals. In general spatial planning starts with policies and political intentions formulated into non-binding plans. These plans constitute the planning framework, in which other plans have to consider. Spatial planning is made on several different tiers, and the planning system is hierarchical with different sectors responsible for different areas. In this thesis the planning structure and perspectives will be investigated.

This study focuses on the approved planning documents considering the development in a fourth city region. The study focuses on the area concerning transport infrastructure and the environmental effects in the region. The study aims to investigate in, which way these plans consider sustainable development and which actions that are taken in order to attain a more sustainable regional development.

The main questions are:
- What type of transport and commuting development will the studied plans lead to?
- To which extent does sustainable development affect the alignment in the plans?
- Which type of regional structure is desirable?
- How well does the different tiers in the planning system correlate?

1.2 Delimitations of the study
This study does not cover the whole area of the multidisciplinary field of sustainable regional development. For this understandable reason, is the study delimited to investigating planning for infrastructure and transportation. This study has an environmental science approach towards regional planning in the county Östergötland in Sweden and the cooperation between the two cities of Norrköping and Linköping in particular.

The study focuses on the development of transport infrastructure in a sustainability context in the region. Since there is wide range of perspectives in sustainable development which cannot be covered, this thesis intends to discuss and enlighten some of the consequences of possible unsustainable tendencies. The wide concept of sustainable development will not be covered as a whole in this study. It is important to remember that regional development includes a great number of aspects to the concept of sustainability such as public health, education, crime, democracy and equality. Transport and infrastructure are truly dependent on these wide aspects of sustainability but will not be covered in this study.

1.3 The Structure of the study
The study rests upon the previously mentioned questions and delimitations. The Second chapter discusses different regional development concepts, the wide concepts of sustainable development, different approaches of hierarchical and power structures in spatial planning. The third chapter presents and problemize the present and intentional future development in the fourth city region. The fourth, fifth, sixth and seventh chapter investigates key plans in the County of Östergötland that will have great impacts for the future development of a fourth city region. Chapter eight summaries and discuss the results and conclusions that can be
drawn from the Regional Development Plan, the Regional Transport Plan, Norrköpingspaketet and the Comprehensive plan for the City of Linköping. These plans are discussed from inside to outside with background, concepts and intentions. The last chapter concludes the study and presents and discusses the results and assess the intentions from the strategic plans.

1.4 Methodological aspects
The material concerning the development in the region is based on prognoses, visions and scenarios. The development framework considers a wide spectrum of issues, from urban attractiveness to infrastructure. The pre-studies and political intentions are however formulated in adopted plans. These plans, legally binding or not will affect the development of the region in both theoretical and practical ways. The study concerns EU documents, national plans, regional plans and municipal comprehensive plans. They are investigated in order to follow the hierarchical planning system and the approach to sustainable development. This study focuses on the written and adopted plans and what conclusions that can be drawn from them.

In this study is various materials used to describe the present planning situation in the County of Östergötland in eastern Sweden. The material covers fields of regional development, urban development, sustainable development and national authorities. The cases of the Regional Development Plan, Regional Transport Plan, the infrastructural project Norrköpingspaketet and the Comprehensive plan of Linköping has of course great importance in the study.

The plans and reports investigated in this study are approached by a hermeneutical perspective. The hermeneutical interpretation aims to understand the designated and expressed purpose with a text. The hermeneutical interpretation is founded in the process to weight different parts or sentences of the text against the general impression of the same. The hermeneutical method is based on a circular process which continues until a homogenous picture can be presented. The method is based on scrutinizing the text in order to find contradicting tendencies between different themes, sentences to the overall picture. The interpretation of texts or literature in general is affected by the background of the investigator; this is inevitable, but contributes to expand the understanding of the text from new perspectives. (Kvale, 1997)

1.4.1 Tiering
In order to understand the hierarchy and legislative system and how it affects the development is the concept of tiering used. The concept of tiering was developed in the Strategic Environmental Assessment process. The main idea in tiering is to analyse plans on different levels and thereby scope the environmental effects. Environmental Impact Assessment (MKB) is made to different extent during projects in infrastructure. Tiering can be used in order to link the effects on different tiers in order to take better decisions, prevent postpone and better scoped assessment. The European Union states in the SEA-Directive (2001/42/EC) that tiering should be used on both EIA (Environmental Impact Assessment) level and SEA (Strategic Environmental Assessment) level. According to the Directive (2001/42/EC) is SEA and EIA directly linked. The connection between the strategic and more practical level is obvious SEA sets the framework for the future development and EIA is an important part of this process.

The Swedish planning system consists of a linear process with a clear hierarchy in theory. The planning system has clear relationships between the different levels. The base for this
hierarchical system is the subsidiary principle which states that problems should be solved at the appropriate level. This idea is the base for the municipal planning monopoly in Sweden. Planning is a complex and dynamic process, decisions is taken throughout the process. The decisions made throughout the process that have impacts on the environment; decisions influenced by policies, scientific evidences, environmental insights and political intentions. The base for decision making is never complete and decisions include a certain amount of uncertainty. Different methods to assess and predict the effects from the plans are used. The problems with these methods are that they are used as “truth” without assessing a broader perspective with elements of indirect and large-scale effects. To assess the result of a plan the dynamic interactions has to be discussed. (European Commission, 2000) The figure below examplifies the planning hierarchy and its connections to environmental assessments.

### Fig. 1

<table>
<thead>
<tr>
<th>Level of Governance</th>
<th>Policies (SEA) Plans (SEA)</th>
<th>Programs (SEA) Projects</th>
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<tbody>
<tr>
<td>National</td>
<td>National Plans</td>
<td>Long-term Transport Policy</td>
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<td></td>
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<td>Regional/State Plans</td>
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<td>Regional/State</td>
<td>Regional Strategic Plan</td>
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<tr>
<td>State</td>
<td>Local Plans</td>
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(Adopted from Wood et al, 2005 p7)

Tiering is a method to connect the actions taken on the local level to the strategic plans taken on the regional and national level. The tiering method has a two-way approach; top-down and bottom-up perspectives. Tiering is all about choices and the effects from them. The strategic plans like regional plans and comprehensive plans estimates and predict certain amounts of effects from the plans. Because of the hierarchical planning system is feedback from municipal projects normally not considered in the aspects form tiering. The indirect and cumulative effects from plans on different levels are often not assembled. The cumulative effects are often underestimated and small projects are often considered to only have a small influence on the bigger scale – which is true, but if all projects are considered to have a small impact the cumulative and long-term affects might be hard to handle. The planning process needs transparency and feedback processes on both bottom-up and top-down plans. (Wood et al, 2005; Arts, Tomlinson & Voogd, 2005)

Planning for infrastructure is made on many different levels. Planning on the national level is managed by laws, decrees, regulations and ordinances. The politicians are responsible for the investment grant and the prioritising between different projects. The regional council is responsible for RDP and RTP. The local municipal level is responsible for the comprehensive plan and the overall perspective for the municipality. (SIKA, 2007)
The Swedish planning systems is based on that the municipalities carry the main responsibility for spatial planning, due to the planning monopoly. The comprehensive plan is the main instrument which concerns planning issues for the whole municipal area. It covers planning issues of all land and water areas. The comprehensive plan must be assessed by the municipal council each term of office. The comprehensive plan is not legally binding and works firstly as a framework for future development. The comprehensive plan expresses the intentions for planning and is a tool or base for discussing development. (European Commission, 2000)

The sector responsibility is important in the Swedish planning system; different administrations are responsible for different areas in the planning sector. The National Road Administration is responsible for the national road transport system; the National Railroad Administration is responsible for the railroad system and so on. The different authorities have been commissioned by the Swedish Government with the overall sector responsibility for their specific field. The problem according to SIKA is that the sector responsible leads to goal conflicts. The different authorities have a deficiency to cooperate towards a sustainable transport system. There is however a lack of guidance from the government how to solve this kind of problems. SIKA recommends a better co-ordination between the administrations to reach better efficiency and shorten the time from plan to implementation. (SIKA, 2007)

Because of the sector responsibility and the political goals of transportation, all means of transportation optimises their possibilities to obtain their specific goals. There is a need of evaluation in how the different means of transportation can complement each other and which one the focus should be on. Meeting the need of transportation should according to SIKA, be the primary objective as well as reaching national goals and strategies. (SIKA, 2007)

The Swedish planning system is as mentioned, based on the principle of the municipal planning monopoly. The municipalities have a strong position with its comprehensive responsibility for physical planning and development. The Planning and Building Act and the sector responsibility can, according to SIKA create a locked-up situation where the coordination between administrations and authorities focuses on its own sector and does not contribute to the overall objectives. Hierarchy, different objectives, different timeframes in planning and technical difficulties makes it hard to coordinate infrastructural projects. Regional development is a process where different sectors have to cooperate. The transport system should extend the integration between the four means of transportation; rail, road, sea and air. SIKA argues that the stakeholders have to discuss issues like: housing, means of transportation, land-use, planning and infrastructure. (SIKA, 2007)

Emmelin & Lerman (2005) argues that there is a lack of tiering in the Swedish planning system. The planning monopoly and the rather limited authority on the national level lead to weak connections from top-down and bottom-up perspectives. Old structures in the planning system lead according to Emmelin and Lerman to low transparency in the planning system.

1.4.2 Main instruments in Sweden’s planning system

The base for planning is in Sweden is the Planning and Building Act and the Environmental Code. The Environmental Code as it looks like today, was introduced in 1999 and is a tool for sustainable development in Sweden. The Environmental Code regulates the impacts for the environment in the physical environment and is in many ways deeply connected with the
Planning and Building Act. The Environmental Code allows the Government to examine big infrastructural projects from sustainability criteria’s. The Environmental Code can be used to secure national interests, geographical planning guidelines as well as finding out whether there are conflicts between different goals or laws within the Environmental Code. (Hilding-Rydevik & C. Fundingsland, 2005)

The Planning and Building Act was introduced in 1987 and regulates building and changes in land use. It states the demands for permits in detailed planning, building permits, and compensation for expropriation and more. The Planning and Building Act regulates the comprehensive planning and the municipal planning monopoly for land- and water-use. (PBL 1987:10)

The comprehensive plan has three major functions, guidance for the municipal spatial development, base for decision making a forum for the dialogue between the government and the municipal in for example development in areas of national importance. The detailed plan is legally binding despite the comprehensive plan. The detailed plan is the most important instrument for implementing spatial intentions stated in the comprehensive plan. The plans include a limited implementation period under which the plan should be realised. The detailed plan also regulates the relations between municipalities and land-owners. (European Commission, 2000)

The conflicts between the Environmental Code and the Planning and Building act are strong. One of the most evident is the municipal veto in the planning monopoly, if the municipal does not allow a project; it’s very hard to proceed. The veto can in theory only be overruled by the Government in projects of national importance. (Hilding-Rydevik & C. Fundingsland, 2005)

Fig 2. Basic principles of the Environmental Code:

- **Polluter Pays Principle** – those who run or have run a company and thereby caused environmental damage are responsible to pay for the damage.
- **Precautionary Principle** – measures of precaution shall be made if a project can harm the health or environment.
- **Demand of knowledge** – describes the obligation to retain relevant knowledge in order to avoid environmental damage and the demand for Best Available Technique (BAT)
- **Localisation Principle** – all sorts of actions should be localised to an area which concerns as little affect as possible for human health and for the environment
- **Principle of ecocycling** – raw materials and energy and favour recycling
- **Balancing Principle** – balance assessment between precautions against cost.

Environmental Code chapter 1 and 2 (SFS 1998:808)

1.4.3 Environmental Quality Objectives

The concept of Environmental Quality Objectives was presented by the former Swedish government. EQO includes 16 different target areas. There are two kinds of EQO visionary and measurable. All EQO has part time goals and subgoals to measure the development. The EQO aims to provide a sustainable structure of the society by 2020. (Johansson, 1997)

Fig 3. The Environmental Quality Objectives and the responsible institutions

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Institution</th>
</tr>
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<tbody>
<tr>
<td>1. Reduced climate impact</td>
<td>Swedish Environmental Protection Agency</td>
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<tr>
<td>2. Clean air</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>3. Natural acidification only</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>4. A non-toxic environment</td>
<td>Swedish Chemicals Agency</td>
</tr>
<tr>
<td>5. A protective ozone layer</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>Environmental Objective</td>
<td>Responsible Authority</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>6. A safe radiation environment</td>
<td>Swedish Radiation Protection Authority</td>
</tr>
<tr>
<td>7. Zero eutrophication</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>8. Flourishing lakes and streams</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>9. Good-quality groundwater</td>
<td>Geological Survey of Sweden</td>
</tr>
<tr>
<td>10. A balanced marine environment, flourishing coastal areas and archipelagos</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>11. Thriving wetlands</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>12. Sustainable forests</td>
<td>Swedish Forest Agency</td>
</tr>
<tr>
<td>13. A varied agricultural landscape</td>
<td>Swedish Board of Agriculture</td>
</tr>
<tr>
<td>14. A magnificent mountain landscape</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>15. A good built environment</td>
<td>National Board of Housing, Building and Planning</td>
</tr>
<tr>
<td>16. A rich diversity of plant and animal life</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
</tbody>
</table>

(Naturvårdsverket, 2007a p89)

The Swedish Environmental Protection Agency (SEPA) is responsible for the implementation of the EQO. There is an ongoing discussion about the role of EQG, because of the vague description of the aim with EQO and that the vague description status, it creates a difficult framework with weak boundaries. The measurable EQO uses different indicators as guidance for decision-making. The problem is that the regional implementation can be difficult, the EQO are formulated on the national level and are regionalised by the County Administrative Board. However, the connections with the national level are weak and weighting regional decisions to the national EQO framework can be difficult. (Naturvårdsverket, 2007a)

The Swedish Environmental Objectives Council writes in the report Sweden’s Environmental Report de facto 2007, that the environmental quality objectives will be hard to reach within the given timeframe. The report is based on the process of implementing the 16 environmental quality goals and 72 subgoals. 8 of the 16 environmental quality goals are judged not to be reached, and 1 needs additional efforts to succeed within the timeframe. Reduced Climate Impact, Clean Air and Natural Acidification Only are all quality goals that are judged not to be reached. All these quality goals are connected to transportation. (Naturvårdsverket, 2007a)

The increasing road transportation is a big problem for the achievement of the environmental quality objectives. Heavy traffic is increasing every year and the limits set in the Kyoto-protocol to decrease the emissions to 1990 years level is exceeded by 11%. When talking about the problems of freight transportation the road traffic is the scapegoat, but transportation by sea shipping industry is the biggest contributor of sulphur emissions of all sectors in Sweden. (Naturvårdsverket, 2007a)
2. Theoretical perspectives

2.1 Introduction
The development of the Fourth City Region can be described and analysed by many different theoretical frameworks; Triple Helix, Innovative Regions, Regional Growth Poles, Polycentric development are just a few to be mentioned. Because of the multilevel development that regional development includes, there is hard to frame one theory that is possible to apply for the whole project. However, regional development is connected to different growth theories. According to The Swedish Institute for Growth Policy Studies, ITPS (2008) are most of the growth theories concerning growth measured by GDP. Increasing labour market and economy is the main indicators for development. Innovation and growth are considered as key elements of regional development and therefore.

2.2 Regional Growth Poles
The development of the twin-cities Linköping and Norrköping towards a single city region, will affect the surrounding areas in many different ways. The both cities are the dominating urban areas in Östergötland with a history of urbanisation. François Perroux introduced a concept of Growth Poles in 1949. In this concept Perroux defines a growth pole as an abstract economic space. A spontaneous thought would probably be to analyse the concept of growth poles by its structure, a dominant industry or a high-tech cluster. Perroux argued that a dominant position is important for the concept and for certain that a big industry or cluster would have big effects on the economy and interaction. The idea of dominancy is according to Perroux basically supporting the idea that a dominant company demands a certain flow of goods. This flow of goods is more efficient if the direction is from a smaller company to the dominant company rather than the opposite. Perroux argues that there are strong forces of agglomeration in a Growth Pole and that this development is dependent on linkages to other external actors. A big company needs its suppliers, infrastructure for transporting goods but on the other hand it also creates a good climate for entrepreneurs. In many ways Perroux gives the policy makers space for their own interpretations. The growth pole theory refers to agglomeration of industries and the catalyst effects it creates for economical development. Perroux argues that geography does not matter in the concept of growth poles but the agglomeration and concentration of industries in an area is always in a way dependent on geographical factors. (Fjärde Storstadsregionen, 2003; Edington, 2001; Konstadakopoulos, 2004)

Perroux main idea with in the Growth Pole theory was that by focusing the economic activity to limited number urban centres in a region, these will according to the concept of spread effects provide an economic climate for growth for the surrounding areas. The Growth Pole theory will lead to geographical disparities in the region. Perroux however, argues that the wealth will trickle down to the weaker surrounding areas. According to Edington (2001) is Perroux criticised for the results from the practical implementation of his ideas in South America. The problem where that the allocation of the economical means became political rather than rational. The Growth Pole theory is according to Edington popular as a policy tool for regional development. Other economical theories support the concept of a strong regional centre that will provide spread effects. There are however problems to apply Perroux ideas to the planned polycentric structure that is proposed in the fourth city region. The main idea with the polycentric is a number of urban centres connected to each other by a high capacity transport corridor. The question is if a polycentric structure can benefit and function as one
According to Bachter & Polverari (2007) is the Growth Pole theory commonly adopted in both EU10 and the new member states in the European Union. From a national economy perspective is it better if the capital area isn’t the single growth engine in the country. The polycentric vision of many member states in the European Union includes the idea of important new growth engines spread across the country. Bachter & Polverari argues that the support of city areas with growth potential, are not the goal itself but for the effects that they create for the surrounding areas. Konstadakopulos (2004), states that, the ideas of the importance of Growth Poles can be noticed in the European Union concept of polycentricty. Perroux ideas have influenced the development of the European Community’s regional development perspectives. The connections between the Growth Pole theory and polycentric development can be noticed on the European level and following the European Spatial Development Perspective ESDP, it seems that it comes down to which scale the theories can be used and to political rhetoric’s.

2.3 Management and planning an uncertain future
Regional development and the process to develop a city region include high levels of uncertainty. External actors can not be forced to act in the way a plan or concept predicts. The future is unpredictable and it is hard to deal with uncertainty. Johansson (1997) argues that strategic plans should concern changing conditions and deal with genuine uncertainty such as oil prices. Difference in opinion affects the strategic plans and political intentions sets the agenda. The development of a fourth city region deals with uncertainty at different levels. Population growth, economic development and commuting are factors that are of great importance. There are however limits to growth, factors that can affect the conditions for the development.

The UN commission: Intergovernermental Panel for Climate Change (IPCC), presents reports based on scientific evidences and arguments about climate change. IPCC compile evidences in order to understand the risk of anthropocentric effects on the climate. The result of IPCCs work is presented in Assessment Reports. In 2007 presented IPCC its Fourth Assessment Report which shows scientific evidences that the human race is affecting the climate. IPCC argues for many different approaches towards the problems, but the main message is that the emissions of climate affecting gases need to be reduced rapidly. IPCC argues that: the levels of CO\textsubscript{2} need to be reduced by 50-85% based on 2000 levels by 2050. The figures are made at the global level a level where also fourth city region has an obligation. At the national level the aim is by the Kyoto-protocol to fulfil this and that. Building a region will in some way contribute to environmental effects. The problem is to solve the tendencies toward more unsustainable development. There has to be a rational and conscious perspective to take the right decisions. In order to take good decisions the importance to have discussions in a broad perspective can’t be neglected. An awareness of that sustainable development means different things to different persons is also important to take to account. (IPCC, 2007)

The European Environmental Agency discusses the development of greenhouse gases according to IPCC and the Kyoto protocol:
Since greenhouse gas emissions from transport have increased by around 23% since 1990, the reductions of emissions in other sectors of economic activity have to a large extent been offset. This now makes it difficult to meet the Kyoto targets. If, in the long run, the global temperature rise should be limited to a maximum of 2 °C, as agreed by the EU Council, the concentration of all greenhouse gases in the atmosphere must stabilise at a level no higher than about 550 ppm, corresponding to a \( \text{CO}_2 \) level of 450 ppm or perhaps even substantially lower. In 2005, the EU Environment Council concluded that in order to meet these targets developed countries would need to develop reduction pathways to allow a 15 to 30% reduction in emissions by 2020, and 60 to 80% by 2050. This would mean that transport, which presently emits around one fifth of all greenhouse gases, could end up using the entire emission quota by 2050 if no action is taken. (European Environment Agency, 2006 p9)

2.4 Sustainable development

The concept of sustainable development refers to a balanced development between, ecology, economy and social and cultural development. This concept is wide and hard to define in practical terms. The former Swedish Government stated that the strategic challenges to achieve sustainable regional development are based on: high quality of life for all citizens, good health, a clean environment and social security. These goals are expressed on the national level and shall influence all political decisions. The vision of sustainable development, presented in the report Strategic Challenges – Further Elaboration of the Swedish Strategy for Sustainable Development, can be described by the following words: long-term, sustainable, overall perspective, cooperation and participation. (Naturvårdsverket, 2006)

Sustainability can be defined and described in many ways but a good attitude towards the sustainability concept is a future state and a contemporary process. It is important to remember that sustainable development is a process dependent on complex connections. The UN commission for sustainable development defined sustainable development as; “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.” (UN, 1987) The foundation for the Our Common Future Definition is; a long time-frame, continuous processes of change, social and economical aspects in all decision making. Respect for ecological limitations, new models of growth and justice between generations. Our common futures definition describes the needs for keeping within the long-term carrying capacity for the environment and does this without neglecting human rights, democracy and within economically reasonable limits. To achieve these goals great changes need to be done. Usage of natural resources and energy use needs to be decreased. Sustainability is dependent on social acceptance and economical development. (Gullberg et al 2007, pp17-49)

In the Swedish sustainable development policy can the following perception of sustainability be found:

*Mutual support of economical, social and environmental efforts shall be formulated to each others conditions. The integrated approach is founded in the insight of a good economy is the base for social justice and environmental protection. The opposite is also valid; what’s good for man and environment is good in the long-term for the economy.* (Swedish Government, 2005 p7) (Authors translation)
The complex structure of the modern society provides no end-solution for sustainable development. New technology, more efficient housing and engines are factors that affect the development in the society. New rules and legislation can decrease the usage of energy and natural resources. New life patterns and more general changes in society can also affect the development. Planning is connected to all these factors in different ways. Planning is a tool that should be used consciously in the process towards sustainability. The urban structures affect the life patterns of its inhabitants and therefore also the process. (Gullberg et al 2007, pp17-49)

### 2.4.1 Regional and sustainable development in Sweden

The government is responsible to set up the standard for the infrastructure in Sweden. The transport policy sets the framework for the sector authorities to plan their sector. The transport policy concerns harbours, railways, roads and airports. The objective with the transport policy is to support the public good. The planning method in the transport policy is founded in a predict and provide culture, where future economic activity, traffic volumes etc is included. Åhman (2004) argues that the timeframe and spatial effects for infrastructural projects that is planned based on these measurements, threatens to lock Sweden in an unsustainable system.

The metropolitan politics in Sweden is weak, but there are however a Government Bill; (1997:98:165) that focuses on development and justice in metropolitan areas. The report focuses mainly on to areas sustainable growth and integration and equality. The geographical area that is discussed is the three metropolitan areas, Stockholm, Gothenburg and Malmö.

The comprehensive objectives for the Swedish infrastructure and transport politics have the overall objectives to sustain an efficient and long-term sustainable transport system concerning national economics. These goals are formulated in the Government Bill: (2001/02:20). The main focus areas are; availability, high quality transports, road safety, a good environment, regional development and an equal transport system.

The Committee of Responsibility argues that the Swedish political perspective on regional development and economic policy is growth. Sustainability has been added recently to include social and equity dimensions, but there has been no fundamental change in order to be more sustainability argues The Committee of Responsibility. The sustainability concept has had restrictive effects for growth politics. (SOU 2007:13)

The predict and provide methods is often based on reaching a certain goal or scenario according to Åhman (2004). Scenarios are more and more often used in infrastructural projects and Åhman argues that the need for decreasing traffic is often missing. The timeframe and indirect effects is hard to approach in scenarios. There are other problems with scenarios; they are not integrated to the planning system.

### 2.4.2 European Unions perspectives on regional development and sustainability

Sustainable development has been debated on the European level for years. Since the Treaty of the European Union in 1999 has sustainability become an overall objective for the Union’s future development. The development of the European Union has been focusing on the social and economical development in the community. The Lisbon agenda was strongly focusing on creating more and better jobs all over the union. As answer to the strict social and economical
development the European Council had a meeting in Gothenburg and adopted the European Union’s first strategy for sustainable development in 2001. The strategy started a process that strengthened the community aim to become a driving force in the world towards sustainable development. (Ministry of the Environment, 2006)

The development of the modern European Union rests upon the four freedoms formulated in the Single European Act, which were adopted in 1986. The four freedoms affects the politics in various fields. Transport politics and the Trans-European Network are founded in the idea of a Europe with the four freedoms. The four freedoms are as follow:

- Goods
- Capital
- People
- Services

(Leonard, 2005)

The increasing interest in the regional level and regional planning in Sweden is a result of the Swedish membership in the European Union. EU has a strong focus on the regional level in the structure of the region. The regional level is in the focus in the concepts of social and economic cohesion and coherence. ESDP focuses on regional planning with polycentricity as a basic concept. (European Commission, 1999; 2007)

In 2001 EU presented the White paper for the period until 2010 which aimed to decouple transports from the economic growth. Historically has economic growth and increasing transportation been synonymous. Increasing scientific evidence for the threats from CO$_2$ emissions, climate change and higher oil prices led to this document. In the report the main idea is efficiency, new technology, non-carbon fuels and less transport dependent economic growth. In the program there are 60 different bullet points. The main issues among these bullet points are; inclusion of external costs, increase competition between different modes of transportation, intermodality, private partnerships, security and quality in public transports, taxes and fees and so on. (European Commission, 2006; Åhman, 2004)

According to EU is the biggest problems in the infrastructure sector; traffic congestion, missing links, unequal dispersion of transports, financing new infrastructure, environmental damages and public health. EU states in the White Paper that efforts shall be put in the development of rail and transports on water, more efficient usage of existing infrastructure, strengthening accessibility to peripheral areas by harmonising and developing railroad systems all over Europe. There is also focus on development of laws and norms to increase cooperation between different member states and candidate countries. (European Commission, 2006)

### 2.5 Indicators

Indicators are more and more often used in spatial planning. Indicators usually provide a quantitative valuation that could be used for decision making. In environmental assessment procedures quantitative methods are favoured because that they do not contradict to economical valuation methods. A qualitative reasoning tends to have a lower value in valuation methods: example future generations against present needs. The process to choose indicators is important. The indicators shall traditionally be quantifiable to lower the risk of subjective assessment. The indicators shall be formulated so that the can be followed through the entire planning process. It is also important to have in mind the effects from the indicators;
they only present a small environmental effect in a big and complex system. The result that an indicator shows has to be discussed, there are no absolute truths and there are other factors that affect the end results. The indicators shall therefore be put in relation to the surrounding world. (Johansson, 1997)

The indicator which presents new housing close to public transportation doesn’t mean that the citizens will take the bus. But if it’s a combination between different controlling mechanisms it can lead to an increased use of public transports. The first level, the plan is often comprehensive and puts out the political intentions for land- and water-use. All the different tiers in Emmelin’s model have impacts for the actual result of the plan. And it is important to know what level of governing that the authorities have. Emmelin (2007) states that there are two different parts in his line of reasoning: The first part is about reporting and predicting the “project actions”. The second part is about transferring the actions to actual environmental effects.

2.5.1 Indicators of unsustainable development

The common way to use indicators is to present a measurable picture of development. In this study there is a slightly different approach, the indicators are used for discussion more than presenting measurable results. All the chosen indicators is important in order to reach a more sustainable structure in the Twin City project. Due to the limited time for the study is the indicators discussed on a more comprehensive level.

- Public transportation ratio
  The region is based on different concepts which all focuses on develop the region to one commuting region with one local labour market. Since the focus is to develop the functional core – two cities, 43 km apart is it vital to have a well functioning public transport system. Distance to bus stop, train station
- Freight transportation ratio
  Developing a region is almost synonymous with increasing freight transport. The effectiveness and mean of transportation is important in the process towards a more sustainable transport system.
- Car dependency

(After Emmelin, 2007)
Car dependency is an indicator of the transport system and the lack of suitable alternative transports. Cars/1000 inhabitants are an indicator used in official statistics.

- **Commuting (time, distance)**
  
  The commuting time differs between different means of transport; this affects the attractiveness and also the environmental effects. Timeframe 45-60 min

- **Combinations between different means of traffic**
  
  To compete with the advantages of the car, the public transportations system needs to focus on cooperation and localisation by supplementing effects in spatial structures.

- **Economic guiding mechanisms**
  
  Pricing of parking is an effective tool in order to reduce traffic.

- **Official indicators**
  
  - \(\text{CO}_2\)
  - Noise pollution
  - NOX
  - Particles PM10

### 2.6 Governance

The governance structure will affect the future of the Twin City project. The actors in the planning arena have to cooperate in different networks and discourses, the strategic approach: building a region presented further on in this study. The sociologist Anthony Giddens (1984) discusses the relations between systems and forces that affect the shaping of the society. In the area of physical planning Giddens argues that the strategic decisions made today or in the past affects the directions for future decisions. The strategic decision-making is dependent, in many ways, on the place and the local discourse. The decision-making is also dependent on the imagination and visualization of the planners. The opportunities for today’s planners are shaped by their precursors, but also by their possibilities to integrate new concepts. The individual can play an important role for planning.

Sustainable development is a rising concept in urban planning and regional development. Sustainable development can be described in many ways but one of the most common concepts of sustainable development is the balanced development presented in the UN report Our Common Future. (UN, 1987)

Giddens (1984) presented three different relations that are very important to consider in the book: *The Constitution of Society*. Giddens identifies these three levels of governance: the allocate structures that are dependent on labour-market, natural resources, infrastructure, finance and other investment processes. The second describes the structure of the authorities, legislation, planning-culture, and regulations such as environmental quality goals. The third and last one refers to the framework of planning and the interrelation between different goals and values that could be exemplified by the relations of the three parts of sustainability: environmental, economical and social sustainability.

"It is not a national duty to govern the regional process to actualize the vision of sustainable development. It’s the regional level that has the knowledge on which efforts and prioritisations that’s optimal to change unsustainable trends and structures and facilitate the process towards sustainability in each region.” (Ministry of Enterprises, Energy and Communications, 2007, p9) (Authors translation)

The formal hierarchical system in Sweden consists of three different levels; the national level with the government, national authorities, the regional level with municipal boards and the County Administrative board. The Local level is ruled by the municipal. (European Commission, 2000)
3. Picturing the present and future of a fourth city region

The importance of city regions has been a rising issue in regional structure and development. The benefit of regional development is influenced by regional growth and welfare theories. According to these, city regions attract businesses and increase the potential and possibilities to grow. Economical theories speak of regional development and attractiveness as something crucial for survival. (Tyréns, 2007)

The fourth city region is marketed as a metropolitan alternative, but is it? The Twin City project is at the moment a marketing project between the marketing offices in the two cities. One problem is the lack of definition; a development of two city centres or one city region is quite different. The project hasn’t reached an active planning phase, and is at the moment mostly political discussions and alignments. According to Östsam is one of the goals with the RDP to support the development of a fourth city region. It is important to remember that the development of a city region is depending on external actors and effects that the participators in the project can’t control. (Östsam, 2006a)

3.1 Prestudies
Östergötland and Linköping and Norrköping have been pointed out as an important region in Sweden because of its geographical position and level of infrastructure. The European Union has pointed out Norrköping as an important node of transportation in the TEN-T project the Nordic Triangle. The Swedish government has however because the lack of metropolitan politics not discussed the fourth city region from a city region perspective. The national support for the project is made by the sector authorities and the county administrative board directives. Norrköpingspakketet is however seen as a project of national importance, and is therefore funded partly by the Government. (Tyréns, 2007; Fjärde Storstadsregionen, 2003)

3.2 What defines a region?
The Twin City project is described by the municipal marketing offices as the cities Linköping and Norrköping and the towns and cities within commuting distance. The practical definition is the two cities and their local labour market areas. The argument for the rather vague definition is that a metropolitan area is defined by functionality and geographical vicinity. (Fjärde storstadsregionen, 2003)

There are two local labour market areas in the area described as the fourth city region. This causes administrative and statistical problems on the national level. The local labour market area definition is important, if the fourth city region gets recognised as a metropolitan area on the national level it could compete for infrastructural funds, previously only available for Stockholm, Gothenburg and Malmö. (Fjärde storstadsregionen, 2003)

The Swedish Agency for Economic and Regional Growth NUTEK (2006), has defined an alternative definition for regional development: Functional Labour Markets, which is based on the commuting patterns and does not concern juridical borders. However, the regional development is still dependent on geographical conditions and physical structures. Regional development and increasing commuting and transportation are often synonymous. One
important question to rise is which creates which. Florida (2006) argues that the increasing specialisation and increasing local economy are affected by external effect such as agglomeration effects, clusters and business climate. The Swedish Institute for Growth policy Studies, ITPS (2007), states that historical and geographical conditions still are important but since the importance of natural resources has lost its importance, as reason for localisation. ITPS arguments is founded on the idea of natural resources and their localisation, the importance of the idea that place matters in case of nearness to infrastructure, beautiful nature are still geographical conditions which attracts people.

According to Fjärde Storstadsregionen (2003) will Norrköping and Linköping constitute the functional centre in the fourth city region, there are other concepts but further on in this study is the concept fourth city region discussed from the perspective of Norrköping and Linköping as a city region, one metropolitan area.

### 3.3 Regional performance in the County of Östergötland

The regional performance in the fourth city region is statistically limited to the County of Östergötland or the two Local Labour Market areas. ITPS (2008) argues that either Linköping or Norrköping is in the top ranking in innovativeness, salary or unemployment. According to ITPS statistics is Linköping and Norrköping mid-performing cities. However, there are good preconditions with a university, big labour market, high-tech industries, good location and strong infrastructure.

Because of the lack of limitation for which area that is covered by the fourth city region is the discussion on the county level. Linköping and Norrköping is the dominating functional centre in Östergötland, with 137 636 and 124 642 inhabitants. The population in Östergötland shows a tendency for urbanisation. The positive population growth is concentrated to a linear structure from north-eastern to the central parts of the county of Östergötland. The population growth in Linköping is 1.0% or 1 217 persons and in Norrköping 1.3% or 1 787 persons. There are 89 urban areas in the County of Östergötland in total. Many of these have had a stagnating population for many years. According to Östsam (2006a) will the urban areas without good infrastructure or outside the commuting distance towards Linköping and Norrköping likely continue this development. The importance of good public transports has according to Östsam become more clear, the urban areas covered by commuter trains has increased commuting by 42%, the areas without these systems has had an increase by 29% during the period 1994-2003. (Östsam 2006a; Regionfakta, 2008)

Östergötland is the fourth biggest region in terms of population: 4,6% of the population in Sweden. The migration tendencies in the region are varied, but there is a distinctive pattern where towns outside of the immediate surrounding of the bigger cities are declining. (Östsam, 2006a)

Industry and commerce is represented by approximately 450 different types of businesses. According to Östsam is the development of new areas of businesses a key issue for regional development. Exchange of knowledge, services and goods is the key element for Östergötlands development in a national and global perspective. Östsam argues for strengthening the competitiveness for businesses in Östergötland in the RDP. (Östsam, 2006a, b)
3.4 Geographical conditions

The geographical conditions of the fourth city region and the County of Östergötland differ by the level of perspective. From an international or national level is the geographical position in Sweden good according to infrastructure, distance to other city regions and a good labour market. The European Union has highlighted Norrköping as an important intermodality node in the Nordic countries. By the TEN-T project the Nordic triangle, will Norrköping and the fourth city region strengthen its position as an area for transportation and freight traffic. (Fjärde Storstadsregionen, 2003)

On the regional or local scale is the development more diversified. The functional core of Linköping and Norrköping has good preconditions for growth by a developed system of infrastructure and is the economic growth engine in the region. Urban areas in the periphery of the County of Östergötland do not have those infrastructural transport systems. (NUTEK, 2006)

3.5 Infrastructure and transports

SIKA (2005) has made estimations for the personal- and freight-transportation by the year 2020 in Sweden. This study shows that the amount of transportation is estimated to increase rapidly. Freight transport will, according to the study increase by 21% and personal transportation by 27%. The base year for the estimations is 2001. The table below shows SIKAs predictions for the development for personal transportation.

Fig 5.

<table>
<thead>
<tr>
<th>Means of transportation</th>
<th>Increase by 2020</th>
<th>Increase of distance by 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>17 %</td>
<td>28 %</td>
</tr>
<tr>
<td>Air</td>
<td>41 %</td>
<td>39 %</td>
</tr>
<tr>
<td>Long distance trains</td>
<td>23 %</td>
<td>37 %</td>
</tr>
<tr>
<td>Long distance buses</td>
<td>7 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Short distance public transport</td>
<td>13 %</td>
<td>21 %</td>
</tr>
<tr>
<td>Walking, Cycling</td>
<td>1 %</td>
<td>5 %</td>
</tr>
</tbody>
</table>

(SIKA, 2005 p8)

There is always problematic when comparing different cities with uncertain geographical limitations. The table below shows the number of cars in the turn 2006/2007 in the city regions in Sweden. The fourth city region is represented by the numbers from the county of Östergötland. This is a bit problematic because of the difference in scale. The lack of definitions for the fourth city region makes it hard to present valuable statistics. However the table shows a significantly higher number of cars in Östergötland. The numbers are still below the national average but are still quite high. It is however important to remember that the numbers includes the peripheral parts of Östergötland and not only the municipalities of Norrköping and Linköping.

Fig 6. Number of cars per 1000 inhabitants in the metropolitan areas (SCB, 2006)

<table>
<thead>
<tr>
<th>Number of cars per 1000 inh.</th>
</tr>
</thead>
<tbody>
<tr>
<td>County of Östergötland</td>
</tr>
<tr>
<td>City of Stockholm</td>
</tr>
<tr>
<td>City of Gothenburg</td>
</tr>
<tr>
<td>City of Malmö</td>
</tr>
<tr>
<td>Sweden average</td>
</tr>
</tbody>
</table>
Investments in infrastructure affects the transport systems geographical transaction cost. With better infrastructure decreases the transaction costs for commuting and freight traffic. This has a direct effect for private and corporate economics and efficiency through lower costs, time efficiency and more reliant transportation. Lower geographical transaction costs increases the availability for companies to attract labour force and vice versa. The local area labour market increases if the geographical distance obstacles of time decreases which has positive affects on local economy. (NUTEK, 2007)

The Swedish Agency for Economic and Regional Growth NUTEK (2007) argues that investments in infrastructure affect local and regional economy in many ways. Lower transportation costs and increased market area increases political desire for regional growth. Recent studies have shown that a lagging investment ratio in infrastructure has severely decreased the economical performance in the three metropolitan areas in Sweden. NUTEK argues that lagging investments has created growing traffic combustion problems, increased pollution and a lower performing labour force market. In the study; *Hur mycket kostar det att vänta?* (What’s the cost of waiting?), is there however no discussion of external costs and sustainability. The study focuses on regional development from a strict economical perspective with focus on big scale traffic solutions. The study raises a very important question for the forth city region project; financing. Big scale projects like the railway connection Ostlänken is considered crucial for the development in the fourth city region, but is postponed by the government because of problems with financing.

During the last 20 year period has the amount of freight traffic increased rapidly. The amount of imported goods has increased by 55% and the export has increased by 59%. According to SIKA’s prognoses will the amount of goods in tonnes increase by 17% until 2020. (SIKA, 2005)

**Fig 7. The infrastructural system in the County of Östergötland: Railway and Roads**

(Östsam, 2002 p5)
3.6 Polycentric development

The division of the functional labour markets are based on an average commuting flow at a given moment. One third of the entire labour market in Sweden commutes over at least one municipal border. In the fourth city region are the major commuting areas for Linköping is; Norrköping, Mjölby, Motala and Åtvidaberg and for Norrköping; Söderköping, Linköping, Finspång and Valdemarsvik. Östlänken will cover the corridor from Mjölby-Linköping-Norrköping. Åtvidaberg and Motala are also covered by a railway connection. The highest exchange of commuters is between Norrköping and Linköping. The commuting time to Stockholm Central Station from the Twin City region is referred to as important for the development in Östergötland. The statistics say that during the time 2001-2006 there where approximate 1.3% of the labour force in Norrköping as well as in Linköping that commute to Stockholm. (ITPS, 2008; SCB, 2006a,b)

Commuting appears to be a core issue in building a fourth city region, the idea of a common local labour market area leads unavoidable to more commuting. Östlänken is presented as the key for this development and will increase the capacity of the public transportation system. However, research has shown that, when the capacity and efficiency of the public transportation network is developed, it only changes small numbers of commuters from the car to public transportation. The biggest increase in case of travellers is new commuters. (Boverket, 2005)

**Fig 8. Time and distance for commuting by car and train**

![Time and distance for commuting by car and train](image)

<table>
<thead>
<tr>
<th>45 minutes by train from Linköping and Norrköping</th>
<th>45 minutes by car from Linköping and Norrköping</th>
</tr>
</thead>
</table>

(Östsam 2002 p15)

The pictures express the situation in 2002, but they are interesting as base for discussing sustainable regional development. The time perspective is a very important factor in commuting. 45 minutes is seen as a limit for commuting. The figures above show a picture of Östergötland which expresses the limited area that could benefit from the railway system. The polycentric region has its winners and losers. The idea with the polycentric structure is the rapid transportation network between different urban cores these cores that are to be developed is those connected to the railway or other high capacity transportation systems. An area without these connections will probably suffer from this handicap. There are 13
municipalities in the county of Östergötland, not all of them have the same opportunities to take part of the Twin Cities project and the agglomerative effects. These are questions that have to be discussed very seriously on the regional level. (Östsam, 2002)

3.7 Main actors in the fourth city region
The Twin City project is governed by the cities Norrköping and Linköping together with the regional office Östsam. The Regional body Östsam has the obligation to work for regional development. Östsam shall co-ordinate the different actors on the regional arena and work for wealth and development in the region. The planning system gives the municipalities great amounts of governance and a planning monopoly. The regional council cannot interfere with municipal comprehensive planning directly and has to cooperate on unequal terms with the municipal political board. The regional office has obligations to the Government to regional development programs, regional transport programs and also cooperates with different regional offices in common planning issues. (Östsam, 2008)

The County Administrative Board in Östergötland is one of the 21 County Administrative Boards the Government has as representatives on the regional level. The County Administrative Board has a key role in the Swedish system; they coordinate municipal authorities, national authorities with central governmental issues. The County Administrative Board is responsible for fulfilling national targets, set targets for regional development, monitor environmental development and monitor the process towards sustainable development. The fields of responsibility are extensive and cover issues from landscape planning and rural development to administrate EU-projects. (County Administrative Board, 2006)

The governance structure in the fourth city region project is different to the formal hierarchical structure. The Twin City project will in the active phase be cooperation between the cities of Norrköping and Linköping and the regional office Östsam. The municipalities represent the local perspective and Östsam represents the regional level covering the County of Östergötland. To run a project on different hierarchical levels implies many interesting opportunities and some problems as well. When talking of political mandate, Östsam has the commission to work for the development of the whole region while the municipalities can concentrate on the city structure. This can be problematic in the limitation of the project. The fourth city region includes in many ways regional development as building a new city region. In this sense is a close cooperation with Östsam crucial for the municipalities. Östsam is also a good forum to discuss mutual comprehensive structure problem. (Östsam, 2006a) Swedish infrastructure and transport authorities are divided by sector responsibilities. The four means are all represented to different extent. The national authority that affects the development in the fourth city region is: the National Road Administration, National Railroad Administration, Swedish Maritime Administration and the Swedish Civil Aviation Authority.

The Swedish Government breaks down the overall transport policy into the following goals:
- An accessible transport system
- High transport quality standards
- Safe transport
- A good environment
- Favourable regional development
- A transport system that is managed by and serves the interests of women and men equally (Swedish Government, 2008)
3.8 Conclusion

The conclusion that could be drawn from the structuring part of the project is that there is a lack of alignment when it comes to positioning. The perspectives differ from regional growth to growth pole alignments. The result from the lack of consistency for the core structure of the project could weaken the results, when it comes to infrastructural investments. If the investments doesn’t collaborate fully with the major goals of the projects the expected development may not be reached. The main actors of the project may have different agendas but the alignment of the project needs to be consistent. The cities of Norrköping and Linköping has the possibility to govern the project by the planning monopoly, but the regional level which is the forum for collaboration with the surrounding municipalities and the national level needs to share the visions and the main goal. Building a fourth city region with two strong cities needs a clear visions and goals. The interferences from the planning of the project through out the process to the actual development are crucial when it comes to develop a more sustainable structure.
4. The Regional Development Plan

According to the Governmental decree (2003:595) made by the Swedish Parliament about regional development shall the regional boards develop a Regional Development Plan. This plan is the foundation for future development in physical planning, labour-markets, housing, education and other welfare institutions. The Regional Development Plan should work as strategy for regional sustainable development, based on legislation and environmental policies. The RDP is a tool for implementing National sustainability goals at the regional level and concerns the key-questions for regional development. It is also a tool to increase the collaboration with the different stakeholders on national, regional and local levels. The Regional Office is responsible for the RDP. The RDP in force contains strategic regional goals, national goals and the prioritising and alignment for regional development. The plan is based on an analysis made from the preconditions and potential for development in the county. RDP concerns not only the county itself but to neighbouring counties and cross-border cooperation. The RDP also presents favourable areas and urban corridors for development in the region.

The regional office Östsam approved the Regional Development Plan Östgötaregionen 2020 in April 2006. The RDP frames the political ambition for the regional development in Östergötland for the period until 2020 (Östsam, 2006a).

The main objective/areas in the Regional Development Plan are:
- Arts & Culture
- Business Development
- Communications and infrastructure
- Lifelong Learning
- Employability
- Development of the rural areas
- Development of a city region

(Östsam, 2006a)

4.1 Local labour market area and regional planning

The concept of regional development is highly dependent of the labour market. The local labour market can by regional development, merge with neighbouring municipalities into a common labour market region. One of the aims presented in the Twin Cities project which is also emphasized in the RDP is a need for one local labour market area in Östergötland. The present situation is based on two different labour market areas, Linköping and Norrköping. By creating a bigger local labour market the region will increase its competitiveness because of the bigger labour force. The bigger labour market is however dependent on commuters over municipal borders. Because of the increased local labour market the pressure raises the transport system, with demands on higher capacity, time-effectiveness and robust structure.

(SIKA, 2007, Östsam 2006a)

The Linköping Local labour market area contains the municipalities of: Boxholm, Kinda, Mjölby, Motala, Åtvidaberg and Ödeshög. The Local labour market of Norrköping contains the municipalites of: Finspång, Söderköping and Valdemarsvik. The municipality of Ydre and Vadstena, which belongs to the County of Östergötland and belongs to the Regional Office.
Östsam, is not included in the two local labour market areas of Östergötland. The different definition of different statistics makes it harder to conclude the real status of the county Östergötland and particularly the development of a fourth city region. (Östsam, 2005)

The RDP is a basis for the discussion between the regional and national level about regional development. The regional office establishes its purpose and goals and works for sectoral corporation between all three levels. The RDP has to contain a strategy how to reach national goals and which areas in the region that shall be concentrated on. RDP is based on previous investigations for development potential. The program shall also relate to the regional border crossing corporation with surrounding regions and focus on functional collaboration. (The Ministry of Enterprise, Energy and Communications, 2007)

The Commission of Responsibility argues in the proposition SOU 2007:13 that the labour market politics is crucial for the regional development. The Labour Market politics has according to The Commission of Responsibility much bigger influence than the regional politics because of the exceeding financial powers.

4.2 First steps towards a Fourth City Region

The Regional Development Plan Östgötaregionen 2020 focuses on the development perspective for the whole region more than building a fourth city region. Östsam presents its concerns over the development where the national government and EU affect the situation in the region. The big infrastructural projects are of course extremely important but there could be much done on the local/regional level for the development of the fourth city region. The Nordic Triangle with Norrköpingspaketet, the high-speed railway Ostlänken and later on the high-speed railway-connection Götalandsbanan will have big effects for the region. Tyréns believes that the regional development process should focus on the perspective of a fourth city region and take actions and invest more money in this process. Tyréns states that there is a need of bigger risk-taking, both political and economical to succeed in building a new city region. (Östsam 2006a, Tyréns, 2007)

Östsam approved the RDP in the spring of 2006. The role and purpose for the RDP is to predict the development of Östergötland until 2020. RDP does not concern municipal comprehensive planning and the role of comprehensive plans is only taken into consideration in the regional planning. The division of the planning system where comprehensive plans only is taken into consideration is based on the decree of sector responsibility with a strong municipal planning office. Because of the weak connections between the regional planning and the comprehensive planning the regional plans tend to be abstract, the goals and strategies is not very sharply defined. (Östsam 2006a, Tyréns, 2007)

Tyréns (2007) argues that the weak connections between municipal comprehensive planning and regional planning will not favour the plans of building a fourth city region. Tyréns states that a better forum for cooperation is needed and that the system as it works today does not support the basic idea of the ESDP. The process of building a new city region needs a regional overall perspective that keeps the development together argues Tyréns. The weak role of the RDP where other institutions are responsible for implementation is also seen as a problem.
4.3 Infrastructure and Transport

The structure of the transport system is crucial for the availability to reach working places and develop the Local Labour Market area. The public transportation network and schedule should be important factors for localization of new housing areas and new industrial areas. When travelling time exceed 15 minutes the resistance increases, most commuters accept travel time during the time span of 15-50 minutes for travelling over municipal borders within the same labour market area. The problems in planning public transportation systems are the competition against the car. In a private car, with the same amount of time 15-50 minutes, the covered area is significantly bigger. To decrease the usage of the car for commuting, the planning in the community has to focus on strengthening the public transportation network. (Östsam, 2006a)

The definition of commuters is people living in one municipality and working in another. 21% of the labour force in Östergötland can be defined as commuters (average in Sweden 30%). Comparing to other areas has Östergötland lower amounts of commuters. All chief towns except Österbymo in the municipality of Ydre can be reached within 45-50 minutes by car today. All municipalities connected to commuter train lines have had an increased amount of commuters by 42% during the period 1994-2003. In other areas has the increased amount of commuters been 29%. There are two distinct destinations for commuters in Östergötland Norrköping and Linköping. Söderköping is the biggest net contributor for commuting in the region. (Östsam, 2006a)

According to Östsam (2006a) is commuting a key element for regional development. The commuters can find an attractive company to work for, and the companies are connected to a bigger labour force. Building a “round” region with a polycentric structure will increase the overall competitiveness for the region. The quality of the infrastructure is important for the economical development and a good transport system for freight traffic will increase the competitiveness for commerce and industry.

4.4 Environmental effects

The 16 environmental quality goals established by the Swedish government are connected to the RDP. The County Administrative Board has the main responsibility for the Environmental Quality Goals in the region. Together with the County Administrative Board has Östsam pointed out 3 focus areas for the next decade; eutrophication, agricultural issues and energy and transport issues. According to Östsam are the most parts of air pollutions from sources outside Östergötland. However, the areas around Linköping, Norrköping and the highways are the biggest contributors to air pollution in the region. The industrial sector in Östergötland has moderate emissions except from a few bigger plants outside Norrköping. In the RTP the role of population structure and the industry and commerce are pointed out as one key issue to handle pollution. (Östsam, 2007)

Östsam (Östsam, 2007a) states in the RDP that the document does not concern speculative assumptions such as rising oil-prices, climate change and a political collapse of the EU and further on. The reason for this is according to Östsam the high level of uncertainty. The contemporary factors are therefore limited to issues possible to assess by present knowledge and information. The factors concerned in the RDP are assessed with high probability and relevance to affect the region within the timeframe of the document 2020. The statement is in many ways interesting: rising oil prices and climate change are question that should be discussed even though the specific results are not known. It is interesting that oil prices and
climate change are excluded but prognoses of regional development in economy and population are not referred to as speculative. The RDP cannot cover all possible effects and outcomes, the spectra would be too wide to cover. The limitations need to be carried out and be discussed very carefully. Rising oil-prices as an example could seriously affect the outcome of the infrastructural planning in the RDP.

4.5 Conclusion

The Regional Development Plan constitutes the vision of the regional development. The development of a city region is one of the main areas that the plan is focusing on. The perspective is however formed by the political agenda of the 13 municipalities in the region. The development of the Twin City project is therefore one of many different agendas that the plan has to cover. The development of the structure of the region is based on many different ambitions. The development of the rural areas is an example of a possible contradiction. The development of the infrastructure of the transports system needs to correlate with municipal visions of the development of the area. In order to develop more sustainable means of transportation and public transportation systems the rural areas needs to develop knowingly to the need of creating a base of enough population density to admit public transportation lines. All rural areas can’t be covered by public transportation and should therefore focus on park and ride structures to support environmental efficient means of transportation. It is truly important to offer alternatives due to reduce the cumulative effects and interference between strategic planning and actual result.
5. The Regional Transport Plan

The purpose with a Regional Transport Plan is that it contributes to a strategic development perspective at a regional level. The joint discussion over the current situation and the needs of further development, possibilities and dependencies is the very base of the RTP. Infrastructure is vital for supporting and guiding desirable development by physical structures. By picturing the desirable future plans can be made through discussions considering which development would strengthen the region in the best way. The desired polycentric regional structure raises the question about the roles of the periphery and urban centres. The regional transport system has an important role for the development in the region and therefore shall concern the overall development tendencies. (Östsam, 2004, Östam, 2006a)

The Regional Office Östsam is responsible for the Regional Transport Plan and develops it in cooperation with the National Road Authority, The County Administrative Board and the concerned municipalities. The RTP during the period 2004-2015 has a budget of 1195 million Skr. The projects in the plan are divided into three different levels: long planned, long prepared and long discussed. These perspectives are stated in the planning directives for the RTP. Infrastructure of the kind presented in the RTP is costly and the prepared project shall according to the planning directives, be carried through. The projects can only be stopped if there is considerably strong evidence for inappropriate development as a result of the project. The RTP is however a tool for regional development and does not have purpose to fulfil by itself. The objectives and frameworks are exceptionally important for the RTP because of the long-term development perspective that it represents. The slowness in the planning because of the magnitude of the projects, the costs for the investigations and projection, and the cost for building the actual project, puts a high pressure for good budgeting. (Östsam, 2004)

The projects in the current Regional Transport Plan are mostly upgrading the existing road network in order to increase capacity, traffic safety, avoiding unnecessary noise pollution and environmental improvements. The projects are often expensive and the planning times are often 10 years or more. The plans are judged by different methods but the strongest instrument is a method called Cost-Benefit Analysis. The main focus in the RTP is as it seems to increase capacity, safety and time efficiency. However all the investigations and material behind the decisions is not available which will affect the results in the analysis. But there is no ongoing description or discussion on how the transport development will develop after the roads are finished. (Östsam, 2004)

5.1 Regional Development

Östsam (2006a), states in the Regional Development Plan that there is an ongoing development of a polycentric structure in Östergötland. The surrounding areas to Norrköping and Linköping have had an increased integration with increasing commuting. Östsam consider different types of urban development in Östergötland, the first: an increasing urbanisation with people moving into the metropolitan area. The second is an increasing integration of the surrounding areas with a polycentric structure. The polycentric structure needs however, a better infrastructure for commuters. Faludi (2002) argues, referring to the European Spatial Development Perspective ESDP that the polycentric development should be focused on strong transport corridors with high capacity for public transport. Faludi also argues that the polycentric development is an answer to many regional economical theories.
6.2 Commuting for regional growth?

According to the National Board of Housing, Building and Planning the commuters can be divided into two different groups: the first category, commuters to work has chosen to live on a other location than their work and thereby has to travel to work. The second category commuters for housing, today many people wants to continue to live at the same place even when the got a new job. This category commutes for the possibility to keep their home. According to many different studies made since the 1970s, show that people are willing to travel up to one hour to work. (Boverket, 2005)

Regional development and increasing levels of commuting are often, in theory, synonymous. Widening the Local Labour Market implies more commuting. However does the National Board of Housing, Building and Planning a statement that commuting can be negative economically for the citizens: the extra time for commuting and the costs for travelling could affect the benefits. The structure of the region and the transport system is very important for private economy. The planning for regional structure should concentrate on developing good public transport passages preferably with train according to National Board of Housing, Building and Planning. (Boverket, 2005)

The Swedish National Board of Housing, Building and Planning (2005) argues that the increasing commuting and increasing transportation of freight is not suitable for sustainable development. A good infrastructure for commuting will tempt people to live and work on different places. Even though they travel by public transport, the environmental effects still affect possibilities to reach sustainability. The problem with this development is according to Jansson (1996) that the transports system creates its own demand by supporting urban sprawl and suburbanisation. The transports are at the countryside is less adapted to the external costs than in the city centre.

The RTP is referred to as a tool for regional development and growth. The RTP can be justified by many reasons, such as road safety and environmental safeguarding. An economic benefit such as higher speed, shorter distances also motivates investments in the road infrastructure. Regional development needs more commuting and better infrastructure according to Östsam and other institutions such as National Board of Housing, Building and planning. As mentioned before are most of the projects in the RTP focused on fixing broken links and increase speed, capacity and road safety. The RTP is seen as a requisite for the regional development, but when looking into the estimated results of the different projects they do not seem to increase the capacity of the infrastructural system. Most of the projects in the RTP have the same estimated amount of traffic after the project is finalised as before. One question that can be raised is: can the RTP be motivated by regional development if it does not concern increased amounts of traffic? (Östsam, 2004; 2006a)

According to the Regional Office Östams judging of the RTP, will the plan have the following environmental effects:

*Implementing the Regional Transport Plan for the current planning period, will influence a minor part of the total road network and therefore have a limited impact for the environmental effects from road traffic. An assembled assessment shows that the environmental effects from the plan, in total can be considered as positive.* (Östsam, 2004 p11) (Authors translation)
5.5 Conclusion
The Regional Transport Plan needs to be concentrated on its actual purpose: being a tool to reach and achieve regional and strategic goals. The long time planning and high amounts of public investments needs careful strategic decisions. The “new” planning perspective of sustainability and regional development should be a base for reconsidering all new investments. The results from fixing broken links and lack of capacity should be connected to the perspectives of reaching goals of sustainability and environmental goals. Long planned and long investigated projects has no value by itself but he structure will, if the project is implemented affect the transport system for decades.
6. Comprehensive Plan for the City of Linköping

The City of Linköping has made two important studies for the future development of the city; Future Planning Structures for Linköping (Framtida Planstrukturer i Linköping, 2003) and focus for the continued comprehensive planning (Inriktning i det fortsatta översiktspanerarbetet, 2005). The present comprehensive plan of the covering the whole municipality of Linköping was adopted in 1998.

The report future planning structures for Linköping discussed three different development scenarios. Good local society, urban and regional growth and beautiful, central living and housing. The common perspective from the three scenarios was the vision of a future population of 200 000 inhabitants. The politicians decided that the scenario that was best suited for Linköping was to develop the city and the region. This scenario also supported the development of the Twin Cities project. The scenarios presents a future city with 200 000 inhabitants in a region with 500 000 inhabitants. The time limit for these scenarios is not set. However, the prognoses made by SCB shows a development with 155 000 inhabitants by 2025 and due to the numbers of exploitation in the comprehensive plan 11000-21000 new apartments needed in the future and 15 hectare is needed every year for commercial development. The establishments of further external shopping malls are discussed in the comprehensive plan. (Linköping, 2005)

In the 2005 alignment for the future planning structures where the focus set to develop Linköping from a polycentric structure. The municipal council stated that:

Regional growth and development of the city of Linköping is a condition for a positive economical development in the municipality and in the region. Regional development provides big advantages for the private citizen. (Thyréns, 2007)

Since the planning structures in 2005 has a detailed comprehensive plan for the city of Linköping been carried out. The comprehensive plan is now on consultation until august 29 2008 and will probably be adopted late fall 2009. The plan focuses on the spatial development issues such as; building in areas with good public transportation, improve the urban structures for pedestrians and cyclists, make the city structure denser, reduce speed limits inside the inner city ring and develop a new station area with capacity for the new high speed railway Ostlänken. (Linköpings kommun, 2008)

The local development framework for the comprehensive plan started of in the future planning structures report from 2005. The current predictions indicate that the population development will increase from today’s 140 000 to 170 000 inhabitants in 2030 in the municipality. With this development will the population in the city increase from 100 000 to 120 000 perhaps even 140 000 inhabitants. The main aims with the comprehensive plan are to develop an attractive and sustainable city. The intentions in the plan are to develop the city within its current limits by regeneration and densification. Zones close to rapid public transportation is in focus in this development. (Linköpings kommun, 2008)

One of the goals with the comprehensive plan is sustainable development. Linköping agrees upon the definition for sustainable development made by UN in the report Our Common Future. UN defined sustainability as a balanced development between ecological, economical
and social frameworks. In the comprehensive plan argues Linköping that the decisions and development of the city shall be done within the boundaries for ecological sustainability. (Linköping, 2008)

6.1 Traffic and Infrastructural planning

The infrastructural system and transport system should according to Linköping (2008) be planned with a coherent approach between traffic- and settlement planning. The main idea presented in the plan is that: A denser city provides the conditions for biking, walking and a rapid public transport system which is desirable. The current division between different means of traffic is: cars 57%, Public transport 12% and bicycle 31%. (Linköpings kommun, 2008)

The City of Linköping (2008) presents three different scenarios for the traffic development, one business as usual concept, one concept with small adjustments and the last one with big adjustments towards sustainability. The three scenarios considers a population of 120 000 with the timeframe 2030. The basic idea with the scenarios is to present a base for discussion for the future development. According to the scenarios will the first; business as usual increase the amount of traffic with 60%, the second one with small adjustments increase traffic with 30% and the last one with big adjustments will lead to development with the same amount of traffic as the starting year 2007.

The development in Linköping is highly dependent on national politics. Ostlänken is presumed to have significant impacts for the development of the city and region. According to the plan could the population development increase even more, because of Ostlänken. The polycentric concept can be notice throughout the consultation version of the plan with the focus on a denser and more contained urban structure with good public transportation. The polycentric concept is also noticed by the aim for development of the corridors along the railway on the regional level. Motala-Mjölby-Linköping-Norrköping is mentioned as the most important corridor but also along the railways Tjustbanan and Stångåbanan is development desired. (Linköpings kommun, 2008)

6.2 Twin City perspectives

Since the focus in the comprehensive plan is the development of the City of Linköping is there not much of the regional or Twin City perspective presented in the document. However is the plan to develop a common comprehensive plan with the City of Norrköping during 2009. The connections with Norrköping and the Twin City idea are distinct when it comes to commuting. Due to the high speed railway connection Ostlänken is both Norrköping and Linköping planning to build new travel centres which will stimulate and make commuting more attractive between the cities. The concept is according to the municipality to change the perspectives of the car as a mean of transport in the city area. (Linköpings kommun, 2008)

According to the City of Linköping (2008) will Linköping and Norrköping become a common Local Labour Market in 2010-2012 if the commuting continues to increase. The population development in Linköping is strong, for years has the population increased by 800-1000 persons a year. If the population development continues will the Cityof Linköping reach 150 000 inhabitants by 2016.

The comprehensive plan states that Linköping City airport will be developed with a general aviation centre and a new terminal building. Developing the Linköping City Airport and, at
the same time, developing the airport in Norrköping is remarkable. Are two airports with 43 km between needed? Ostlänken will, when it is finalised provide connections to the airports Skavsta (Nyköping) and Arlanda (Stockholm) within a rather short timeframe. The common comprehensive plan between Linköping and Norrköping needs to point out the directions for the development of the airports. (Tyréns, 2007; Fjärde Storstadsregionen, 2003; City of Linköping, 2008)

There is no formal SEA made for the comprehensive plan, this applies to the Planning and Building Act and the Environmental Act in force. The formal strategic assessment of the environmental effects from a comprehensive plan is according to Emmelin (2007) very hard to accomplish. Emmelin argues that it is very hard to try to predict concrete consequences from a comprehensive plan, because of the high level of uncertainty, assumption and reasoning concerning implementation. Instead of doing an SEA Emmelin argues that there are good reasons to concreting alternatives through different scenarios. EIA could however be used in the comprehensive planning process, if its focused on identifying environmental problems or conflict of interests or contribute to develop new guidelines for planning. (SFS 1987:10, SFS 1998:808, City of Linköping, 2008)

6.3 Conclusion
The ambition presented in the comprehensive plan is a big change in terms of transport planning. The planning of a new train station, a denser city structure, a change of division in means of transportation to allow a more sustainable development of the city is truly ambitious. The long term perspective of 200 000 inhabitants is based on the development of the Twin City project. The results of the planning done by the city is however dependent on the regional planning in terms of infrastructure. The vision of the transport system is dependent on how people chose to commute to the city and how the public transportation system develops in the polycentric structure in the region. The strategic national planning of Ostlänken is also crucial for the vision of the development of the city.
7. Norrköpingspaketet – The Nordic Triangle

Norrköping and The Port of Norrköping have been pointed out as an important transport node at international, national and regional levels. European Union points out that the harbour of Norrköping as one of the strategically important harbours in the Baltic Sea. European Union started the program Trans-European Network in 1992, the aim with this program was to strengthen Europe’s infrastructure in order to obtain social and economic cohesion. Northern Europe is one of the territorial handicapped regions in the peripheral of the Union. To strengthen the competitiveness and provide better, faster and more robust transport system the project Nordic Triangle was launched. The transport project the Nordic Triangle focuses on strengthens the transport network between Denmark, Sweden, Finland and Norway. In order to cope with the growing demand for better transport networks is the Nordic Triangle included in the Trans European Network (TEN-T). The Nordic Triangle is a combination of different transport modes – primarily road and railroad but also harbours for marine transports and airports. Nearly 80% of the industry and population in Sweden’s is connected to the project. In Norway and Finland almost 25% of the inhabitants are positioned in the area. (The Swedish Ministry for Industry, Employment and Communications, 2003; Norrköpings kommun, 2004; Williams, 1996)

By completing missing links and removing bottlenecks on our transport infrastructure, and enabling users to have a better choice of modes, the EU aims to make transport between Member States easier, thereby fostering free movement of people and goods in the internal market. Completing the network will help generate economic growth, better connect peripheral regions, and improve the quality of life of all European citizens. (European Commission, 2005 p73)

Norrköpingspaketet is an infrastructural program that aims to improve the situation for Norrköping as a transport node. In the program there are different projects in rail, road and harbour. More and better logistics is the main goal for the program and infrastructure has the focus to optimize the transport effectiveness. The port entrance is widened to handle bigger ships. The harbour in Norrköping is of strategically importance because of its depth; the harbour can handle big ships is connected to the main railway system in Sweden. The strategic area is also important because of the rather close distance to Stockholm which has problems with capacity in their harbour. (Norrköpings kommun, 2007a)

The main projects in Norrköpingspaketet is a railway connection from the harbour area Händelö to the trunk line, widened and deepened entrance fairway to the harbour, new roads connecting the harbour to the highways E4 and E22 and a connection to the road Rv51 which is a new road. At the same time is the harbour at Händelö, Pampushamnen, expanded with new piers and a combi-terminal for freight traffic. (Norrköpings kommun, 2007a)

The purpose with Norrköpingspaketet is according to the planning authorities to provide possibilities to change freight traffic from road to rail and sea. Another big issue is to decrease the pressure on the Stockholm-Mälardalen region. Norrköpingspaketet will also provide a possibility for future increase of the freight-transport by the Baltic Sea area. According to the planning document Norrköpingspaketet will the project solve many traffic problems in Norrköping by new circular roads. The planning authorities argue that Norrköpingspaketet is
an investment that matches local and national environmental quality goals. (Norrköpings kommun, 2007b)

At the local and regional level the Norrköpingspaketet will have big effects. The transports are predicted to grow both on the local/regional level and the national/international level. This will have effects on the local community and this has to be dealt with. Norrköpingspaketet focuses on to lead the traffic outside the city of Norrköping by building new circumferential route and railroad tracks. The increased activity in the harbour will have effects on the infrastructure in the whole region and as the focus is to provide good conditions to use rail and sea the railroad has to be strengthened. Norrköpingspaketet is focused on the freight traffic but there is also a focus on the connections between the four modes of transport for people; road, rail, sea and air. (Norrköpings kommun, 2007a,b)

Norrköpingspaketet is not a part of the comprehensive plan for the City of Norrköping, but has of course a impact for the development of the city. However, Norrköpingspaketet is developed by the County Administrative Board, Östsam, the national authorities for transportation and the City of Norrköping. The Nordic Triangle and the development of Norrköpingspaketet are seen as a key factor for the entire region. At the national level Norrköpingspaketet will be an alternative for freight traffic, to go by boat to Norrköping than unload in harbours in southern Sweden. Predictions show that in 2030 the Port of Norrköping will receive as much as 700 000 tonnes of goods. (City of Norrköping, 2007b; Thyréns, 2007)

The feasibility study for Norrköpingspaketet contained a Strategic Environmental Assessment where the social and economically benefits was pointed out as favourably for development. The SEA was made from a national as well as a local perspective and the result of that study showed that: it is profitable to invest in the project from all sustainability frameworks. In the SEA, sustainability is mentioned as an absolute necessarily and that the decisions have to be based on correct and long-term perspective investigations. Norrköpingspaketet is described as a project which can handle increasing freight traffic with maintained or improved environment. The project will allow the municipality to keep a margin to the environmental quality norms. According to the SEA there is room for development in all means of traffic in Norrköping. According to SEA will Norrköpingspaketet have limited environmental effects on the local level. All projects are placed in areas already under for environmental influence. All projects are based in areas planned for industry or infrastructure. The environmental effects for the different projects in Norrköpingspaketet will be investigated in separate EIAs. (City of Norrköping, 2007b)
8. Strategic planning and decision-making processes

Strategic planning is often, in Sweden, made on a non-binding level such as regional plans or comprehensive plans. One of the basic ideas with strategic planning is to present a political intention for development without legally binding decisions. The strategic plans have to consider multiple effects and needs and strengthen the overall objectives. In order to take the right decisions is different tools used. Prediction of the future development in terms of employment, economy, and technology are a few of the issues. In national economics there is always a need for balancing and weighting different projects against each other. All resources are limited and therefore are putting a value on different projects needed.

8.1 Mapping problem areas

There are several cities in Sweden that shares Norrköping and Linköping municipal ambitions for regional growth and there is a strong competition. Linköping and Norrköping compete with several cities in the same size over the same citizens. The trend of urbanisation which has been going on in Sweden for 30 years shows no signs of slowing down. (Tyréns, 2007)

There are 13 municipalities in Östergötland, with or without a focus on the process to develop a fourth city region. In this process there will be winners and losers. The idea of a polycentric structure will in a near future not include all areas in Östergötland which could create tensions on the regional level. The concept of seeing Linköping-Norrköping as a regional growth poles which will provide prosperity to all surrounding areas is probably a dream. The urbanisation process and changes in the population structure will probably increase the competition for the peripheral municipalities in case of new inhabitants. Östsam, 2002; Fjärde Storstadsregionen, 2003)

The focus seems to be to strengthen the whole region, the metropolitan area of Linköping and Norrköping are both assumed to grow and develop. According to statistic material presented by SCB and Östsam the development in many towns and rural peripheral areas will decrease, and has been decreasing for a long time. Sustainable development is a concept that can mean different things in different situations. Sustainability for a rural town can differ from a local to a regional context. Polycentric structure and building sustainable transport systems are often combined into the idea of developing strong transport corridors with rapid public transportation. Building a sustainable region will of course concern issues that the authorities can control. However, the infrastructure can benefit sustainable transportation by its structure.

Östsam in cooperation with SCB did a study of the travel and commuting habits in the county of Östergötland in 2005. In the study was 7500 people asked of their travelling and commuting habits. The study showed that the most common mean of transport for commuting to work was the car. At the countryside outside the urban areas is the car dominating with ¾ of the commuting traffic. Approximately 25 000 people are using public transportation for commuting. 9 of 10 of the people using public transportation are living in urban areas or in the cities. 8 of 10 are using the bus at least a part of the commuting, 3 of 10 are using trains. The different age structures of the population are significantly in terms of transportation. People in the age 26-39 are those who tend to commute by car the most. After the age of 40 is there a small tendency to choose to commute by bus. Road safety, travelling time and private health are the most important factors in choosing the mean of transportation. (Östsam, 2006b)
People living in the rural and urban areas, states that the car is the most attractive mean of transportation in case of public services. In the city area has the bike the same status. People living in rural and urban areas in Östergötland consider the central parts of Norrköping and Linköping as attractive for commuting by car. In Norrköping is the car the most attractive mean of transportation even for the citizens, its more attractive than the bike. (Östsam, 2006b)

### 8.1.1 Environmental- and transportation-goals and their effects on the fourth city region

According to the Kyoto-protocol that the Swedish government ratified may 16 2002, Sweden pledged to decrease the emissions of CO₂ to 1990 years levels by 2010. The Swedish agency NUTEK stated recently in an article in the Swedish newspaper DN that the Environmental Quality Objectives will not be reached within the given timeframe. (DN 2008)

It is important to remember the reason for that transports are needed. The environmental effects are connected to the development in the transport sector. The European Environmental Agency argues in the quota below that transportation and commuting has no value by itself:

> Transport is mostly a mean to an end, but transport users are locked into production and consumption patterns that are not easily changed in the short term, i.e. companies are located in certain places and need supplies, people need to go to work, children need to go to school etc. (EEA, 2006, p8)

Åhman 2004 argues for a shifting in attitude in transport planning and infrastructure. The projects implemented today will affect the society at least 50 years. Infrastructural and spatial planning in Sweden has been by the concept: “predict and provide”. The attitude in the RTP supports this argument: the projects in the RTP are mostly to increase the capacity, increase traffic security and decrease the commuting time. RTP is a tool for the RDP to promote the idea of polycentricity. There is no distinguishable discussion of decoupling the increasing need of transportation and regional development. (Östsam, 2004; Östsam, 2006a)

The driving forces behind the increasing demand for freight transport is based on the global market. The geographically dispersed production system creates a need for transportation. Freight transports gets more and more efficient and the emissions per tonne are decreasing. The problem is that the transports are more intense every year. Increasing costs for fuel, increasing internalisation for external costs and higher taxes will stimulate an even more efficient transport system. Alternatives like sea and rail will have a more important role in the freight traffic. Combi-terminals for reloading from different modes of transportation will have a big role in the process to make the system more efficient. The remaining problem is according to Åhman (2004) that despite all efforts in efficiency, the current trend of growing transportation has to be cut back.

Åhman (2004), states that the current way of planning which often aims to avoid bottle-necks in the transport system can not be deserted. Åhman argues that there is a need for improved efficiency, but these actions needs a long-term policy and new planning instruments. The common predict and provide concept of traffic problems is highly questioned according to Åhman. Due to harder environmental protection and land-use in the future could cause a increasing use existing road network and move some of the transports to hinterland roads.
This development would cause unpredictable results in environmental problems, congestion and road safety.

**Fig 9. Different tiers in transport politics**

(Adopted from Östsam, 2002 p7)

Healey (2007), states that the formal structure of the planning process has to be clearer in order to get an effective strategy-making organisation. The planners have to consider the political and intellectual challenges and think about new planning concepts in order to avoid old planning mistakes. The plans to build a polycentric structure in the forth city region have to consider strategic choices that will affect the sustainable development. The complexity in the planning process with both formal and informal decision-making in many different forums creates a need of know how and an awareness of decisions and their actual effects. Planning has to consider the environmental effects, social and economic development as well as the political consequences of the plans and policies.

There is an ongoing debate in Sweden about the role of the regional level. The Committee of Responsibilities did an investigation about the existing division in municipalities and counties. The debate concerns an increase of the intermunicipal co-ordination by a local government reform. There is an growing need for new forms of cooperation because of new travel and commuting patterns, bigger local labour markets and changes in where people wants to live and work. (SIKA, 2007)

### 8.2 Urban/Regional development frameworks

The three different planning perspectives that can be seen in the region leaves one big issue out of the debate; what will happen with the space between the twin city cores. The distance between Norrköping and Linköping is 43 km; this distance will not be developed in a near future. But the problem remains, the Twin City project aims to present the region as one. In the RDP is one of the aims to develop the County of Östergötland to a region in balance between urban areas and the surrounding areas. The development of a fourth city region will probably and accordingly to Perroux Growth Pole Theory, strengthens the urban area and the peripheral or surrounding areas benefit from the spill over effects.

Richard Florida (2006) argues that despite many urban/regional development theories, that infrastructure and the transport system don not attract companies by itself. Florida argues that the focus in planning should be mobility and thereby provide good conditions and a good
business climate. According to Florida are there different values than commuting distance and good possibilities to reach different parts of the region that attracts people. New values, new life patterns and the possibilities for personal development are more and more important.

Transportation and infrastructure has no end value in itself and should therefore be seen firstly as a tool for the people in the region, according to Florida (2006). Infrastructure and transportation is falsely seen as a creator of regional growth, it increases the possibilities to find a better job without moving because of the higher grade of specialisation. It also creates job in the transport and logistics sector. It is important to get a more diversified picture of transport system and its purposes. A bigger labour market increases the attractiveness of the region because of the chances to find skilled labour force; the bigger labour market doesn’t attract people by itself. Florida argues that new values attracts new companies, a city structure with interesting culture, attractive housing and milieu or just interesting people can be more interesting for establishment.

### 8.2.1 European Spatial Development Perspective

The European Union approved the European Spatial Development Perspective on an informal minister meeting in 1999. ESDP concerns the territorial development and focuses on spatial planning and regional development. The political vision for the ESDP is to develop a balanced and sustainable development for the community. The ESDP has no formal or legislative power and constitutes firstly a political framework for sector coordination. ESDP is strongly focused on the regional level and aims to be also a forum which makes regional cooperation over international and administrative levels possible. The ESDP document outlines three important areas for the territorial development in the community; infrastructure, urban structure and environmental and rural development. (SOU 2007:13, European Commission, 1999)

The polycentric region is characterised from a number of equivalent and competing cores. The polycentric cities are usually connected to each other by residential areas and labour market. The enlargement of a polycentric area tends to create new polycentric nodes outside the original city centre. These new cores are preferably connected with high capacity public transport or improving the road network. The polycentric development idea focuses on the possibilities to commute. The idea of the polycentric development is to connect urban centres, different urban cores with each other often around high capacity public transportation passages. The polycentric structure is favoured by the European Union in the document ESDP (European Spatial Development Perspective). (European Commission, 1999)

The ESDP (European Spatial Development Perspective) forms the European work in “planning with the goal of reducing regional and national differences in development conditions. It includes a combination of planning types that have previously been separated in Sweden: planning and regional policy measures. The term “spatial planning” does not yet have a good Swedish translation. European co-operation is pushing development forward in Sweden. Supported by different EU funds such as Interreg IIIIB, development work is taking place in several regions.” (European Commission, 1999)

The European Spatial Development Perspective is important for the development of a Fourth City Region in Sweden because it describes the alignment for European Union in terms of
funding infrastructural projects. The TEN-T program affects the possibilities to develop and strengthen Norrköping’s position in Sweden as well as in the Baltic Sea area.

The polycentric region improves the possibilities to commute to an attractive labour market and thereby find more and better jobs. Commuting increases the social and economic cohesion in the particular region and decreases the disparities. A polycentric structure can spread the wealth created in the growth pole in the region to a bigger area. The problem is the transport system. Commuting by train or other rapid public transportation like express buses is much more environmental friendly than taking a conventional car. The means of transportation gets more and more efficient every year and new more environmental vehicles is developed. The problem with cars is the transition time, the average Swedish car is used for 9,1 years and 9,5 years in the County of Östergötland and there are still problems defining criteria’s of environmental friendly cars. (Regionfakta, 2008)

It’s important to raise issues around conscious localisation of housing; according to The Swedish Agency for regional Growth, NUTEK (2006) is there a requirement for 2000 new apartments a year until 2011. European Commission (1999) argues that the connections between housing and infrastructural planning are important if the intentions are to build in a polycentric structure.

8.2.2 Mobility Management

Mobility Management is often referred to as “soft” planning and measures in persuasion. But the “persuasion” can take concrete turns in reducing traffic with traffic calming, restrictive policies against increased road capacity, lowering the parking policy norms and increased parking prices. The municipalities has the power to affect these issues and if the actions is taken simultaneously as the public transport system and biking lanes are strengthened the overall effects can reduce the amounts of necessary travels by car. It all comes down to create attractive alternatives to the car. The awareness of the urban structures effects on transportation is very important to remember, the dense city with a good structure of services, where the alternative means of transportation is prioritised is more attractive. The human being is a rational creature, rationality on the individual level not necessarily on the society level, which makes her decisions on time, comfort and pricing. Time is crucial for people commuting; it’s the door to door time, including time for changing transport means. (Gullberg et.al, 2007, pp 453-491)

The structure of the public transport system needs to focus on door to door planning. Concepts like “Bike and Ride” and “Park and Ride” gets more and more important, a concept that allows the commuters to take their bike to the train station or bus stop – perhaps also bring their bike. “Park and Ride” is a concept for people living in a sparsely populated area where the car is necessarily – they ride their car to the station and then take the public transport. The “Park and Ride” concept is important not only for the environment but also to decrease the pressure and traffic congestion in the city centres. A successful project in Lund, where commuters by Mobility Management changed the car for express buses, reduced the demand for parking lots in the city centre of Lund. (Lunds kommun, 2005) (Gullberg et.al, 2007, pp 453-491)

Approximately 10-20 % of the total city area is used for infrastructure: roads for person- and freight traffic. And one single parking-place uses 25-30m² in total (parking place + necessary road space). The importance of density is often mentioned when talking of concepts that are
used when talking of sustainable urban areas in polycentric structures. A dense city creates a possibility to have a high capacity public transportation network. (Lunds kommun, 2005)

### 8.3 Cumulative effects

Wärnbäck & Wallentinus (2007) discuss the cumulative effects from infrastructure and planning as a more or less unknown result in the projects. The cumulative effects are according to Wärnbäck & Wallentinus a result based on actions taken, in combination with earlier decisions. The cumulative effects works in two ways: additive or interactive. The additive adds the earlier problems with the new ones, the interactive can take out each other or amplify synergic ally. In regional planning the cumulative effects from new infrastructure, could by smaller projects like in the RTP, where the main focus is to fix broken links, lead to an uncontrolled increase of environmental problems. The cumulative effects can also according to Wärnbäck & Wallentinus, is a result through indirect effects such as exploitation in areas with improved connect ability. Exploitation and development takes time and the results from new infrastructure won’t show immediately, therefore is the timeframe and time overlapping crucial for judging cumulative effects.

The Swedish planning system suffers in terms of surveying cumulative effects because of the sector responsibility. In the project Norrköpingspaketet there are many different stakeholders; the City of Norrköping, the National Road Authority, the National Railroad Authority and the National Sea Authority to mention a few. The project is surveyed by the County Administrative Board in terms of environmental judgements. Norrköpingspaketet is presented as one infrastructural project but consists of many different parts. All projects within the Norrköpingspaketet have according to Swedish law, done an Environmental Impact Assessment (EIA). The problem is that the overall effect from the project is not presented; the cumulative effects. There is also a Strategic Environmental Assessment made, but the focus in this report is the national perspective, the local regional effects is discussed but not really taken into consideration. (Norrköpings kommun, 2007b)

The directions put out for development in Östergötland are often located to transport corridors. The problem is that the transport corridors are mainly by road. The development by rail is lagging behind the development of the road network. There are three main railroad projects in Östergötland: upgrading Tjusbanan to Åtvidaberg, upgrading the railroad to Motala-Hallsberg and Ostlänken to Nyköping-Stockholm. The upgrading of the roads in the Regional Transport Plan has been discussed and debated for years. If the projects would be stopped it would probably create a negative public opinion. These types of reaction will be discussed further on in this chapter. The long-term planning perspectives for infrastructure can have the implication that roads are built just because of the length of the project and pride. Many projects are of course important from many perspectives, strengthen local economy, road safety and environmental issues like noise and air pollution. The road by itself will not produce hazardous emissions, it will affect the landscape, be a barrier for animals and so on, but the problems are the vehicles. By upgrading all roads to 70-90km/h the environmental effects and psychological barriers towards public transport could increase. (Östsam, 2004; Östsam 2006a; Åhman, 2004)

The municipal planning monopoly is difficult to handle on the regional planning level, the peripheral municipalities in Östergötland has had a negative population growth for a long time. Upgrading road network and to some extend also the railroad, will probably provide the
opportunity for these municipalities to market themselves with cheap attractive housing. This development will in the long term affect the sustainable development in the region at many different levels. The peripheral municipalities are definitely eager to attract people for surviving, and people are interested in cheap and attractive housing. From an economical and to some extend also social perspectives of sustainability, this will be positive on both the local and regional level because of coherence. The problems with this development will create more commuters who need new types of services. Commuters are willing to spend up to 45 minutes each way on travelling, by 45 minutes they will cover almost the entire Östergötland by car. The idea of polycentric development is that it provides a base for good public transports, a development with more or less urban sprawl within commuting distance in Östergötland. This will affect the amounts of people that are able to choose public transport. Commuters will despite which form of transport affect the environment. The biggest problem is still, those who choose to commute by cars. (Östsam, 2002)

8.4 Monetary valuation
In the process to produce a base for decision-making in the projects Norrköpingspaketet and the RTP is cost-benefit analysis used. Cost Benefit Analysis is used to determine the social-economic benefits of an infrastructural project. The value presented in the analysis is a base for decision making and the higher positive values the higher benefits from the project. The Cost Benefit Analysis is based on the social-economic benefits divided by the total cost of the project (National Road Administration, 1997; Östsam, 2004; City of Norrköping 2007a)

The Cost-Benefit Analysis is important for correct decision-making and is often used as a tool in planning the transport sector in Sweden. Infrastructure is, as everything else, dependent on economy. Economy is all about prioritising, but the problem in planning is that it is impossible to put a price tag on everything. When planning for new infrastructure there has to a prioritising between many interests, time efficiency, noise pollution, environment, health and so on. CBA are used as a tool to investigate the effects of a plan or policy. The CBA puts numbers on a certain effects. The numbers has to be estimated and weighted to the other effects. The results of CBA are a structured picture of the results of a project or a plan. (National Road Administration, 1997)

According to the Swedish Agency for Economic and Regional Growth, NUTEK may the method of cost-benefit analysis provide a distorted picture of the most profitable investments in terms of infrastructure:

*The Cost Benefit Analysis gives a bad guidance for balancing road- and railroad infrastructure. This is concerning. I the light of rising prices on crude oil and demands for heavily reductions of CO₂ is the importance of finding a correct balance of investment in road and rail exceptional important. However, the differences in the costing method gives railroad almost automatically lower profitability than road. This can lead to a premature conclusion where roads are more of advantage for the society.*

(DN, 2008a) (Authors translation)

The weighting between different measurements that are used in the Cost-Benefit analysis is important to discuss in order to discuss infrastructural investments. The box below shows the environmental effects that the National Road Administration are using, which probably are used in Norrköpingspaketet and the RTP
SIKA the Swedish Institute for Transport and Communications Analysis has criticised the National Road Administration for the material presented in one of the biggest road projects going on in Sweden; the new highway called Förbifart Stockholm, a bypass road supposed to decrease the traffic situation in central Stockholm. SIKA argues that modern infrastructure must consider its effects on the climate and that the main focus should be to fulfil environmental quality goals, especially the ones concerning climate change. SIKA argues that the sectorisation shouldn’t affect the decision taking, and that the different transport administration should cooperate instead of competing. (DN, 2008b)

Other measurements and estimations can also affect the predictions in the plans and the reality. According to SIKA (2007b) are the government authorities for transportation using a value of 13.62 kr per litre petrol in their prognosis for the year 2020. SIKA argues that those prognoses are underestimating the possible increase of oil prices. According to a study made by SIKA with a petrol price of 25 kr will the regional commuting by car decrease by 28%, long distance travelling by car with 13%. Public transportation will accord to this study increase by 15 % and long distance travelling by train with 14%. The total difference between the transportation authorities and SIKAs calculations is -19% of the usage of roads. The results from this under estimations can affect regional development rapidly, cost effective solutions might not be profitable in social-economic terms.

Planning includes a high level of uncertainty because of predictions and assumptions. The importance of choosing good indicators can affect the outcome of a project or even the stop it. Östsam (2004) argues that it is of great importance to put the RTP in a strategic development perspective. The present conditions and needs should according to Östsam, be discussed in the perspective of the desired future development. When choosing to exclude rising oil-prices, climate change and refer to them as speculative assumptions without discussing them more profound, the desired improvement of the relationships between the periphery and central parts of Östergötland could be affected. (Östsam 2007a)

8.5 Environmental Assessment

Environmental Assessment is a way to systematise different choices. It should be able to view afterwards which alternatives that where eliminated and why. When the Environmental Code
where approved in 1999 the demands for environmental assessments where the demands raised. The environmental assessments aim to provide an assembled picture of the effects and correlations between the effects in a certain projects. The environmental assessment is public and the decisions and balancing made by planners and politicians is in order to sustain public participation saved for the future. (Johansson, 1997)

There are two major types of environmental assessments used in the Swedish planning system today; Environmental Impact Assessment (EIA) and Strategically Environmental Assessment. The different types of assessments are carried out in quite different contexts. The EIA is based on quantitative data and focuses in a product oriented way to optimise the project. EIA aims to give an objective analysis of the environmental impacts on nature, wildlife, landscape, water, air and so on. (Johansson, 1997)

The European Union directive 97/11/EC called the EIA directive where implemented, and came into force, in the Swedish Environmental Act in 1999. The SEA directive 2001/42/EC was implemented in 2004 in the Environmental Act. Both the directives were amalgated in the 6th chapter, EIA fully and SEA partly but mostly. The relationship between the both directives is complicated in the Swedish legislation. EIA is required in the Planning and Building Act in among others: the Roads Act, the Construction of Railways Act. These demands from the Planning and Building Act do not totally correspond to the formal general terms in the Environmental Acts. According to Sheate et al. (2005) is the process of the formal role of SEA not complete. Sheate et al. argues that in a few years will probably the requirements to carry through a formal SEA in Regional Transport Plans and municipal comprehensive plans.

In the fourth city region project is it important to understand the relationship between SEA and EIA. There is no formal demand for SEAs in Regional Transport Plans and municipal comprehensive plans at the moment. However could the European Commissions critique on the role of the Detailed Development Plan change the situation in the municipalities. The infrastructural project Norrköpingspaketet surveyed an SEA from a national perspective, but all the projects are investigated on the EIA level, in separate investigations. The cumulative effects and the neglecting of the significant environmental impacts from the separate projects and the national perspective on the SEA could affect the judgement of the County Administrative Board. (Sheate et al 2005, Norrköpings kommun, 2007b)

8.6 Environmental analysis
The development in the fourth city region can be described in many ways. This is a schematic view of the indicators presented in the second chapter and their effects from the different investigated plans. The approach to combine and explain these four very different plans with the same indicators are hard. The structure of the plans and the legislative power of the plans do not correlate. However, the plans will by their structure affect the development of the fourth city region. The plans are focusing on a wide spectrum of factors for development, these indicators shows the alignment that can be drawn from the plans. It is important to remember that the plans and the results of the plans often differs. The purpose with this schematic table is to provide a picture over a possible development.
The public transportation ratio and freight transportation ratio is increasing every year according to Östsam (2006a) and SIKA (2007b). The increasing public transportation ratio is positive from a environmental and sustainability view. However, according to Åhman (2004) is the increase due to new commuters rather than old ones switching mean of transport.

Freight transport is according to SIKA (2007b) estimated to increase rapidly. Norrköpingspaketet and the Port of Norrköping will accord the City of Norrköping (2007a) have a future capacity to handle 700 000 tonnes goods. The combi-terminal will allow transports by train but, the transports by trucks are estimated to grow. According to the SEA made on Norrköpingspaketet is there at the moment space to increase the capacity even more (Norrköpings kommun, 2007b). The Regional Development Plan and the Regional Transport Plan more or less have the predictions to provide the perspective to induce freight transport. The estimations are that freight transport will increase, this needs more capacity and will have positive effects for the regional development. (Östsam, 2004; Östsam, 2006a)

Commuting time will according to Östsam, (2004) decrease by fixing broken links. Infrastructural investments in the City of Linköping will also strengthen and increasing commuting. A new transport centre for public transports will increase the capacity for commuting by train and buses. This development is however dependent on national investments in projects like Ostlänken. Due to Östsam (2002) is the commuting time different between different means of traffic, in 45 minutes is almost the whole county covered by car, by train is the covered are significantly different.

Combinations between different means of transport are not a very big issue on the regional scale, on the local level: in the comprehensive plan of the City of Linköping (2008) is the concept more important. The development of combining different transports is however dependent on social structures, pricing and life patterns. Economic guiding mechanisms is only discussed in the comprehensive plan of the City of Linköping in terms of rising the fee for parking to get people to choose other means of transports.
The four official indicators are discussed in all the investigated plans. The City of Linköping has amendment policies and programs to deal with CO$_2$, regulations for Noise pollution, NOX and PM10. The indicators are also discussed profound in Norrköpingspaketet and the Regional Transport Plan. The focus is not that deep on environmental indicators in the Regional development Plan. The problems with these indicators is, that they are stated as positive when a road or is moved outside a dense populated area or when a road is constructed in an already developed area. The connections between different tiers in the planning hierarchy top-down and bottom-up seems to be weak. Since traffic is increasing every year according to SIKA (2007b), the bottle necks are taken care of and the focus is to increase commuting and increase the freight traffic in the fourth city region with projects like Norrköpingspaketet, is the probability that these indicators on a regional scale will decrease low. (Linköpings kommun, 2008; Östsam, 2004; Östsam, 2006a; Norrköpings kommun 2007a)

The Swedish Environmental Protection Agency states in a statement of opinion; that the national long-term planning on infrastructure for the period 2010-2019 contain problematic attitudes for obtaining environmental goals and international binding undertakings. SEPA argues that all new infrastructural projects should be concentrated on reducing environmental effects that causes climate change. SEPA argues that environmental assessments should be done already on the feasibility level. The National Administrations for Roads and Railroads has stated to be willing to do this; however the environmental assessments are according to SEPA, poorly made today. SEPA argues that the environmental assessment that is made today isn’t done according to the chapter 6 in the Environmental Code and the EIA decree. SEPA is of the opinion that the process of building new roads should be very restrictive as long as the overall picture of the environmental effects from road transports is surveyed. (Naturvårdsverket, 2007b)

8.7 Legitimacy for the project

At the moment are there no formal organisations or legislative binding documents in the Twin City project. The project will reach a more active phase when the common comprehensive plan the municipalities of Linköping and Norrköping starts. (City of Linköping, 2008)

Östsams role at the regional level is rather weak, the function is more or less a forum for discussing regional development; however the commission to establish Regional Development Plans and Regional Transport Plans amongst other plans strengthen the role of Östsam. The legislative power at the regional level is carried on by the County Administrative Board. The Committee of Responsibilities points out in the investigation SÖU 2007:13 that the legislative powers on the regional level should be strengthened in order to have a more efficient legislative system. (Östsam, 2006a; The County Administrative Board, 2006)

Johansson (1997) raises the question if there is enough competence of today’s planners. Spatial planning has historically focused on development of the physical environment, not the natural environment. Johansson argues that there could be a lack of competence in the planning process when the planners and politicians are facing the new planning situations and contexts. Emmelin (2007) also states that there is a need for new planning skills to meet the new demands. According to the Environmental Code, shall all infrastructural projects be assessed either by an EIA or an SEA (SFS 1998:808)
8.8 Remaining problems

The timeframe and urgency to react are discussed at all levels. The Regional Transport Plan and other infrastructural plans stretch over big timeframes with heavy investments. Östsm (2004) discusses in the RTP that the long term investigated projects will be built, because of the waste of capital the project would cause in the different investigations. The long transition times of the society will be even more fixed. Newman & Renworthy (1999) and Johansson (2004) discusses the long transition time in changing socio-technological- and infrastructural systems. To change the car dependency in today’s society great efforts are needed and it is important to show the dullness in the system. According to Johansson it takes 5-10 years to change institutional frameworks, 10-20 years to change technological components and it takes 20-40 years to change old systems or create new ones. (Johansson, 2004 p27)

The timeframe is not the only thing that threatens the infrastructural systems: according to the study made by the Swedish investigation on Climate Change and Vulnerability SOU 2007:60, is the infrastructural system threatened by climate change. The consequences for the road and railroad system are significant. Due to the estimated increased level of precipitation are many roads and railroads threatened by floods. The floods can harm the structure of the roads, railroads bridges and cause land slides. Increasing levels of storms threatens the electrified railroad tracks by falling timber. Increasing temperatures has effects on the constructions such as bridges, railroad tracks and embankments. Shipping and air traffic will not be exposed in the same way except for the changed weather conditions and some maintenance problems caused by these.

The main aim in the fourth city region is regional development and economic growth. Sustainable development is a concept amongst others that has to be weighted. The concept of sustainability is often formulated as a balanced development between economical, ecological and social values. The models in Appendix 1 show three different approaches to sustainability. Sustainability can mean many different things in all types of situations. There is a need of formulating binding documents for sustainability. The problems of climate change are not created on the global scale, it all comes down to the local scale. These are issues that have to be dealt with. The NIMBY phenomenon (‘not in my backyard’) will probably cause problems for the development in the urban areas in the fourth city region. A more dense structure, harder regulations for cars building new railways and light rail solutions will have opposition. This can cause problems politically; sustainable development will sooner or later affect the everyday life for the voters. The IPCC estimations to decrease CO$_2$ by 50-80% until 2050 will. (IPCC, 2007; Östsm, 2006a)

Emmelins five levels between policy and impact show the process and the influences on the way from plan to reality. A deviation from the policy or plan affects the results; small impacts can considerable change the end results. A plan or policy of comprehensive character states the intentions and alignments for the development. The cumulative effects from binding detailed development plans affect the end result of the comprehensive plans. (Emmelin, 2007)
9. Conclusion

Increasing commuting will increase pressure in the city region, who which already struggles with traffic flows. The effects of rising oil prices and climate changes are not considered in the Regional Development Plan and Regional Transport Plan. New technological solutions will take time, and there is dullness in the transition process, that can affect the regional development. The Swedish model of planning, with a focus on predict and provide has to deal with larger amounts of uncertainty. When planning the future of tomorrow, planners have to deal with large amounts of uncertainty, and needs to be at the scientific frontiers. Uncertainty is something that always has been around in planning: funding, migration, economic development and so on.

The four plans examined in this study are all concerning sustainability and environmental friendly attitudes, however the results of heavy investments in road infrastructure (even though its often to fix missing links and increase safety) will as Åhman (2004 p1) puts it that: "[...]
a continued growth of transport activity will make a future shift towards a sustainable transport system more and more unlikely despite new promising technologies."

Planning processes are a multilevel processes, the international and national agendas influences the regional and local level. Political decisions and decrees the national investments in infrastructure that on the regional and local scale, constitutes the framework for development. Ostlänken, the high speed railway connection to Stockholm is presented as a key factor for developing Linköping and Norrköping as key nodes in the fourth city region. The importance of connecting the two cities physically should be seen as a key factor for success for the project.

The Regional Development Plan, Regional Transport Plan, Norrköpingspaketet and the comprehensive plan for the City of Linköping, all mentioned in this study are all non-binding documents. According to Swedish law is there formal demand for making EIA or SEA over documents this type of strategic development. These assessments however seems to differ in terms of quality and perspectives. The Swedish planning system with municipal monopoly and sector responsibility makes it hard to analyse the cumulative effects from the plans. Developing a fourth city region as the planning documents vaguely advocates, will lead to an unsustainable regional development.

The focus area in Twin City project is Linköping and Norrköping, the surrounding areas should according to the polycentric development and the Growth Pole theory grew around good public transportation lines. However all municipalities over the county are interested in the positive development to maintain services and grow. The problem is that there is no formal institution who can deny surrounding municipalities to market themselves with attractive housing, even if the people that moves there has to commute to the twin-cities by car. These problems increase the secondary effects in other areas than the actual municipality.

The spatial planning and infrastructures has an important role to fill in order to have a more sustainable society. Localisation of houses, industries and commerce are important for the structure of the everyday life and needs to be discussed in more detailed ways. Transport infrastructure has to be put in a spatial planning perspective, and be discussed in a proper context. Infrastructure is a mean in order to have a functional society. The importance of
infrastructure is often excessive and is seen as a key for success in regional development contexts. Bigger local area market and economical growth are often the overall aim, so also in the fourth city region.

All projects discussed in this thesis causes effects on the environment. The mechanisms behind regional development are not primarily concerning environmental consideration. Even though measures are taken in the name of sustainability is there still a lack of forceful policies. Transports of freight and people are estimated to grow, sometimes based on debatable estimations and predictions, or in the plans of this report even a goal. Infrastructural projects will continue to have effects on the physical environment and the need of monetary and environmental calculations will increase its importance. However, the weighting between economical, ecological and social needs to be more diversified. The valuation methods mentioned in this report shows a process not considering or compensating negative ecological effects.

The transition towards sustainability takes time. The time factor is often forgotten in terms of planning. The results from a new road might not show for 10 years because of capacity and slow increase of traffic. The technocratic view on solving climate change with new technology is a possibility, but even though new technology can reduce emissions and energy use it still takes time before the entire system has changed. The project owners and stakeholders in the Twin City project needs to discuss their possibilities to change the system. Take Mobility Management as an example; to change peoples commuting habits by arguing rationally with price, time, efficiency and flexibility. The central actors have the power to plan for other transport means than the car.

Building a sustainable region is a multi dimensional process. It’s important to remember that the results in the sustainability process are dependent on interplay between mutual affected factors. The problem that occurs from regional development is a result from legislation, life patterns, individual actions, political intentions and so on. The planning documents discussed in this study have limited but important roles to play in the process towards sustainable development. The linkage between different levels is very important in order to get framework for development. Actors that can’t be controlled take individual decisions with individual rationality. The results from these individual actions can cause problems for the society as a whole. The municipalities of Linköping and Norrköping, Östsm and the County Administrative Board have an opportunity to govern the development in Östergötland and in the Twin City project by cooperating with important actors in the society. There is a need for a forum where sustainable development can be discussed, a forum with legislative power for comprehensive decisions.

Planning on the regional level is connected to national, regional and municipal programs and plans. Solving environmental problems connected to transport infrastructure, incorporates commuting, freight transport, land use and social structures. The spatial planning in the fourth city region should be founded on an open exchange of knowledge and experience to avoid synergy and cumulative effects. The idea of intermunicipal planning and a common comprehensive plan requires an open but clear definition of the hierarchical planning system.

The region is at the crossroad, with a upcoming common comprehensive plan between Linköping and Norrköping are there possibilities to take strategic decisions and turn the negative development towards a more sustainable future.
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Appendix I: Concepts of sustainability

From: (STEM, 2006 p15)
Appendix II: Development of a fourth city region

Railway
E4
E22, main roads and county roads
Municipal border
Important passages for communication and housing

(Linköpings kommun, 2005)