Åriket – A Case Study of Conflicts in Urban Development

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Abstract: Sustainable transport planning is a complex issue and has become a great challenge for today’s decision makers. One of the biggest concerns is how sustainable mobility can be reached; where social and economic interests can work together with environmental interests. By looking into a special case of transport planning in Åriket, Uppsala this paper analyses the decision making process as well as the response from other stakeholders presented as contesting story lines. The results show there are weaknesses in the planning process, where too few alternatives have been looked at and the methods used has not been able to handle the complex issues of sustainable development in an adequate way. From the contested story lines the different opinions in the question has been identified as either being a part of the old conventional transport paradigm or a part of the new sustainable mobility paradigm, which can be used as a guideline for the decision makers in what way to go for reaching sustainable mobility.

Keywords: Sustainable Development, Transport Planning, Sustainable Mobility, Policy Planning Processes, Contested Story Lines, Alternatives.

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Summary: One of the great conflicts in urban development is the issue of how to reach a sustainable transport paradigm. The use of cars has taken a large place in transport planning for several years, which have led to a lot of negative effects, mainly on the environment, but also negative social impacts and health issues which can be connected to the extensive car use. Transport planners and policy makers have been trying to come up with solutions for this problem, but this far there is no clear direction among the decision makers of how to reach the solution. A main problem is how to change from the old transport paradigm with the car in focus towards a new sustainable paradigm where the car is not in focus. By looking into a special case of transport planning in Åriket, Uppsala this issue has been investigated further in this paper. The case is about a suggestion of a bridge connection over Fyrisån in a very sensitive nature with four different alternatives of constructions:

Alternative 1A – A bridge for walking and bicycling
Alternative 1B – A bridge for walking, bicycling and PRT (Personal Rapid Transit)
Alternative 2A – A bridge for walking, bicycling and tram/bus
Alternative 2B – A bridge for walking, bicycling, tram/bus and car

In this paper the decision making process behind the alternatives has been analysed and from that the methods for sustainability could be investigated, showing there are some weaknesses with using only an EIA (Environmental Impact Assessment). The suggestion of using a more developed method implemented in an earlier stage in the planning process like a SEA (Strategic Environmental Assessment) has therefore been recommended to reach sustainable mobility. This case has been heavily debated among several stakeholders and to get an overview of the different opinions and highlight the conflicts present the responses sent in from different stakeholders were analysed and presented as four contesting story lines. The result showed a clear conflict between socio-economical and environmental interests, which were valued very differently among different stakeholders. In order to find out what story line that could be suggested as a sustainable approach in this case an evaluation of them was made according to Banister’s framework on a sustainable mobility paradigm (Banister, 2008). The evaluation showed that the story line positive to a car bridge was not compatible with the sustainable mobility paradigm, while a walk and biking bridge might be considered as a step in the right direction, but none of the alternatives are really in line with the sustainability paradigm. Therefore the option of look for other alternatives will be recommended. This is due to the sustainable mobility paradigm together with the knowledge of the possible harm a construction will give to the surrounding environment and the negative impact the intrusion can have towards the possibility of a sustainable urban development in the future.

Keywords: Sustainable Development, Transport Planning, Sustainable Mobility, Policy Planning Processes, Contested Story Lines, Alternatives.

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1. Introduction

In today’s society sustainable development is an important concern. One of the key sustainability challenges for urban planners is the issue of transport planning (Marshall, 2001). This is a very complex question that includes the handling of many different issues such as social, environmental, economical and physical dilemmas. A great concern among both private persons and decision makers are therefore how a sustainable development can be reached, which lives up to the demand and the life-standard we are expecting to have for a comfortable life and in the same time be able to take care of the environment for both us and future generations. At the moment there is no clear direction among the decision makers in transport policy about how to reach a sustainable development. There are some good intentions for a sustainable transport planning present, but those intentions do more often than less not become anything more than just intentions (Banister, 2002).

Traffic levels have been rising steadily in the last four decades, where the least environmental friendly sectors have had the most significant growth. Improved transportation has made it possible for longer journeys taking the same time as a shorter journey did before (Marshall, 2001). This has led to an increase in longer distance traveling among individuals, which have both environmental and social implications. Faster and longer travels lead to higher energy consumption, increased amount of greenhouse gases as well as more space for vehicles being required. This in turn means less space for pedestrians and green areas (Marshall, 2001). These overwhelming environmental problems that have arisen confine the policy debate in what to do and how. It is therefore very important to investigate and understand the issues present in environmental policy and the decisions made in it (Hajer, 1995). This paper will therefore evaluate a case of transport planning and look into methods that can help the politicians to go from only desk planning to an actual change in the decision making process and practise in the transportation sector.

The case is located in Uppsala, Sweden and is a very unique project. Not many new roads are planned these days (Interview Klint, 2014) and the outcome of this project can be seen as an important indication for future urban development and decision making in transport planning. By looking into and learning from this case, flaws in the process might be able to be avoided and improvements that can be made will hopefully be seen and work as guidance both for this case and for other cases in the future.

1.1 Aim

The aim of this study is to highlight the conflicts present in today’s urban development, and investigate whether a more sustainable approach to transport development is possible then what is present today. This will be done by looking into the special case of a planned transport connection in the area of Åriket in Uppsala. By investigating the case, the underlying reasons for the construction, comparing it with the reactions and suggested alternative approaches from other stakeholders, and using perspectives from academic literature, a critical assessment of the case will be carried out. It is hoped that this may lead to a change in the planning process and towards a more sustainable solution in the long term. In order to achieve the aim the following research questions will be investigated:

1. What alternatives are there and how were the alternatives identified?
2. What assumptions underpin these alternatives?
3. What was the response from other stakeholders to these alternatives?
4. Critical assessment with recommendations for practice - How well were the alternatives handled in the process? What improvements can be done?

In the first and second question a description of the different alternatives considered by the municipality will be presented and the decision making process behind the alternatives will be investigated, presented in section 4 and
5. In the third question the consultations from other stakeholders will be analysed and presented as four different story lines according to their different standpoints, presented in section 6. For the fourth question the different story lines will be compared as a conflict between a conventional and a sustainable paradigm where a critical evaluation of the different story lines will be carried out in order to see the alternative options from a sustainable point of view. Suggestions of what improvements can be done for handling important sustainable issues will also be discussed, all presented in section 7.
2. Background

This chapter introduces some necessary theoretical background information about the situation of urban growth, the concept of sustainable mobility, which is used as a framework to help reach sustainable transport, the use of environmental impact assessments and an explanation of contesting story lines, which are used as a method in the paper. The questions of why it is a problem and how we today are handling those problems will be answered.

2.1 Urban growth - transport and environmental implications

In the past, transport was seen as something positive and a part of the solution in urban development, but today that picture has changed and transport is more a part of a problem than a solution in urban planning (Marshall, 2001). Back then problems with running out of fuels such as oil were far away and limitations of space were not an issue, but times have changed and the role of the car has now not only a big part in our society, it also has a significant impact on the environment. For example in 2001 the transport sector was responsible for 25 % of the total amount greenhouse gases, which was already 5 % more than just ten years earlier (Marshall, 2001). This continuously increasing use of cars has led to both social and environmental implications we now have to deal with. Mobility limits, social and environmental costs, climate change and higher energy prices due to running out of fuels are just a few examples of many that argues towards a change in the transport system approach if we want to be able to have a sustainable society in the future (Banister, 2011).

The two main consequences of urban growth have been, and still are, the use of land, mainly due to residential development, and energy use, mainly due to mobility, (Camagnia et al. 2002). In addition health issues due to poor air quality and congestion as well as economic problems due to rising fuel and congestion costs, leads to a waste both of time and resources are consequences caused by unsustainable urban growth. But the issues are complex, mobility is very much connected with economic and social growth and urban growth demands greater mobility. In turn an increased travel frequency will lead to a lower quality of life. Probably mobility will not decrease, but soon there will be no other alternative than to change towards a more sustainable approach, mainly due to environmental limitations, but also due to the economic and social consequences it causes (Lam & Head, 2012).

2.2 Sustainable mobility

One of the biggest challenges in transport planning is to bring about a transition to sustainable mobility and as part of this to figure out what role we want the car to have in the future (Driscoll et al. 2011). For that the concept sustainable mobility is used. It includes two parameters; sustainable development and mobility. Sustainable mobility cannot be reached only by relying on technical measures and environmentally friendly vehicles. A fundamental change in human behaviour patterns and a reduced mobility are needed as well (Høyer, 1999). With that said the aim will not be to prohibit the use of cars, but instead work towards cites where there will be no need for having a car. By using clear planning strategies and focus on the interaction between land use and transport both good accessibility and a good environment can be reached (Banister, 2008).

The existing mobility paradigm, which has been established for a very long time with almost no change at all, is built on two other fundamental principles. First that travel is a derived demand. It is the goal of the journey that is the result of the travel and not the travel itself. Secondly that people are aiming to minimize their general cost of the travel, mainly valued through the cost of the travel weight against the time the travel will take. This have led to a growth of longer and faster travel distances where the increased costs of the travels have been accepted due to the increased speed and has made slower transportation like walking, biking and public transport less attractive, which in turn has led to an increased use of the car (Banister, 2008). This pattern is not sustainable, and a change is needed. In fact a small change can already be seen. Our increased income has made leisure time more valued and more leisure-based travels are preformed, were the travel time has become an activity more positively valued (Mokhtariana & Salomon, 2001). Also new information and communications technology (ICT)
has changed the conditions and gives room for greater travel flexibility, with the possibilities of mobile working or working from home for example (Banister, 2008).

From a sustainable mobility perspective it is important that the physical and social dimensions are balanced (Banister, 2008) and instead of a narrow-minded economical focus of time and speed, the aim should be to incorporate longer travel distances in a firm way according to our behaviour and culture (Banister, 2011). Some key actions that are needed for a transition towards a sustainable mobility paradigm (Banister, 2008) are presented below:

- The demand for travelling needs to be reduced - This can be done through substitution, were the trip is replaced by a non-travel activity or is substituted through technology (ICT), like internet shopping i.e. (Banister & Stead, 2007).

- A modal shift with help of transport policy measures - By promoting walking and biking and using control measurements against the traffic the transport policy can impact the development by reducing the car use and improve the possibilities for walking, biking and public transport systems (Banister & Marshall, 2000).

- The physical separation needs to be minimised in order to reduce the distances - Greener cities and more sustainable mobility patterns should be worked for by actions through land-use policy measures in order to reduce the demand for longer travel distances (Banister & Hickman, 2006).

- The technology should be used in the best way possible - By using the best technology available according to alternative fuels, renewable energy, engine design, standards for emissions and noise levels together with areas in the city restricted only for environmentally friendly vehicles, carbon emissions and noise levels can be reduced (Banister, 2008).

This requires some radical changes and the public acceptance will be very important in order for this transition to be successful. It is therefore very important with clear information through social pressure, demonstration, persuasion and marketing as well (Banister, 2008).

2.3 Environmental impact assessments

Since 1969 when environmental impact assessments (EIA) were introduced by National Environmental Policy Act (NEPA), it has become a standard method and a valuable tool for the decision makers when it comes to judge the environmental impact of planned projects (Pope et al. 2013). An EIA evaluates the environmental consequences of a proposed action thought to have significant effect on the nature or on the man-made environment (Wathern, 1988). In Sweden, according to the Swedish Environmental code, every time a new plan is carried out or an old plan is changed, by the municipality or any other authority, an environmental assessment of the new plan has to be done if the plan is thought to cause any significant environmental impact, this to promote a sustainable development (Miljöbalken, 1998). Despite the popularity of the EIA with a strong international body of participants and a well-established incorporation in legalisation and international agreements (Pope et al. 2013) critiques towards the method are raised. Ever since the method began to be used it has been project-by-project applied (Wood, 1995), which misses the broader sustainable issues that also are needed to be considered (Pope et al. 2013). Usually when an EIA is carried out the alternatives are already chosen and the EIA is performed on those alternatives as the objectives are tried to be reached. This limits the alternatives used for reaching the objective (Keeney, 1996). Critique towards that EIA occurs too late in the planning process and that all alternatives do not become adequately considered are made (Wood & Djeddour, 1992). These limitations of EIA together with the more and more complex situation of urban growth and sustainable development has made the demand for improved methods to assess sustainability in transport systems to increase (Pope et al. 2013). To take the environment in to account earlier in the process has therefore
been widely accepted and desired by many influential bodies, like the European commission for example who make the statement according environmental policy:

“...the Commission’s concern will also be extended, as rapidly as possible, to cover policies and policy statements; plans and their implementation; procedures; programmes (including both their overall objectives and their sub-elements) as well as individual projects” (Commission of the European Communities, 1987).

To avoid that alternative approaches do not get considered, and that a broader perspective of the issue, where impacts like cumulative impacts, synergistic impacts, side effects, global and regional effects possible and more indirectly projects impacts also gets considered, there is important that those becomes assessed on an earlier level, initially at policy, plan or program level instead of at project level (Wood & Djeddour, 1992). For that a development of the EIA has been carried out and a method called strategic environmental assessment (SEA) can be used instead. In a SEA evaluation of environmental impacts according to policies, plans and programs (PPPs) are carried out and where an EIA are investigating how to minimise the environmental impact on an already proposed development, SEA can have influence in an earlier stage of the decision making process and can impact on the choice of the alternatives developed. Because it takes place at this earlier stage, SEA will help the decision makers to enhance the combining of environmental and socio-economic goals (Wood & Djeddour, 1992).

2.4 Analytical approaches to implementing sustainable transport: contesting story lines

Story lines are a type of discourse analysis that helps to handle political dynamics in environmental issues. A story line can determine the interplay between social and physical realities and give meaning to it. They allow different actors to show their view in a question beyond their own discourse and give every stakeholder the opportunity to illustrate their point of view. Story lines are a good way for showing different actors opinions in a short-handed way were an identification of the conflicts becomes highlighted. This can reduce the complexity of a problem and helps to give closure to it which in turn can help to lead to a political change (Hajer, 1995). Story lines are therefore a good method to use in complex environmental political issues were many actors of different interests needs to be combined and come to a common understanding and it has been successfully used before in cases of sustainable transport planning (e.g. Driscoll et al. 2012, Richardson & Isaksson, 2009). Driscoll et al. have used a very similar concept as this paper will do and compared four contesting story lines to investigate the alternatives for a sustainable mobility in Iceland’s future transport planning and Richardson & Isaksson used the method for analyse the strategies behind the implementation of the congestion tax in Stockholm to point out the reasons to the success behind it. Story lines not only help to highlight a problem, they also create a social and moral order between the stakeholders, were the stakeholders role in the question can be identified as victim, perpetrator, scientist, problem solver or as scaremonger for example (Hajer, 1995).
3. Methods

In this section an explanation of the methods used in this paper, and the reasons for choosing them will be presented.

This study has been carried out as a single case study where different qualitative approaches have been used in order to answer the research questions. The background part of the current situation in urban development and transport planning was done as a literature review through academic research. For question one and two a literature review and documentary analysis of the detailed layout plan and the EIA was carried out together with interviews with the persons responsible for those documents. This was done in order to give the reader an overview of the case situation and the main issues of it. The interviews were done in a semi-structured way face-to-face with the person interviewed. For question three a documentary analysis over the consultations sent in from 38 stakeholders was made through reading of the consultations, taking out bullet points, gather the data and finally present it as a discourse analysis as four different story lines according to Hajer (1995). For question four a critical evaluation was performed on the different story lines based on the framework of the sustainable mobility paradigm by Banister (2008).

3.1 Case study

A case study research design was chosen since it combines different methods, techniques, strategies and theories (Johansson, 2007), where the data is conducted within context of its use. This approach helps to understand the complexity of issues in life that otherwise could have been hard to do, and makes it possible to explain both the process and the outcome in question (Zainal, 2007). One of the weaknesses with the method is the possibility of being bias (Zainal, 2007). In order to reduce that risk, all groups of opinions have been equally handled and their arguments have been presented objectively. Another weakness argued is that a case study often tends to be very long which makes it hard to manage and difficult to organise the data systematically (Zainal, 2007). In order to avoid that the case study has been limited by the research questions presented above, since it is important that the study has boundaries, but in the same time are selected in a way that maximizes the outcome of the study in the period of time available (Tellis, 1997).

3.2 Literature review

The literature review was used to give a background of the situation in urban growth, the debate in transport planning and methods for environmental assessment to understand the current context better. An explanation of the concept of competing story lines was made to explain why that method was adopted in this research. The literature was mainly found through the library database by academic research. The critical assessment of the story lines comparing different mobility paradigms was based on the paper “The sustainable mobility paradigm”, where the author David Banister proposes a framework for a sustainable mobility approach which he compares with the conventional mobility approach.

3.3 Interviews

The interviews were performed in a semi-structured way, which is the most commonly used method in qualitative research (DiCicco-Bloom & Crabtree, 2006) and a method preferred when you only have one chance to interview someone (Bernard, 2006). It is known to work very well when you are in contact with a high level of bureaucrats or people with high status in the community (Bernard, 2006) as was the case here and therefore seemed appropriate. The choice of doing face-to-face interviews even though it is a bit time consuming, was made to get a better feeling of the interview object and more underlying information was then possible to be reached from the interview (DiCicco-Bloom & Crabtree, 2006). The possibility of being biased is always a risk in interviewing and in order to avoid this risk, the interviews have been tried to be performed with an open mind and with no preconceptions.
3.4 Documentary analysis

Documentary analysis was used since data from all the relevant stakeholders was available and compared to the alternative of doing interviews documentary analysis is much more time efficient, since it is data selection instead of data collection (Bowen, 2009). Documentary analysis was also chosen since it is a qualitative method where documents are read and reviewed systematically and the data are examined and interpreted in order to evoke meaning, understanding and to develop empirical knowledge in the subject (Bowen, 2009), which was the objective of the analysis in this case. Documentary studies can be practically challenging, but also a rich source for getting data that otherwise would be hard to collect and are seen as a valuable method for researchers doing comparative studies of policy implementation (Shaw et al. 2004).

3.5 Reflections of the research process

Since my background is from the natural science field it has been challenging but also very interesting to work with this question as a research in social science. I personally feel that I have learned a lot during this research and even in a complex question like this where nothing is black or white, a relatively clear result could be obtained showing guidance for reaching sustainable development. If I was to do the research again I would probably have done my interviews even more open, in order to try obtain even more information and get an even better picture of how and what the interview objects are thinking. If more time had been available, analysis of more consultations from private persons as well could have been done and maybe some more interviews with other decisions makers as well to get an even broader picture of underlying arguments in the question. Otherwise I do not think I would have change any of the methods used since I think they were very successful in my research and answered all my research questions in a satisfying and clear way. In the future, now when I am more familiar with the subject and the methods, I would probably be able to be more effective and be able to have a clearer plan from the beginning, which would lead to a faster research process.
4. The alternatives

In this section the case will be described more in detail. The area of interest and the four different proposals of the construction present in the detailed layout plan made by Uppsala municipality will be presented and explained further together with their environmental impacts.

4.1 Description of the case

The city of Uppsala, Sweden is predicted to increase its population from today’s 200 000 to 250 000 or more in 2030 and in 2050 it might be almost 350 000 inhabitants. An important part of the development is therefore to increase the accessibility between the south east and the south west parts of Uppsala. This is thought to be done by a traffic connection over Fyrisån with the location of the bridge going through a big sensitive nature area called Åriket. Except to increase the connection between the parts of Gottsunda/Sunnersta/Ulorna on the west side and Sävja/Bergsbrunna on the east side a new train station in Bergsbrunna is planned to increase the accessibility regionally as well (Uppsala kommun, 2013a).

The area of investigation is located around 6 km from central Uppsala and is a large nature area which contain habitation mainly in Ulorna west of the river and in Nåntuna east of the river. The area is of national interest for cultural and natural values and lies within an area of landscape picture protection and conservation worth farmland. In the area a nature reserve (called Årike-Fyris) has been planned for in order to preserve and develop the unique cultural landscape and highlight the cultural heritage values present in the area. Besides that the area also maintains two of Linnés pathways which are an important part of the application to the UNESCO world heritage list (Uppsala kommun, 2013a).

![Fig. 1. Map over the investigation area (marked with dotted lines) and the two suggested roads marked as red corridors (Uppsala kommun, 2013a).](image-url)
In the detailed layout plan two different locations for the bridge are presented and for each location two different transport alternatives are suggested as shown below:

**Alternative 1A** – North location with walking and bicycling  
**Alternative 1B** – North location with walking, bicycling and Personal Rapid Transit (PRT)  
**Alternative 2A** – South location with walking, bicycling and tram/bus  
**Alternative 2B** – South location with walking, bicycling, tram/bus and car

The alternatives are presented individually, but an option mentioned as well is the possibility of combining alternative 1A and alternative 2B, with the walk and bike bridge and the trafficked bridge separated from each other (Uppsala kommun, 2013a)

### 4.2 Alternative 1

![Map over the investigated area with alternative 1A-B marked as a red corridor (Uppsala kommun, 2013a).](image)

**4.2.1 Location**

Alternative 1 goes from the west side of Ulls väg, pass by Undervisningsplan, perpendicular over the river and continues over some arable land to Nåntuna were it will connect with already existing walking and biking routes. From there it will continue either east or south (Figure 2). In alternative 1B, with a PRT, tracks towards Bergsbrunna station, Gottsunda and Resecentrum will be expected as well, with one track going south from Central Uppsala towards Sunnersta and one track going over the river between Gottsunda and Bergsbrunna (Figure 3) (Uppsala kommun, 2013a).
4.2.2 Advantages and limitations

A bridge will give rise to a shortcut over the river that will increase the accessibility between the south west and the south east parts of Uppsala as well as to the recreation area of Åriket and with a PRT there will be an increased accessibility on a regional level as well. But alternative 1 gives no opportunity for any other public transport or traffic since it in that case is expected to be both too disturbing for the environment in Ultuna and a too significant feature in the open landscape that Ultuna holds east of the river (Uppsala kommun, 2013a).

4.2.3 Personal Rapid Transit (PRT)

In alternative 1B a personal rapid transit (PRT) is suggested (Uppsala kommun, 2013a). PRT are small vehicles as you can travel alone in or with company as you chose. The travel goes from a start station to an end station, with no stops in between. The destination is chosen by the traveller and the departure times are on demand and not according to any time table and since they are driver free they are available all around the clock (Regeringskansliet, 2009). A PRT can be constructed both at the ground and above the ground to avoid unwanted interaction with other traffic. The construction will affect the landscape picture, but can be more elegant than a car bridge, since it has the possibility for smaller ramps and steeper slopes. According to noise levels the PRT is very silent and can go close to living areas without bringing any significant disturbance. To the PRT stations need to be added, but how and where they are to be placed will be considered later on. If alternative 1B is accepted the plan is to build two parallel bridges, one for walking and biking and one for the PRT. Both will be on a height of 3.9 meters and with the possibility for bridge openings in order not to block the boat traffic (Uppsala kommun, 2013a).
4.3 Alternative 2

![Map over the investigated area with alternative 2A-B marked as a red corridor (Uppsala kommun, 2013a).](image)

### 4.3.1 Location
Alternative 2 goes from Gottsunda and connects with Dag Hammarskjöldsväg, then it will go east and pass by the habitation in Ultuna on the south side, continue over some open arable land between Ultuna and Sunnersta, then pass by Ultuna källa on the north side, go perpendicular over the river and then continue south until it connects with road 255 (Figure 4). To connect the public transport and the walk and bike routes with this new route a complementary route will be needed. One suggestion is to extend Ulls väg to the south, but is needs to be further investigated. Alternative 2B comes with two different alternatives as well. The first alternative is a road for mixed traffic with no connection to the road E4 (the main highway towards Stockholm) and the second alternative is a road for mixed traffic with a connection to the road E4 (Uppsala kommun, 2013a).

### 4.3.2 Advantages and limitations
The connection over the bridge will create a shortcut between two main routes that will lead to a more attractive public transport and an improved accessibility in the area. It will also give rise to an opportunity for construction of more housing in the south of Ultuna, since the area in that case will become more integrated with the street routes. An openable bridge, as are needed, can however lead to delays in the schedule for the public transport and fast occurring traffic jams for the car traffic. In alternative 2B the traffic is estimated to be pretty heavy, which means that two separate bridges probably will be necessary, one for car traffic and one for walking and biking. An alternative could also be one bridge with lower speed limits, but it would diminish the benefits of the connection regarding the time aspect (Uppsala kommun, 2013a).
4.4 The environmental situation

In this section the environmental situation in the area of interest will be explained and the effects a construction of a bridge can cause based on the EIA carried out for this case will be presented.

4.4.1 Natural values
The area of interest and its surroundings contain several natural values. In the south of Ultuna lays Ultuna källa, which is of national interest for nature conservation and at the west side of Ultuna källa there are dry grasslands with high natural values where many rare and red listed species lives. On both sides of the river wetlands and meadows are present with high natural values as well. The long valley of Fyrisån is an ecologically sensitive area and the corridor that goes along Fyrisån from Uppsala and south is one of eight green wedges in Uppsala. The judgement from the EIA is that the construction will have physical impacts on previously untouched nature areas and it can affect both water and land negatively. Alternative 1A-B is estimated to only have a small impact on the natural values, while alternative 2A-B is estimated to have a bigger impact physically, but also due to increased noise that can interfere with the bird life in the area (Klint et al. 2013).

4.4.2 Cultural values
The area is of national interest for cultural conservation. It is also part of an area with conservation worth farmland and it lies upon previous old villages which have had permanent settlement for around 2 500 years. In the area two pathways of Linné are present as well. Those was a part of Linnés scientific work; The rise of systemic biology, and is now a part of the application of get in to the UNESCO world heritage list, in order to preserve Linnés cultural heritage as a world heritage. All alternatives will have negative effect on the cultural and historical environment. The new construction will not interact in positively with the existing historical structure in the area. It will be a barrier in the historical landscape and destroy the coherent landscape as is present today. It will also cross one of the Linné pathways, which can affect the outcome for the world heritage application. Alternative 1A-B is estimated to only have a small impact on the cultural values, while alternative 2A-B is estimated to have a large impact on the areas cultural values (Klint et al. 2013).

4.4.3 Recreational values
The whole area is considered as a recreational area with nature areas and parks containing both social and ecological values. The area is also part of the planned nature reserve Årike-Fyris, where one of the purposes is to keep a bigger coherent nature area for recreation, outdoor life and for better access to the nature. A new connection will increase the accessibility and therefore the recreational possibilities, but in the same time the bridge will have a visual impact on the landscape, which can be negative for the recreational experience. Alternative 1A-B and 2A is estimated to have small or moderate impact on the recreational values, while alternative 2B is estimated to have a large negative impact, mainly due to the barrier effect and the increased noise it will create (Klint et al. 2013).

4.4.4 Landscape picture
The area lies within a bigger area covered by landscape picture protection along Fyrisån. A bridge would destroy today’s long sight-lines and be a whole new element in the original natural and cultural landscape. The negative impacts on the landscape picture are estimated to be big. Noise protection walls, at least three meters high, will be needed for alternative 2A-B, and probably lights as well. To address the risk for flooding the bridge will have to be put upon an embankment for long distances on both sides of the river. To mitigate the environmental impact a very smooth design that fits the landscape and support in the terrain will be needed (Klint et al. 2013).
4.3.5 Land and water
Uppsalaåsen, which is one of Sweden’s biggest aquifer goes through the area and is considered to be a very important source for the water supply. Fyrisån is classified as a particularly valuable water area, since it has such high values for water supply, water quality and recreation that it should be long term preserved. It can also be some smaller areas with artesian water north of Ultuna källa, where a puncture of the mud layer in such area can lead to a release of ground water and damage the well (Klint et al. 2013). Alternative 1A-B is located in the inner protective zone for the water catchment and alternative 2A-B is located in the outer protective zone for the water catchment, which means that all alternatives have a risk of damage the protective mud layers and contaminate the ground water during the construction work. Alternative 2A-B is estimated to create a risk for contamination later on as well. Uppsalaåsen lies partly on deep mud sediment layers, which means that the ground has to be strengthened in order to avoid subsidence. The risk for puncture an area were artesian pressure is present is estimated to be small and only occur in the location of alternative 1A-B. Alternative 2A-B will generate stormwater that needs to be handled or otherwise the water quality norms in both Fyrisån and the lake of Ekoln might not be reached (Klint et al. 2013).

4.3.6 Noise
Alternative 1A-B will generate very small or no noise at all. Alternative 2A and 2B on the other hand will generate significant noise into a former quiet area. In the layout plan from 2010 there is a goal of not have any noise that reaches over 40 dBA, but in alternative 2A an area of 110-120 meter and in alternative 2B an area of 150-900 meter on each side of the road can be affected with noise over 40 dBA if no noise protection is used. Heavy noise protection measures will therefore be needed. A new road with increased traffic noise can also pose a limitation in how future housing development in the area can be designed in order to cope with the national limit of 55 dBA in living areas (Klint et al. 2013).

4.3.7 Climate effects
According to the system analysis over the expected carbon dioxide emissions, the difference in emissions between the alternatives are relatively small, but highest emissions will be obtained in alternative 1A and lowest will be obtained in alternative 1B (WSP, 2013), this is due to the shorter travel distance for the motorised traffic in alternative 1B, 2A and 2B. All alternatives will go through areas with risk for flooding, with a little bigger risk area for alternative 2A and 2B. A wide open area under the bridge would probably be necessary to not cause damming upstream and embankments needs to be high enough or in other ways protected so they can cope with the futures water levels (Klint et al. 2013).
5. The decision making process

In this section the process behind how the alternatives investigated in the detailed layout plan were identified will be presented together with what assumptions underpinning those alternatives are.

The alternatives have been identified throughout the planning process of a detailed layout plan (Figure 5). The detailed layout plan is a product from the municipality’s layout plan and it is carried out through three main steps presented below (Uppsala kommun, 2013b):

❖ **Step 1 - Consultation**
After a plan proposal is set an EIA over the area of interest is carried out and the municipality puts the proposal out for consultation were different stakeholders like Länsstyrelsen, regional planning organs, other municipalities, as well as administrative authorities, organisations and private persons gets the possibility to leave comments on the proposal.

❖ **Step 2 - Exhibition**
After the consultation the comments from the consultations are summarised in a consultation document and the plan suggestion is modified by the municipality, (which is where the planning process are at right now in this case). After that the layout plan will be out on exhibition for another two months and comments of the revised plan can be made and sent in to the municipality again.

❖ **Step 3 – Adoption**
The comments from the exhibition will here be summarised and treated in a statement. The plan will then be modified again and after that will it (if satisfying) be accepted by the city council and adopt legally binding (Boverket, 2012).
A layout plan is an important part of a municipality’s long term planning and it demonstrates the plan for new housing and work places as well as what green areas should be preserved and what future transport planning will look like. The latest layout plan for Uppsala municipality was made in 2010 and from that the detailed layout plan of interest arises. The role of a detailed layout plan is to investigate a proposal in the layout plan more clearly (Uppsala kommun, 2012). The work of producing a detailed layout plan includes background research such as technical investigations, system analysis of different traffic scenarios, economical judgements, terrain studies, landscape studies and cultural studies, all in order to get a good basis for the plan. In this particular case seven background reports were used in the planning process, and based on them an additional EIA was carried out (Uppsala kommun, 2014). The EIA was used in the process to help eliminate alternatives not environmentally good enough, and from that the four alternatives presented were selected for future consideration in the planning process (Interview Carlén, 2014).

5.1 Underpinning arguments from the municipality

*Here will the assumptions underpinning the arguments be analysed in order to understand the reasons behind the alternatives presented more in depth.*

*Table 1. Assumptions from the municipality according the construction of a bridge over the river in the area of Årike-Fyris* (Interview Carlén, 2014).

<table>
<thead>
<tr>
<th>Assumptions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will lead to an increased access between south west and south east parts of Uppsala</td>
<td></td>
</tr>
<tr>
<td>Other alternatives are not possible for reducing travel time and increasing accessibility</td>
<td></td>
</tr>
<tr>
<td>If there is no time saved there will be no decrease in the traffic over Resecentrum</td>
<td></td>
</tr>
<tr>
<td>Shorter distances leads to shorter travels (\Rightarrow) less pollution</td>
<td></td>
</tr>
<tr>
<td>There will be a train station in Bergsbrunna</td>
<td></td>
</tr>
<tr>
<td>A tunnel is impossible to build</td>
<td></td>
</tr>
<tr>
<td>The new road will not lead to any other big constructions in the area due to the bridge</td>
<td></td>
</tr>
<tr>
<td>The amount of people using public transport will increase (if an option including public transport is accepted)</td>
<td></td>
</tr>
<tr>
<td>The capacity will not increase, only the accessibility (\Rightarrow) no increase in traffic</td>
<td></td>
</tr>
<tr>
<td>Significant impact on the environment can be avoided</td>
<td></td>
</tr>
<tr>
<td>No increase in emissions due to shorter travel distances and control measure managements</td>
<td></td>
</tr>
</tbody>
</table>
Will not affect the application to UNESCO world heritage list if the bridge is in the plan when the application is sent in

Broadening any of the already existing bridges will not lead to shorter travel time and then the connection loses its purpose

Even if any of the already existing bridges are broadened they will not be able to handle public transport

The underpinning arguments in this question are based on the assumption that time and accessibility is the two most important parameters in the question. Even though the area is a very sensitive nature area the belief is that the gain of the connection will be greater than the damage it will cause. A bridge over the river would create a shortcut for people living in the area around which would lead to shorter travel distances and in turn lead to shorter travels and less pollutions. The reason mentioned for not looking at any alternatives outside the investigation area is that no other option would lead to a higher accessibility and in the same time save time, which is the aim with the whole project (Interview Carlén, 2014).

5.2 Discussion

From the table above it can be seen that the socio-economic arguments are strong and the environmental issues are addressed quite superficially, and almost overlooked in the process. The municipality gives the impression that most of the problems will be able to be solved, but they do not give any specific explanation of how. When looking more closely at the arguments it can be seen that many of them only are assumptions and the many negative environmental implications that are highly possibly according to the EIA are not prioritised when it comes to the final decision making. A question that can be raised is whether this is due to weaknesses in the decision making process, or whether it is the decision makers who have to take a bigger responsibility to weigh the environmental values as highly as the socio-economic? As seen in figure 5, the environmental assessment is carried out after the plan proposal was already set, which limits the possibility of other alternatives in the question, since they then are limited to the particular area covered by the detailed layout plan. By using another method, like strategic environmental assessment for example, more alternatives might could have been considered, and the issues of sustainability could have been implemented at an earlier stage of the process, which might have influenced the decision making in a more sustainable direction.
6. Result from consultations

In this section the response from other stakeholders will be presented in order to answer question three. Consultations from companies and organisations have been analysed and grouped into four different story lines. They are first presented in a table with the main arguments for each story line followed by a text elaborating on the arguments. In the end a discussion about the result is made highlighting the main conflicts present in the issue.

The detailed layout plan was decided to be out for consultation between the 9th of October 2013 and the 3rd of January 2014 (Uppsala kommun, 2014). During that time everybody living and working in Uppsala had the possibility to send in their opinions to the municipality. Consultations from 38 different stakeholders was received and have been analysed and put together into four different story lines as suggested by Hajer, (1995) as a method to highlight political conflicts. The story lines are presented in the tables below and showing the main arguments and concerns from each group.

### 6.1 Story line 1 - A bridge without car traffic is a good solution

<table>
<thead>
<tr>
<th>Environmental impact</th>
<th>Main arguments</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural values</strong></td>
<td>Alternative 1A will minimize the damage of the environment and the world heritage</td>
<td>Miljöpartiet, Socialdemokraterna, Kulturämbetets Miljö- och hälsoskyddsämbetet, Miljö- och hälsoskyddsämbetet, Klimatämbetet, Ultunaskolan, Cykelföreningen, Uppsala Cykelföreningen, Upplands Ornitologiska Föreningen, Cykelförmjandet Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td></td>
<td>Alternative 2A-B will give severe damage to the planned nature reserve, the national interests and the world heritage application</td>
<td>Miljöpartiet, Socialdemokraterna, Kulturämbetets Miljö- och hälsoskyddsämbetet, Klimatämbetet, Ultunaskolan, Cykelföreningen, Uppsala Cykelföreningen, Upplands Ornitologiska Föreningen, Cykelförmjandet Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td></td>
<td>Do not know how the biodiversity will be affected by a car bridge</td>
<td>Miljöpartiet, Socialdemokraterna, Kulturämbetets Miljö- och hälsoskyddsämbetet, Klimatämbetet, Ultunaskolan, Cykelföreningen, Uppsala Cykelföreningen, Upplands Ornitologiska Föreningen, Cykelförmjandet Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td></td>
<td>A bus and car bridge will have a severe impact on the birdlife in the area</td>
<td>Miljöpartiet, Socialdemokraterna, Kulturämbetets Miljö- och hälsoskyddsämbetet, Klimatämbetet, Ultunaskolan, Cykelföreningen, Uppsala Cykelföreningen, Upplands Ornitologiska Föreningen, Cykelförmjandet Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td><strong>Cultural values</strong></td>
<td>Data about how the cultural historic will be affected needs to be presented</td>
<td>Kulturämbetets Miljö- och hälsoskyddsämbetet</td>
</tr>
<tr>
<td></td>
<td>Could have a vantage point with information about the landscape</td>
<td>Kulturämbetets Miljö- och hälsoskyddsämbetet</td>
</tr>
<tr>
<td><strong>Recreational values</strong></td>
<td>A walk and bike bridge give better access to the nature</td>
<td>Miljöpartiet, Socialdemokraterna, Uppsala Cykelföreningen, Upplands Ornitologiska Föreningen, Cykelförmjandet Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td><strong>Landscape picture</strong></td>
<td>The negative impact on the landscape picture can be minimised with only a walk and bike bridge</td>
<td>Miljöpartiet</td>
</tr>
<tr>
<td></td>
<td>Would be too severe intrusion with a car bridge</td>
<td>Miljöpartiet</td>
</tr>
<tr>
<td><strong>Land and water</strong></td>
<td>A car bridge has a greater risk of having a negative impact on Ultuna källa</td>
<td>Miljöpartiet</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Vision and noise conditions will change a lot with alternative 1B and 2A-B</td>
<td>Miljö- och hälsoskyddsämbetet, Upplands Ornitologiska Föreningen</td>
</tr>
<tr>
<td></td>
<td>Are no investigation about how the noise will affect the birdlife</td>
<td>Miljö- och hälsoskyddsämbetet, Upplands Ornitologiska Föreningen</td>
</tr>
</tbody>
</table>
### Climate effects
A new car road will lead to increased traffic = increased pollution
Would impair Uppsala’s possibilities to reduce their carbon emissions

Miljöpartiet, Socialdemokraterna, Miljö- och hälsoskyddsämnden, Klimataktion, Uppsala Cykelförning, Cykelfrämjandet Uppsala

### Construction problems
Risk to divide Ultuna campus in two
Alternative 1A will improve the bike opportunities
PRT seems unrealistic

Miljöpartiet, Ultuna studentkår, Cykelfrämjandet Uppsala, SLU

### Planning process
Should include a tram in the planning
A new car bridge is not necessary, should look at other possibilities
Focus on public transport not car traffic
Need to complement with a clear plan of the development of the south of Uppsala
More fossil fuel independent transport systems need to be considered
Miss information about how many that would need this connection

Miljöpartiet, Socialdemokraterna, Miljö- och hälsoskyddsämnden, Klimataktion, Upplands Ornitollogiska Förening, Cykelfrämjandet Uppsala

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This group of stakeholders are positive towards a bridge for walking and biking, but are against a bridge that will include car traffic. Most of the stakeholders promote alternative 1A in the detailed layout plan, were only a walk and bike bridge is suggested, with the exception of one stakeholder (Socialdemokraterna), who are positive to include public transport as a possibility as well.

### Gives improved accessibility with mitigated environmental impact
The main arguments for this story line are that a walk and bike bridge will increase the accessibility and the recreational values, but with a smaller impact on the surrounding environment than the other alternatives presented in the detailed layout plan will have. The stakeholders also mean that increased biking will lead to a socio-economic gain and depending on how the bridge will be constructed it is possible to build it without any severe interference with the nature around. Socialdemokraterna are positive to alternative 2A as well, they think that including public transport will give even more social and economic benefits. They think the opportunities for more housing and jobs in connection to a new road have been underestimated and it could be good for the urban development.

### A bridge with mixed traffic will promote increased traffic
The arguments against a car bridge are mainly due to the damage it will give to the world heritage and the nature reserve. A trafficked road will also give an extensive change in the cultural landscape and in the landscape picture, mainly due to increased noise, noise protections, lights and increased emissions. The conclusion of that is that only alternative 1A can be accepted. All the other alternatives presented will encourage an increased traffic which will lead to an increased amount of emissions and in turn make it very hard for Uppsala to reach their climate goals. A car bridge would also work against the ambition of doubling the public transport and promote more walking and biking, which the city has as a goal as well. There is also some questioning about the system analysis used for the traffic predictions. The system analysis says that the emissions will decrease in all alternatives except 1A, which goes against 100 years of experience of the opposite according to literature. A car bridge will not only interfere will the nature it will also interfere a lot with Ultuna campus and the research areas
they are having there. A walk and bike bridge on the other hand will not have such a great impact and can therefore be acceptable. According to public transport, there is a risk that if it gets approved, it can easily be changed into a car bridge in the future. According to the alternative PRT, it is seen as a very unrealistic alternative. It has already been rejected by the municipality once and many think it is a too untried alternative. It would also be a hinder for the bike traffic if it is constructed as suggested in alternative 2A.

Suggest improvements in the planning process
According to how the planning process has been carried out, these stakeholders think some improvements should be done. The environmental assessment is not enough and does not satisfyingly show how a bridge for cars will affect the nature values. Especially the impact on the bird life has to be further investigated. Only one scientific reference has been used to presenting the noise effect on the bird life and the overall noise measures seems to be pretty arbitrary. They also think it is important to connect the planning of this project with the urban planning of the rest of Uppsala, as well as look into more fossil fuel independent alternatives and investigate further how many actually need this connection, which all has been poorly presented in the report.

This group suggest, even though they are positive to a walk and bike bridge, that before any more decisions are taken about the bridge the municipality should look into other alternatives as well and gives some suggestions for improvement possible presented below:

- Plan for a route and more effective public transport over Flottsundsbron.
- The possibility of tram over Flottsundsbron should be investigated and considered in the planning.
- For increased car traffic capacity start look into the possibilities of improve the capacity on Kungsängsbron and Flottsundsbron. Flottsundsbron is only a few km away and there is better to improve already existing bridges than build a new one.
- Investigate if Vindbron can be used to relive some of the traffic from the city.
- Complement the suggested bike route with an extensive bike route from the west of Gottsunda towards Bergsbrunna station.
- The municipality should investigate extending the road to Knivsta station and let the public transport go there.
- To minimise the impact on SLU they suggest letting the bike route go through Ultunaallén instead of through Alms allè. If a traffic road is built is should be placed as south as it is possible away from SLU towards Sunnersta.
- Promote a walk and bike bridge and then go for more tracks from Bergsbrunna station towards Stockholm. It will be better than build a road to E4.
- Build a vantage point in connection to the walk and bike bridge with information about the landscape for the inhabitants to learn more about the cultural landscape.
### 6.2 Story line 2 - A car bridge is a good solution

*Table 3. Positive arguments about a connection for all kinds of traffic (Armandt, 2014).*

<table>
<thead>
<tr>
<th>Environmental impact</th>
<th>Main arguments</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural values</strong></td>
<td>Need to make a trade-off between the environmental and social benefits</td>
<td>Handelskammaren, Uppsala Universitet</td>
</tr>
<tr>
<td></td>
<td>Positive as long as the national interests and the world heritage application does not become negatively affected</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural values</strong></td>
<td>No arguments mentioned</td>
<td></td>
</tr>
<tr>
<td><strong>Recreational values</strong></td>
<td>Increased access gives increased possibility for recreation activities</td>
<td>Trafikverket, Landstingstyrelsen, Idrotts- och fritidsnämnden</td>
</tr>
<tr>
<td></td>
<td>To increase the recreational values the walk and bike bridge should be separated from the car bridge</td>
<td></td>
</tr>
<tr>
<td><strong>Landscape picture</strong></td>
<td>Assumes that barrier effects will be minimized</td>
<td>Idrotts- och fritidsnämnden</td>
</tr>
<tr>
<td><strong>Land and water</strong></td>
<td>No arguments mentioned</td>
<td>Trafikverket, Landstingstyrelsen</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Will be increased noise, but noise protection can help to keep it within the limited value</td>
<td></td>
</tr>
<tr>
<td><strong>Climate effects</strong></td>
<td>No arguments mentioned</td>
<td></td>
</tr>
<tr>
<td><strong>Construction values</strong></td>
<td>Will give an increased accessibility between east and west of Uppsala</td>
<td>Trafikverket, Landstingstyrelsen, Idrotts- och fritidsnämnden, Regionsförbundet Uppsala län, Akademiska hus, Fastighetsägarna MittNord, Uppsala Universitet</td>
</tr>
<tr>
<td></td>
<td>Public transport might not be able to alone meet the increased demand that will come with an increased population</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New houses are planned to be built in the area, which will lead to an increased pressure on already existing roads they might not be able to handle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It will unburden the pressure on Resecentrum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Will create shorter travel distances</td>
<td></td>
</tr>
<tr>
<td><strong>Planning process</strong></td>
<td>Should be done stepwise with measure managements and with focus on public transport in first hand</td>
<td>Trafikverket, Landstingstyrelsen, Regionsförbundet Uppsala län</td>
</tr>
<tr>
<td></td>
<td>Should be complemented with an extended planning area more integrated with the city planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With a new train station in Bergsbrunna the accessibility in that area needs to be improved</td>
<td></td>
</tr>
</tbody>
</table>

This group are leaning towards a more socio-economic approach than environmental approach in their arguments and believe that an increased capacity for cars will be necessary in the future. Today many have to take extended routes to get from to the east to the west side of the river. With an increased population that number will be bigger as well. A bridge over the river will therefore create a necessary shortcut that shortens the travels. They are agreeing on that a big investment in public transport will have a negative environmental impact, but thinks it probably will be necessary in the future anyhow, and it is therefore seen as a good investment. Mitigation measures should however still be carried out and it is important that the national interests and world heritage will be protected and that the noise stays within the accepted levels, preferably by using noise protection if the bridge is built.
More advantages than disadvantages for the society

The stakeholders argue that if a road for all kind of traffic is accepted it will be positive for the society. Around the area suggested for the construction of the bridge there is a big potential for a good urban development and better shuttle possibilities with more trams from Bergsbrunna station towards Stockholm, which can give an improved status for Uppsala in the business world. It will also increase the possibility to go to recreational areas and perform recreational activities which will lead to an improved quality of life for the inhabitants. And if Bergsbrunna station is built as planned it will be an important part for Uppsala as a north node in the capital area, and it is then crucial that the accessibility towards it are good. To conclude, if a trade of between the environment and the socio-economic gains are done the socio-economical net effects will be clearly positive. Mainly according to all building possibilities in the area, but the bridge will also be a very important part for reliving the pressure of traffic over Resecentrum.

Stepwise planning process

The planning process should not be as isolated as it is at the moment, it should be included in a bigger scale of the regional planning and the urban development with all the new housings planned considered in the city present. A suggestion is to make the bridge construction stepwise, with the priority of a walk and bike bridge together with a bridge for public transport with control measures in first hand and then a car bridge in second hand. According to the connection with E4, half of the stakeholders are positive to start planning for the connection now and half of them think that it should wait, since it will not be necessary until later anyway and therefore is not anything that has to be decided for yet.

6.3 Story line 3 - All alternatives are bad

<table>
<thead>
<tr>
<th>Environmental impact</th>
<th>Main arguments</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural values</td>
<td>Are a big threat to the biodiversity and nearby environment</td>
<td>Naturskyddsföreningen, Linnés vänner, Föreningen Vårda Uppsala, Föreningen Linnés Historiska Landskap, Svenska Turistföreningen, Uppsala fältbiologer, Jordens Vänner Uppsala, Friluftsfrämjandet Uppsala lokalavdelning, Bostadsrättsföreningen Skogsblomman, Sunnersta Egnahemsförening, Svenska Linnésällskapet</td>
</tr>
<tr>
<td></td>
<td>Give extensive damage to a unique “close to town” nature area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eliminates the changes for being world heritage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Substantial damage to the planned nature reserve</td>
<td></td>
</tr>
<tr>
<td>Cultural values</td>
<td>Will give a severe damage to the cultural values</td>
<td>Linnés vänner, Föreningen Vårda Uppsala, Föreningen Linnés Historiska Landskap, Uppsala Sjösportföreningars Samarbetskommitté, Friluftsfrämjandet Uppsala lokalavdelning, Svenska Turistföreningen, Svenska Linnésällskapet</td>
</tr>
<tr>
<td></td>
<td>We have a responsibility to take care of our cultural values</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contains unique cultural and historical values</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is a rich resource for Uppsala and its tourism</td>
<td></td>
</tr>
<tr>
<td>Recreational values</td>
<td>A now quite area will be relative loud</td>
<td>Naturskyddsföreningen, Linnés vänner, Föreningen Linnés Historiska Landskap, Uppsala Sjösportföreningars Samarbetskommitté, Friluftsfrämjandet Uppsala lokalavdelning, Bostadsrättsföreningen Skogsblomman</td>
</tr>
<tr>
<td></td>
<td>The recreational value of green areas will be increasing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Årike-Fyris is the most valuable recreation area in the city</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A road around the city will make it more attractive for walking and bicycling</td>
<td></td>
</tr>
</tbody>
</table>
Landscape picture
Will be a significant barrier in the agricultural landscape
Would be a direct threat to the unique landscape

Land and water
A threat to the groundwater

Noise
Will create a lot of noise
The noise will diminish the natural and cultural values
Noise protection will cause a negative effect on the agricultural landscape

Climate effects
Will give more traffic
A decrease in traffic on the other roads will only be marginally
Shorter travels is only a speculation

Construction problems
A road would give a higher acceptance for more construction in the area
Big uncertainty about the train station in Bergsbrunna

Planning process
Should point out other discussed alternatives in the investigation
Already existing bridges could be a solution for better connections
A tram alternative should have been included in the EIA
Miss an analysis of how many that will need a connection over the river
The investigation is to limited, need a bigger overview

This is a big group that are not happy with any of the alternatives presented by the municipality. These stakeholders think any kind of bridge construction will lead to a severe impact on both the natural and the cultural national interests. Even just a walk and bike bridge will have big visual intrusion and a strong negative impact on the landscape picture. A bridge also threatens the biodiversity with many unique species at risk, and brings in a lot of noise to a former quiet area affecting both natural and recreational values. These stakeholders clearly think the minimal improvements you gain in accessibility are not worth the irreversible damage it will give to the environment. Årike-Fyris is probably the most valuable nature area close to town, and is strongly suggested to become a nature reserve, which not is compatible with a bridge construction of any kind. Neither will a bridge construction be compatible with the world heritage application. The unique cultural and historical values in the area are also a rich resource for Uppsala and its tourism both for now and for the future and we have a responsibility to preserve those values for future generations as well. Any kind of constructions will also be a threat to the ground water and to the arable land at Ultuna and leads to a higher acceptance for more constructions in the area.
Shorter travelling only a speculation
According to the traffic models, shorter travel distances is only a speculation, since there been proved several times that that if a new car road is built the car traffic will increase. That will contribute to a negative impact on the climate and does not work well with the sustainable future these stakeholders are working for. Another thing mentioned is the fact that a new road only will be 2 km from the already present Flottsundsbron, which means that the saving in time will be around three minutes with the new bridge. Putting that in contrast to all the natural and cultural values that will be destroyed, a bridge does not seem to be such a good solution.

Need to include a broader view in the planning process
This group think the planning process can be improved as well. There is not much mentioned about how the sea traffic will be affected for example. The bridge must be able to open for the sea traffic, which will be in conflict with the public transport going over the bridge with the time tables they have to follow. Neither are there any proper investigations of how many that will need this connection and about the potential of a train station in Bergsbrunna, which is an essential part of the project and should be present in the planning. They also argue that other alternatives than those four presented should have been included in the planning. For example if you lead the road around the city, the city will be more attractive for walking and bicycling. The possibility of using Vindbron as a walk and bike bridge and the alternative with building a tram system through the town should also have been considered in the investigation.

This group strongly suggest these alternatives as options as well:

- Broaden Kungsängsleden and make it to four lanes instead of two.
- Improve Flottsundsbron or replace it with a high bridge, it would give less impact on the surrounding environment and be favourable for the sea traffic as well.
- Make Vindbron to a walk and bike bridge.
- Investigate the possibilities for a tram system with routes from Gottsunda and Sävja towards Resecentrum in the city. It would relieve the pressure over Resecentrum and be a more long term sustainable solution than a trafficked bridge.
- Build more tram lanes between Uppsala – Stockholm.
6.4 Story line 4 - The knowledge base is inadequate

Table 5. Arguments from those how think the information to take a stand are too poor (Armandt, 2014, Länsstyrelsen, 2014).

<table>
<thead>
<tr>
<th>Environmental impact</th>
<th>Main arguments</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural values</td>
<td>Do not present how they can meet the national natural interests enough&lt;br&gt;How it will affect ecosystems and birdlife must be further investigated&lt;br&gt;Not clear how rare spices will be protected&lt;br&gt;Not clear how the construction can work together with the planned nature reserve&lt;br&gt;The values of ecosystem services should be illustrated better</td>
<td>Länsstyrelsen Uppsala län, SGU, Bergsbrunna egnahemsförening, Samfällighetsföreningen Nåntuna-Tunis</td>
</tr>
<tr>
<td>Cultural values</td>
<td>Do not present how they can meet the national cultural interests enough&lt;br&gt;The formation of the whole road (not only the bridge as the EIA says) and the noise- and erosion protection formations are important for how it will affect the cultural values</td>
<td>Länsstyrelsen Uppsala län, SGI</td>
</tr>
<tr>
<td>Recreational values</td>
<td>A walk and bike bridge will increase the recreational value</td>
<td>Länsstyrelsen Uppsala län</td>
</tr>
<tr>
<td>Landscape picture</td>
<td>The formation of bridges, roads and protective measures needs to be known before it can be judged to be approved according to the landscape picture protection</td>
<td>Länsstyrelsen Uppsala län</td>
</tr>
<tr>
<td>Land and water</td>
<td>Not enough facts to judge the risk of puncture Ultuna källa&lt;br&gt;The information given at date is fundamentally flawed in a hydrological perspective&lt;br&gt;No decision can be made before the hydrological conditions and consequences are further investigated&lt;br&gt;Damage prevention actions for contamination of the groundwater should be included&lt;br&gt;The document should be complemented with possible landslide or collapse risks&lt;br&gt;Description of contaminated ground is missing&lt;br&gt;Do not mention the marine impact</td>
<td>Länsstyrelsen Uppsala län, SGI, SGU, Sjöfartsverket, Uppsala vatten</td>
</tr>
<tr>
<td>Noise</td>
<td>Bring noise to a former quiet area, the consequences of that need to be explained further</td>
<td>Länsstyrelsen Uppsala län</td>
</tr>
<tr>
<td>Climate effects</td>
<td>The expected effects from a changing climate are not included in the calculations (e.g. bigger flooding risk)</td>
<td>SGI</td>
</tr>
<tr>
<td>Construction problems</td>
<td>Need to investigate tram taxi more – too untried</td>
<td>Samfältighetsföreningen Nåntuna-Tunis</td>
</tr>
<tr>
<td>Planning process</td>
<td>Should include other possible alternatives as well&lt;br&gt;Need to present how the plan interacts together with the rest of the regional urban development&lt;br&gt;Alternative zero is not presented enough&lt;br&gt;Need to have a longer time perspective&lt;br&gt;How the construction meet the regional development goals is not presented&lt;br&gt;Need to know if a train station will be built</td>
<td>Länsstyrelsen Uppsala län, Bergsbrunna egnahemsförening, Bergsbrunna vägförening</td>
</tr>
</tbody>
</table>

The main concerns from this group are according the possible negative impacts towards the ground water and the natural values which both are too inadequate investigated in the environmental impact assessment.
Too little information of the environmental risks
This group of stakeholders thinks that the impact on the ground water needs to be further investigated in order to get a better picture both of the contamination risk and of the risk to puncture Ultuna källa. They also think that how the storm water will be handled is not clear enough in order to be able to make a good judgement of the environmental impact. In addition to that the risk for erosion and landslides need to be investigated further to be able judge the safety of the construction and in the construction plan a description of contaminated ground is missing. According to the natural values the value of the ecosystem services, the protection of red listed spices and how a bridge can be compatible with the planned nature reserve is not showed clearly enough to be able to make a decision about it. Until all these uncertainties are presented clearer the opinion of this group is that there is no point to continue with the detailed layout plan.

The investigation has been a too simplified
The whole investigation is too simplified, even though it is an early stage the consequences will have to be more concretized in the further planning. The construction area cannot be seen as an isolated area as in the detailed layout plan. The urban development needs to be included on a broader scale and should show how the project will interact together with other projects in a longer time perspective. Some stakeholders also ask for more background analyses, like a child consequence analysis and a heath consequence analysis for example, which should be complemented with the economic analyses. These stakeholders are also critique against the noise investigation. It does not calculate with the flat terrain of the landscape which can have a significant impact on the noise levels and they also think it would be interesting to see the change in noise at different speeds and when spikes tires are used. More knowledge about how and if the train station in Bergsbrunna will be built will also be needed before there is any idea of proceed with the decision making process, since all alternatives are effected by that. The alternative PRT should be investigated further as well, since it is so untried. In addition to that a better explanation of the zero alternative and more alternatives besides those four presented should be investigated and included in the plan. Alternatives mentioned by the stakeholders are the alternative of building a tram system and the alternative of an expansion of Kungängsbron and/or Flottsundsbron.

6.5 Discussion
From the different story lines two main conflicts can be seen. One is between the social values and the environmental values, which are in a clear conflict with each other. One group rank the social and economic interests higher than the conservation values, while another group has the opinion that the environmental damage the construction will cause not is acceptable for the relatively small socio-economic gain it will give according to time and accessibility aspects. The other big conflict lies within the goal of the project and how to handle future transport planning, were one group want it to lead to increased accessibility and limited travel time, the other group are working for a change in the transport behaviour, which a bridge adapted for traffic would work directly against and can be seen as a conflict between the conventional transport approach and the sustainable mobility approach (Banister, 2008), which will be further discussed in the next section. What also comes up from these story lines are the dissatisfaction with the planning process which is seen as not being adequate enough to handle the difficult and important sustainability issues that are being faced.
7. Evaluation of the story lines

In this section an evaluation of the story lines will be carried out. By using Banister’s framework on sustainable mobility the conflicts between these contesting stories will be highlighted and the political dynamics will be explained in more detail. In the end some recommendations for practice both for this case and for other cases in the future will be presented.

Table 6. An overview of the story lines compared against each other in Banister’s framework over the conventional approach of transport planning and the new sustainable mobility paradigm.

<table>
<thead>
<tr>
<th>The conventional approach - sustainable mobility</th>
<th>An alternative approach - sustainable mobility</th>
<th>Story line 1 - A bridge without car traffic is a good solution</th>
<th>Story line 2 - A car bridge is a good solution</th>
<th>Story line 3 - All alternatives are bad</th>
<th>Story line 4 - The knowledge base is inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical dimensions</td>
<td>Social dimensions</td>
<td>Mix of conventional and alternative approach</td>
<td>Physical dimensions more important</td>
<td>Thinks more about the social dimensions</td>
<td>Thinks social dimensions needs to be considered</td>
</tr>
<tr>
<td>Mobility</td>
<td>Accessibility</td>
<td>Mix with a change towards accessibility</td>
<td>More towards mobility</td>
<td>Accessibility</td>
<td>Want both mobility and accessibility</td>
</tr>
<tr>
<td>Traffic focus, particularly on the car</td>
<td>People focus, either in (or on) a vehicle or on foot</td>
<td>People focus</td>
<td>Traffic focus, mainly on the car</td>
<td>People focus</td>
<td>Not necessary a focus on cars</td>
</tr>
<tr>
<td>Large in scale</td>
<td>Local in scale</td>
<td>Local in scale</td>
<td>Large in scale</td>
<td>Local in scale</td>
<td>Not clear</td>
</tr>
<tr>
<td>Street as a road</td>
<td>Street as a space</td>
<td>Changing towards street as a space</td>
<td>Street mainly as a road</td>
<td>Street both as a space and a road</td>
<td>Not clear</td>
</tr>
<tr>
<td>Motorised transport</td>
<td>All modes of transport often in a hierarchy with pedestrian and cyclist at the top and car users at the bottom</td>
<td>Prioritise pedestrian and cyclists</td>
<td>Rank motorised transport highest</td>
<td>Want to get away from the focus on cars</td>
<td>Depends on the environmental impact</td>
</tr>
<tr>
<td>Forecasting traffic</td>
<td>Visioning on cities</td>
<td>More towards visioning</td>
<td>Forecasting traffic</td>
<td>Visioning on cities</td>
<td>Not clear</td>
</tr>
<tr>
<td>Modelling approaches</td>
<td>Scenario development and modelling</td>
<td>More towards scenario development and modelling</td>
<td>Use modelling approaches</td>
<td>Scenario development and modelling</td>
<td>More towards scenario development and modelling</td>
</tr>
<tr>
<td>Economic evaluation</td>
<td>Multicriteria analysis to take account of environmental and social concerns</td>
<td>More towards a multicriteria analysis</td>
<td>Economics more important than environmental and social concerns</td>
<td>Have a multicriteria analysis – care about both environmental and social concerns</td>
<td>A mix – clear environmental and social analysis are needed as well as economic evaluation</td>
</tr>
<tr>
<td>Travel as a derived demand</td>
<td>Travel as a valued activity as well as a derived demand</td>
<td>Towards travel as a valued activity</td>
<td>Travel as a derived demand</td>
<td>Towards travel as a valued activity</td>
<td>Not clear</td>
</tr>
<tr>
<td>Demand based</td>
<td>Management based</td>
<td>More management based</td>
<td>Demand based</td>
<td>Want it more management based</td>
<td>Not clear</td>
</tr>
<tr>
<td>Speeding up traffic</td>
<td>Slowing movement down</td>
<td>Want to slow the traffic down – less cars</td>
<td>Speeding up traffic – increase capacity</td>
<td>Slowing movement down – work against increased traffic</td>
<td>Not clear</td>
</tr>
<tr>
<td>Travel time minimisation</td>
<td>Reasonable travel times and travel time reliability</td>
<td>Travel time minimisation not the most important</td>
<td>Travel time minimisation very important</td>
<td>Travel time minimisation not the most important</td>
<td>Not clear</td>
</tr>
<tr>
<td>Segregation of people and traffic</td>
<td>Integration of people and traffic</td>
<td>Working towards a bigger integration</td>
<td>More towards segregation of people and traffic</td>
<td>Works for a greater integration</td>
<td>Want a better integration</td>
</tr>
</tbody>
</table>
Evaluation of story line 1 - A bridge without car traffic is a good solution
From the analysis of Banister framework it can be seen that story line 1 is going towards wanting a more sustainable mobility. It might not be as drastic as in story line 3, but still it is a step away from the conventional approach. The stakeholders of this story line do not believe that an increased capacity for cars is the solution as the more conventional approach leaning towards. They believe in a more integrated system between people and traffic where walking and biking are ranked higher than driving a car. Even though they still want mobility and the physical dimensions are considered as well they also aiming for making traveling a valued activity and to slow the traffic down. Even if travel time minimisation is preferred it is not the most important, social and environmental aspects have to be valued equal to economic aspects.

Evaluation of story line 2 - A car bridge is a good solution
From the analysis story line 2 can be seen as a clear case of the conventional approach. Their focus mainly lies upon the physical dimensions were mobility and motorised transport has an important role. The travelling is seen as a derived demand and using forecasting traffic models is believed to solve the capacity problems that lie ahead. These stakeholders have a more socio-economic than environmental approach, were the socio-economic al good the road will bring are ranked higher than the environmental loss it will cause. They see the street as more of a road than a space, but a road that will lead to travel time effectiveness, which in turn will lead to a better environment (less pollution), better accessibility and give rise to a greater integration between different parts of the city.

Evaluation of story line 3 - All alternatives are bad
Story line 3 is clearly working towards an alternative approach and a more sustainable mobility. This group of stakeholders are thinking in new directions away from the conventional approach. They do not want to see the street as a road instead they want the transport system to be a space where people and traffic can integrate in a good way. Social and environmental values are at least as important if not more important than the economic values in order to reach a sustainable mobility. By making the travel more of a valued activity than a derived demand and put a greater focus on walking and biking than cars, the traffic can be slowed down and a more sustainable city can be reached. To get there these stakeholders do not believe that forecasting traffic or modelling approaches demand based by the traffic will work. Instead they believe in management based traffic where the visioning of cities with development and modelling are the way to go based on other criteria’s than car traffic.

Evaluation of story line 4 - The knowledge base is inadequate
Story line 4 is hard to place in any of the approaches since more knowledge is wanted about the consequences of the construction before this group of stakeholders can say what they think is the best in this case. But what can be seen from analysis is that this group seems to be open to a more sustainable approach if the conventional approach cannot reach their satisfaction and maintain good social and environmental values. They do not see it as a necessity to put the car in focus or go by the old transport models and thinks it is very important that all possibilities are investigated properly before any decisions are made in the case.
Summary
The analysis shows that in order to shift towards a sustainable mobility paradigm, story line 2, promoting a car bridge should not be selected. Story line 1, which promotes a bridge without car traffic, can be considered as a step in the right direction as wanting to improve the walking and biking possibilities and diminish the car use, but the story line most clearly working towards a sustainable mobility paradigm is story line 3, saying all alternatives presented are bad. Story line 4 can be seen as a proceeding story line which in the end will become a part of any of the other three story lines depending on the result of a better knowledge of the consequences in the question, but support the arguing of the planning process to be to inadequate when it comes to environmental interests.

7.1 Political dynamics
The evaluation of the story lines shows a conflict in the political dynamics between the different stakeholders. Many interests have to work together such as political, environmental, economical and social interests both in a short-term and a long-term perspective. In story line 2, which follows the conventional approach, the socio-economic values are ranked higher than the environmental. But as seen from the evaluation analysis a big group of stakeholders who do not agree with that prioritising are present. Those stakeholders think that environmental interests should have a bigger influence in the decision making process. In this particular case it seems like the politicians are a bit behind the public in the desire for a modal shift and might be held back by old habits, which are hard to break free from. Political processes are not that progressive and go against the traditional approach could be seen as a very drastic decision by some stakeholders, which makes it harder to implement such a change. That does not mean that it is not possible and also soon necessary. By doing the modal shift in small steps the transition can be smooth and also sceptical stakeholders might easier give their acceptance.

Not all political challenges can be removed, but getting the public’s approval of a change is one important factor that the politicians have the possibility to have influence on, also which people who are involved in the decision making process can have a significant impact on the outcome. It is important to involve people from different fields with expertise in different disciplines, in order to get all aspects covered on an equal level, and to avoid ranking socio-economic values higher than environmental, as is commonly done. This may not be easy, but by working in interdisciplinary ways the gap between the fields can be reduced, and a greater understanding of each other’s concerns can be reached.

7.2 Recommendations for practice
The paper has showed that there are many different opinions in this question and the consultations has shown that there is a big public demand for working towards a sustainable mobility paradigm. The recommendations, if a more sustainable mobility wants to be reached, are therefore to go by story line 3 - all alternatives are bad where try to find other alternatives fulfilling the sustainable mobility paradigm better is voted for. If one of the other story lines is to be suggested, story line 1, where a bridge without car traffic would be recommended, since it works towards a sustainable mobility paradigm, but according to the severe environmental impact a construction will have in this particular area it is not recommended in this case. Since story line 2, positive to a car bridge is shown to be a clear case of the conventional mobility paradigm, it is strongly recommended that it is not selected, in view of the need to reach a sustainable mobility paradigm.

General recommendations:

- Have a broader perspective with integration of the whole city in the planning process, by increasing the collaboration between different decision makers and different disciplines and use other methods in the planning process (e.g. SEA) that consider environmental issues in an earlier stage and at the urban scale.
Try to look beyond the conventional approach and be inspired by the sustainable mobility paradigm. Change the transport vision away from a car-focused system and work towards a more people-traffic integrated system were walking and biking is in focus instead of the car.

Involves the public more in the question to gain acceptance for change for example by improved communication and better information in an early stage.

Of course a modal shift like this will not be easy. People involved in the planning process are surely aware of the need for sustainability, but are still working in another direction due to other interests present as well. There therefore needs to be some kind of change in the politics. How to obtain that is not easily known and can be a target for further research. However some key points for being able to look beyond the conventional approach and slowly change the politicians' thinking towards a more sustainable approach could involve more information and better education in the subject of sustainable development, in order to gain a greater knowledge, which can lead to greater acceptance of more radical environmental decisions as well. Extended collaboration between different disciplines, which will lead to more points of view being present and hopefully decisions made on a better basis can be carried out. Last but not least implement new more sustainable methods in the planning process, in order to get a broader perspective of alternatives possible in the political issues.

Recommendations in this particular case:

- Make further investigations on the environmental impacts before any more decisions in the question are made.
- Investigate other alternatives beyond those in the layout plan, as suggested from the consultations and presented in the story lines.

The decision in this question can be a milestone towards a more sustainable paradigm and set the agenda for future decisions and policy makers and be an inspiration for other cities as well to think beyond the conventional paradigm and start to think in more long-term sustainable terms. The shift will, and have to take time in order to gain the public acceptance, but it is a necessary step in the right direction towards a more sustainable city where the car is not in focus and walk and bike routes are integrated in a good way together with the green areas in the city. For the future a fifth proposal should be presented, which could be based on an SEA made in the question in order to gain more alternatives and get some concrete suggestions of what those other alternatives could be.
8. Conclusion

The issue of transport planning is a very complex question, where many stakeholders have to work together. This makes it very important that the political dynamics are evaluated and the considerations of all stakeholders are taken into account. In this case the decision making process has not been fully satisfying and environmental interests have been diminished in favour for socio-economical interest. Avoiding that is not easily done, but by using a strategic environmental assessment (SEA) instead of an ordinary EIA, the environmental impacts will be considered in an earlier stage of the planning process and more sustainable alternatives has the chance to be reached.

From the story lines created, four different groups of opinions were identified and the disagreements between these groups could be seen and compared in terms of a conflict between the old conventional transport paradigm and the new sustainable transport paradigm. The evaluation showed whether the different story lines were working towards a sustainable paradigm or not. The result showed that the story line that all alternatives presented are bad was the one most in line with the sustainable mobility paradigm and the story line promoting a bridge without car traffic was going in the direction towards a changed paradigm. However the story line positive to car traffic was identified as going by the conventional approach and the story line thinking the knowledge base is not enough was hard to place in any approach, but instead highlighted the problems of the poor planning process.

The main conclusion of this study is therefore that the decision making process has not been able to adequately handle the complexity of the sustainability challenges in this case. This led to inadequate alternatives in the planning process that are not adequate enough to reach a sustainable mobility paradigm and a sustainable urban development and other options should be looked at.
9. Acknowledgement

I want to thank my supervisor Tim Richardson for necessary guidance and encouragement during the way. I also want to thank my evaluator Per Hultén and Naturskyddsforeningen for introducing me to this case and for showing interest and support during my work. Finally I want to thank the helpful people at Uppsala municipality for providing me with valuable information for my thesis.
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**Interviews**
