Working Paper Series 1:
National Policy, Planning and Funding Context of MUTPS since 1945

Working Paper 1.8

Delivering Swedish transport infrastructure: Past and present policy, planning and financing issues

DRAFT NOT FOR CITATION

Fredrik Pettersson,
Department of Technology and Society, Lund University, Sweden.

Omega centre
Centre for Mega Projects in Transport and Development

A global Centre of Excellence in Future Urban Transport sponsored by Volvo Research and Educational Foundations (VREF)

Content

Delivering Swedish transport infrastructure –
Past and present policy, planning and financing issues.

Acknowledgement

I would like to extend a great thank you to Yngve Boye, who has not only been a great source of information but also have taken a keen interest in the development of the text. He has devoted lots of time and effort by reading the text and making many valuable suggestions for improvements.

1. Introduction

The aim of this paper is to present an overview of the development regarding the planning, funding and delivery of major transport infrastructure projects in a Swedish context. The timeframe will be spanning roughly the last half of the twentieth century to the present, it will however initially be necessary to go back a bit further to provide a context for the post-WWII development. A broad approach is applied that deals with infrastructure policy, planning, funding and delivery in a multifaceted way.

1.1 The planning of infrastructure before the Second World War

The 1940s are in several ways a good starting point when discussing the planning of road, and railway infrastructure in a Swedish context. During this decade some quite significant changes concerning road and railway management were made. These changes concerned and affected the entire organisational structure of the actors involved in infrastructure planning, funding and delivery in a fundamental way.

The main force behind these changes, both regarding railways and road, was the upsurge of motoring which by the 1940s had increased to such a level that the impacts were affecting the infrastructural systems for both car and train traffic.[1] Between 1914 and 1950 the number of cars increased from some 3,000 to more than 250,000.[2] This enormous increase in vehicles resulted in an acute awareness of the need to modernise and adapt the road network for car traffic. The Swedish road network had slowly been developed over the centuries and the majority of roads consisted of narrow, winding, hilly and unpaved gravel roads. During the recession of the 1930s there was a rapid extension of the road network since the government was putting people to work building roads in an attempt to lower the unemployment rate. This contributed to an increase of the road network by 40 % between 1920 and 1940.[3] By 1944 the combined length of public roads added up to some 89,000 kilometres, which is not far from the 98,000 kilometres of today. But of the roads built by 1944, only 4,100 kilometres or 4.6 % were paved.[4]

The effect of the harsh Swedish winter in combination with increasingly heavy car traffic on the unpaved roads was devastating, and resulted in roads in appalling conditions during most of the year. Consequently organisations looking out for the interests of motorists had for quite some time been arguing for a reformation of the road network management system. The main problem with the system was perceived as a lack of central organisation. The responsibility for the upkeep of the roads had traditionally been in the hands of the local landowners, in essence often the farmers in the countryside. These landowners were by law forced to maintain the stretch of road that lay within borders of their lands. If the road in question was deemed important a certain amount of financial support from the state could be forwarded. Beginning in the 1920s a number of reforms, such as taxation on vehicles and petrol were introduced. The revenues from these tax systems were channelled back into the road

[1] Kaijser (1994: p. 12) This development was however momentarily halted during the war years which saw a drastic decrease in the number of vehicles in traffic. The main reason was a critical shortage of fuel due to an almost complete blocking of the oil import. The vehicles still in traffic, mainly trucks and busses, almost exclusively relied on producer gas (wood gas).
[2] Modig (1991: p. 228).
[3] Kaijser (1994: p. 153)
[4] Turesson (1991: p. 187)

management system via regional actors organised in "road districts". Gradually this led to a system shift where the costs for maintenance of the roads were attributed to the motorists instead of the landowners.[5]

In the early 1940s an official report ordered by the government recommended the creation of a state controlled public road network, comprising the most important roads in the country. The main arguments for this were cost efficiency, cost distribution and coherency regarding technical specifications for road building and maintenance. The coming of the age of the car meant that roads no longer were a matter of local interest given the higher rate of mobility the increased travelling speeds implied.[6] In 1944 the recommendation was followed and the responsibility for majority of the public roads was brought under the control of the Swedish road administration (Väg och Vattenbyggnadsstyrelsen), a state authority formed one hundred years earlier. The roads in the cities were however often exempted and the responsibilities for these were still in the hands of about one hundred larger municipalities.[7]

The increasing amount of cars also had a great effect on the infrastructural system of the railway. The development of the Swedish railway network from the last half of the nineteenth century was characterised by a mixture of actors working on different geographical scales. The main network in the country was built and operated by the state – while private actors built and operated regional and local networks.[8] The great involvement of the state in the building of railway infrastructure, which by an international comparison is somewhat unusual, is to a large extent explained by the fact that late nineteenth century Sweden was a spatially large, relatively poor and sparsely populated country. There was simply not enough private capital willing to get involved in railway enterprises covering the entire nation, even though the market was deemed lucrative. Moreover, the geographical characteristics of Sweden, totally dominated by the north – south expansion of the territory, made the railway network a very important part of the defence system, and thus the planning of the location, and the routes of the railway lines was deemed too important to leave in the hands of private interests. Additionally the railway was intended to invigorate the economy of areas that lacked efficient transportation routes, thus many of the trunk lines were built where they connected less important (in a national and regional perspective) population centres rather than the provincial "capitals". [9]

The system with the trunk lines of the network operated by the state in combination with private actors running the regional and local parts was working well for quite some time. But by the 1930s the increasing car traffic implied stiffening economic competition for the railway operators. It was especially the private actors running the local networks that were encountering economic problems when the number of cars increased.[10] In 1939 the Parliament decided that SJ (Statens Järnvägar), the Swedish State Railways should take control over all the private railways. This was met with scepticism from the management since it was deemed that it would result in higher ticket fares in general to compensate for the weak economic base of the former private railways. This would in turn lower the competitiveness of the railway in comparison with other forms of transportation – a premonition that would prove to be true in the years to come.

---

[5] Kaijser (1994: p. 152 – 153)

[6] Kaijser (1994: p. 154) is however pointing out that this argument was based on false premises since the average travelling distances at the time very much implied that most of the trips made by car were of a local nature, often covering distances less than 10 kilometers.

[7] Ibid. For an overview of the Swedish planning system see appendix 1.

[8] This is however a somewhat simplified division, important parts of the main network was also built by private actors.

[9] Kaijser (1994: p. 146 – 147)

[10] Kaijser (1994: p. 147 & 150)

The pre-world war two developments left a heritage that greatly affected the continued development in the last half of the 20th century. This heritage can be characterised as both "hard" and "soft". The former category implies the physical characteristics that are a result of decisions made a long time ago that still reverberates in the infrastructural systems today. The trunk lines of the railway network are still to a great extent running along the same routes, although extensive work to upgrade the qualitative aspects has been made. The towns and small communities that were formed around the train stations are still there although the last train sometimes left the station 50 or more years ago.

The latter "soft" category implies the institutional and organisational heritage that by way of legislation and organisational structure has been equally important. A part of the soft heritage is the structure of the infrastructure organisation which can be labelled "the Swedish model".[11] This model rests on the often close cooperation between public and private actors during the development stage of the infrastructure system. Even though the state eventually came to dominate the administration and operation of the two infrastructure systems discussed above, plenty of leeway was still left for cooperation with private actors on a regional and local scale. Thus there is perhaps more than a coincidental connection between the success for domestic technological industries for example concerned with the manufacturing of heavy equipment for road and railway construction, signal systems for traffic control, power supplies for the electrification of trains – and the development of infrastructure systems.

2. The transformation to a car centred society

The end of the Second World War heralded the starting point of an era of strong economic growth in Sweden. Since Sweden was left untouched by the destruction of the war the domestic industries had a very good position in the early 1950s when the international economy picked up again. The economic growth is not least visible in the virtual explosion of the number of vehicles. The number was more than tripled in ten years, from 337,407 in 1950 to 1,315,768 in 1960 (see table 1.) The rate of cars per 1,000 residents thus virtually soared during the 1950s and for a few years Sweden had the highest rate in Europe and was only surpassed by the USA, Canada and Australia in a global perspective.[12]

2.1 The development of the road network

The extension of the road networked continued during these two decades, albeit at a slower pace compared to the period between 1925 and 1940. The big difference was however the great effort aimed at raising the quality of the roads. As mentioned earlier less than 5 percent were paved in 1944 when the public road network was brought under state control. By 1970 the combined length of the public road network added up to 98,050 kilometres of which 26,381 kilometres consisted of paved roads – thus the relative share of paved roads increased by a factor of 5, or in absolute terms by more than 20,000 kilometres in twenty years.[13] The number of bridges and viaducts also increased substantially, 530 bridges and 615 viaducts were built between 1950 and 1970 which resulted in an increase of both accessibility and safety.[14] In 1953 the first stretch of four-lane motorway between Malmö and Lund was completed and in the years to come more and more of the main routes in the road network would be transformed. By 1970 some 376 kilometres had been turned into motorway. So even

[11] Ibid: p. 13
[12] Blomkvist (2001: p. 18)
[13] Castensson (1991: p. 235)
[14] Ibid.

though the combined length of the public road network only increased fairly modestly (in absolute and relative terms) compared to decades before the Second World War, the qualitative improvements were massive, and as such the 1950s and 1960s can truly be seen as the road building decades.[15]

Year	Number of cars (including lorries)[16]	Passenger cars per 1000/residents [17]	Paved roads (km)[18]	Road-network (km)[19]	Motorways (km)[20]	Railway network (km)[21]
1950	337,407	36	5,215	90,409	0	15,516
1960	1,315,768	159	8,196	93,481	54	15,219
1970	2,432,231	283	26,381	98,050	376	12,203
1980	3,064,531	347	57,852	97,614	809	12,006
1990	3,911,000	419	69,819	98,548	1,032	11,193
2000	4,373,000	450	N/A	N/A	N/A	11,037

Table 1 Quantative measures of the transport system development between 1950 - 2000[22]

2.2 The railway: network and administration from 1950 and onwards

While the road network increased in extension as well as importance during the immediate post-war period, the opposite was in many ways true of the railway network. By the end of the 1930s the combined length of the railway network added up to some 16,900 kilometres.[23] As mentioned earlier this network was brought under state control in 1939 and the increasing competition from car traffic meant that the local and regional routes faced big problems with dwindling customer potential. The effect of this was a steady decrease of the length of the railway network. Between 1950 and 1970 around 3,000 kilometres of railway was closed down, mainly in the southern and central parts of the country.[24]

The traffic legislation of 1963 (1963 års trafiklagstiftning) also signalled a will to political reformation in ways that implied even harsher conditions for the railway. From the 1920s and onwards the tendency toward centralism and strict regulation of the transport sector had been steadily increasing, perhaps a result of recessions and a volatile international political climate. But during the prosperous 1950s new ways of thinking came to the fore, the new lead words were competition, business economics and profitability. A strong belief in liberalisation and

[15] Westlund (1996: p. 64)
[16] Statistics Sweden (2008a)
[17] Ibid.
[18] Castensson (1991) No comparative data available for the year 2000. See footnote 21 for a further explanation.
[19] Ibid.
[20] Ibid.
[21] Statistics Sweden (2008b)
[22] The quantitative measures of paved roads, road network and motorways are only concerned with the development of public roads under direct state control. There are also a further 37,000 km of municipal roads and streets. If "public roads" means a road in principal open to public motor traffic, an additional length of about 75,000 km of private roads supported with state grants ought at least to be included. In addition, there are also other private roads supported by the municipalities and open to the public. The registered total length of private roads is about 284,000 km of which about 150,000 km has been built for forestry purposes. Due to several changes of the status of roads, as well as changes concerning which administrative level is responsible for the upkeep, the figures presented in the table should be seen as indicative rather than absolute. The decrease in length in the column road network between 1970 and 1980 is for instance due to an administrative change, where the responsibility for maintenance for certain roads were shifted from state- to municipal level.
[23] Kaijser (1994: p. 149)
[24] Hölcke (1986: p. 142 - 143)

the "market forces" implied that the state should not be involved since this would hamper the development. An interesting point is that this liberal line was actually put forward and defended by the reigning social democrats, often in opposition with the non-socialists of the "middle parties".[25]

The reforms were also welcomed by the officials within the Swedish State Railways. A big problem for this state owned company was that the revenues of operations were expected to meet the costs while they simultaneously were expected to uphold service on non-profitable lines. As a consequence they had to charge higher fares on the lines where they actually had a good customer potential, which in turn further weakened the competitiveness compared to other modes of transport (mainly car, but also increasingly air traffic).[26] One consequence of the reform was that the demand to maintain traffic on non-profitable line was lessened and as a result the rail network saw a drastic decrease. The remaining railway network was further divided into two parts; one "business network", ran on businesslike principals, and a "deficit network", subsidised by the state. The decrease of the railway network was slowing down during the 1970s, due to a different political climate and new factors such as emerging environmental concerns and a focus on safety in transportation politics. But in 1979 the parliamentary decided to further rationalise the railway system since the subsidies were very costly. This resulted not only in the closing of almost a thousand kilometres of railway, but it also initiated debate about how to make the railway a competitive, profitable transport sector.[27]

In 1988 the railway organisation was divided into two separate entities. The Swedish State Railways (Statens Järnvägar) retained the responsibility for running the traffic, while the responsibility for running and maintaining the rail network was shifted to the Swedish Rail Administration (Banverket), a newly created state authority. While the Swedish Rail Administration was funded through state grants, the emphasis on businesslike principals and profit making was clearly emphasised within the Swedish State Railways. "The railway system would no longer be a cumbersome colossus sustained by state subsidies, transporting people and cargo according to obsolete models and with technology from the 1950s. Trains should become fast and modern, traffic thus meeting the demands of customers with different needs and preferences."[28]

Since the 1990s a lot of effort has been aimed at raising the quality of the railway network and for the first time in over 50 years construction of new tracks have been taking place (this is however not evident from the figures in table 1 since some tracks were being shut down simultaneously). The lack of adequate legislation regarding new construction of railways was soon becoming apparent to the concerned authorities. Existing regulations were especially inadequate regarding land acquisitions, environmental issues and citizen participation. In 1996 a new railway act (consisting of the Law concerning the building of railways and Ordinance concerning the plan for main railways) was therefore passed.[29]

The current planning system of the Swedish Rail Administration is based on the Trunk Net Plan, a running ten-year plan revised every three or four years in order to address the issues pointed out in the Parliaments latest resolution for the overall transport policy. According to the new legislation the planning for new railways should follow five distinct steps. 1. The main line plan. 2. The preliminary study. 3. The railroad investigation. 4. The railroad plan. 5.

[25] Wedin (1982: p. 11 - 12)
[26] Ibid: p. 84
[27] Binde (2000a: p. 29)
[28] Ibid: p. 30
[29] For an overview of the Swedish planning system and its main elements see appendix 1 - 4.

Detail planning. Each of the five steps is to insure that the siting and the design of the railway are carried out in a manner that meets established environmental and democratic standards.[30]

2.3 The role of infrastructure development

Some interesting points can be made by making a comparison between the development of the road network in the 1950s and 60s and the extension of the railway network a century earlier. The building of the railway network in the mid 19th century was a politically motivated project with an outspoken goal of strengthening the regional economic development of the country. The massive improvement of the road network was also justified in economic terms. But the very strong economic development of the 1950s and 1960s meant that the main role intended for the road network was not perceived as directly growth promoting as the railway had been a century earlier. Economic growth was not a problem *per se*; so there was simply no need for infrastructure projects to play this part.[31] The improvements were rather seen as a necessity to cater for the spatial restructuring of the industrial and economic base, for instance a strong tendency for specialisation and subcontracting.[32]

The role of infrastructure during the 1950s and 60s was also intimately connected to other agendas concerned with the visions of the "people's home", the social democrat version of the welfare state. As such it had massive impact on the physical structure of the urban areas by way of altering the location patterns for housing, since the new travelling habits allowed for a spatial division between housing and workspaces that previously had not been possible. The development of car related infrastructure was in essence a market driven process and a direct consequence of the rapidly increasing number of cars.[33]

2.4 A road plan for Sweden: international influences and national legislation changes

The fundamental organisational restructuring of the road administration in the mid-1940s greatly increased the possibility of centralised planning. The need for strategic centralised planning was of course accentuated by the swift increase in traffic density, but it was also a heritage from the administrative structures that had been formed during the war years. In the early 1950s work was initiated in order to establish the main needs for the further development. By 1958 this work resulted in *Vägplan för Sverige* (road plan for Sweden), the first plan encompassing the entire nation. This document would be the basis for the infrastructure investments during the following decades.[34]

The plan was greatly influenced by the American "the Inter State Highway System"; a plan for a nationwide network of trunk roads and highways. It was above all three elements in the American plan that reverberated in the debates leading up to the Swedish road plan. Firstly, that income from taxation on motoring should be used for road building. Secondly, that the main population centres should be connected by trunk roads; and thirdly, the great confidence placed in traffic engineering (which was a new scientific methodology of fundamental importance to the American plan).[35] The introduction of the science of traffic engineering was

[30] Binde (2000b)
[31] Westlund (1996: p. 64 - 65)
[32] *Vägplan för Sverige* (1958: p. 32)
[33] Castensson (1991: p. 237)
[34] Kaijser (1994: p. 155)
[35] Blomkvist (2001: p. 139)

keenly advocated by the Swedish road federation (Svenska vägföreningen) the domestic branch of the International Road Federation (IRF), and they tried to influence authorities and universities to adopt the new techniques. The lobbying was quite successful and thus the work leading up to *Vägplan för Sverige* was highly influenced by the methods and strategies of traffic engineering as these were presented in the early editions of *The Highway Capacity Manual*.[36]

The planning regime in the Swedish road administration, the state authority ultimately responsible for the planning was characterised by a technocratic vision of development where the decision processes were founded on a combination of rational scientific reasoning and a strive for social reformation where increasing motoring was viewed as something positive. The influence of traffic engineering on the planning processes was palpable. The overarching strategy was to "`predict and provide´" and the generic strive of the different methods and techniques of traffic engineering was that "`[a]ll traffic demands should be met´"[37] This has by some commentators been called "a system building culture" and the main individual actors in this corporativistic culture were high officials within the administration ranks, leading politicians and representatives from trade unions and private enterprises.[38] But it is however also important to acknowledge that this development could only take place because it enjoyed massive public support. In the visions of the future, the car was viewed as a positive, democracy enhancing force. This view did not change until the negative sides of the car centred society, such as pollution, congestion and accidents, became apparent.[39]

A consequence of the technocratic nature of the planning regime was that planning matters gradually transferred from the realm of politicians to a realm of "experts", mainly concerned with for instance technical aspects of road planning. It was believed that the experts, often (but not exclusively) engineers, could provide an objective, scientifically grounded rational solution to conflicts between different interests. In the long run this would result in a society rid of the old conflicts emanating from the class struggle. This "planning optimism" permeated many areas of Swedish post-war society concerned with social planning, even to the extent that it was made official policy by the social democratic party.[40]

Apart from the work leading up to the *Vägplan för Sverige*, two other important changes would be formative for the future development; the traffic legislation of 1963 (1963 års trafiklagstiftning) and the right-hand traffic reform of 1967. As previously mentioned the former legislative change signified a major shift in the competitive conditions between road and railway transports where protective measures formerly favouring the railway transports were removed. The right-hand traffic reform of 1967, which of course had enormous practical implications, also resulted in that the process of closing down tram lines in several cities were sped up.

Another new element introduced in the road network in the 1950s was the administrative creation of a network of trunk roads similar to the trunk lines of the railway network. The trunk roads were deemed of certain importance since they on a national as well as regional level were connecting the most economically important areas of the country. They were also meant to connect the Swedish road network to the increasingly important international transportation routes.

By 1962 the so called E-numbers were introduced for the trunk roads that connected to the European road network. The connection of the Swedish and European roads was regulated by an ECE (Economic Comission for Europe) declaration, ratified by Sweden in 1952 that

[36] Ibid: p. 174 & 176.
[37] Ibid: p. 181
[38] Blomquist & Jacobsson (2002: p. 19)
[39] Gullberg (1990: p. 65)
[40] Blomkvist (2001: p. 133 & 141 – 143)

contained norms for technical specifications and traffic sign standardisation. An overarching strategy of the *Vägplan för Sverige*, was to connect internally, as well as adjust, the trunk roads in the Swedish road network to meet the demands of the ECE declaration.[41] The planning ideology that influenced *Vägplan för Sverige* can thus be characterised as physical and functionality centred. This is not least visible in the great effort put into establishing the hierarchy and function of the road network. The function of a certain road regarding connectivity and technical specifications (based on traffic predictions), followed from the established hierarchy of roads (i.e. European, national, regional and local).[42]

2.5 Mega Urban Transport Projects (MUTPs) in Stockholm from 1950 and onwards

To summarise the general development of the road based transport infrastructure during the 1950s and 1960s one can say that it was characterised by a large number of smaller projects, such as widening, straightening and paving the roads of the countryside. But the development in the major cities was also extensive and there are certainly quite a few projects that could be discussed, but given the limited space only a few will be mentioned.

A major contributing factor to the need for improvements of the transport systems in the cities was the intense urbanisation process that took place during these decades. The share of city dwellers in Sweden rose from 65 % in 1950 to 81 % in 1970.[43] This massive increase in combination with the equally massive increase of cars did of course imply a great challenge for the planning and building of transportation systems and new housing.

The development in Stockholm points to both generic as well as context specific tendencies. A number of different measures were taken that were perceived as solutions to the mounting transportation problems, and the planning regime in Stockholm during the two immediate post war decades provides a good example of the planning optimism that permeated Swedish society. One part of the solution to the congestion and housing problems was to build a number of new satellite towns, connected to the central city by subway and road networks. The building of the subway was an exceptional event in a Swedish context; in fact it would be the only major railway based transport system project for several decades. But it was very crucial to the decentralised spatial structure, where the new satellite suburbs would be strung "…like beads along the lines of a new subway system"[44] The cost for building the subway was substantial, since the first line opened for traffic in 1950 until the completion of the basic network during the 1960s, more than one billion Sek were spent.[45] Some additional lines have also later been added to the network.

[41] Blomkvist (2001: p. 137)
[42] Interview with Yngve Boye 071011
[43] Hall (2002: p. 335)
[44] Ibid.
[45] Ibid: p. 338 Prices not adjusted for inflation.

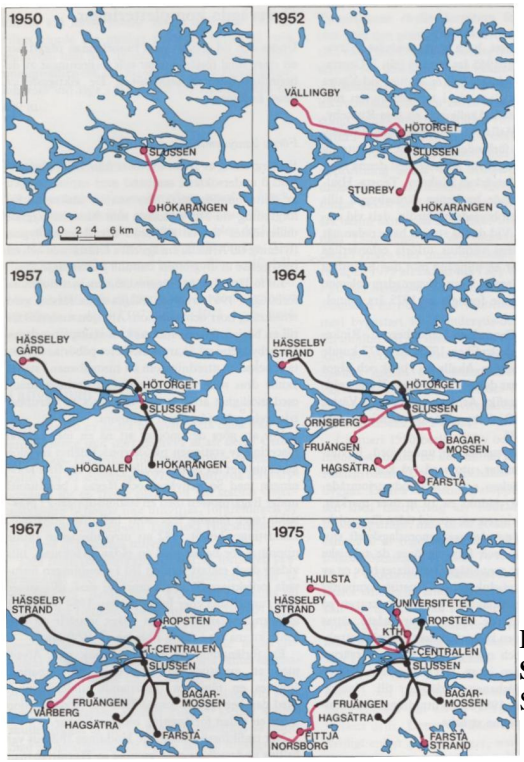

Figure 1 The expansion of the Stockholm subway system over time.
Source: Dufwa (1986: p. 236)

With the notable exception of the subway in Stockholm, the overall vision that informed infrastructure planning during these decades was that of a car centred society. The general view was that the tendency towards a greater car density was a desirable as well as an unstoppable development. The future probability of 650 cars/1 000 individuals was neither seen as unrealistic, nor as excessively problematic as long as measures were taken in time to develop the infrastructure in suitable ways. Thus the planners believed that there would only be a limited need for public transport in the future, basically just enough to service the 35 % of the population (people under 18 and the elderly) that did not have access to a car.[46]

As a consequence of this reasoning very ambitious plans were drawn for the extension and remodelling of the road network in and around Stockholm. *Trafikledsplan för Stockholm 1960* (*TfS 60*) presented a plan for the traffic route system that would be very influential on the development in the region. The plan, which in turn leant heavily on earlier national and regional plans, was designed in a way that allowed for a gradual accomplishment over a twenty year period and the total cost was estimated to some 2, 6 billion Sek.[47] Figure 2 shows the cover of *TfS 60*, it is quite evident which portion of the proposed extension is deemed essential.

Figure 2 ***The cover of TfsS 60***

[46] Anell et al. (1971: p. 130 ff.)
[47] Skårfors (1999: p. 59) Prices not adjusted for inflation.

Figure 3 The proposed structure in *TfS 60*.
Source: Skårfors (1999: p. 57)

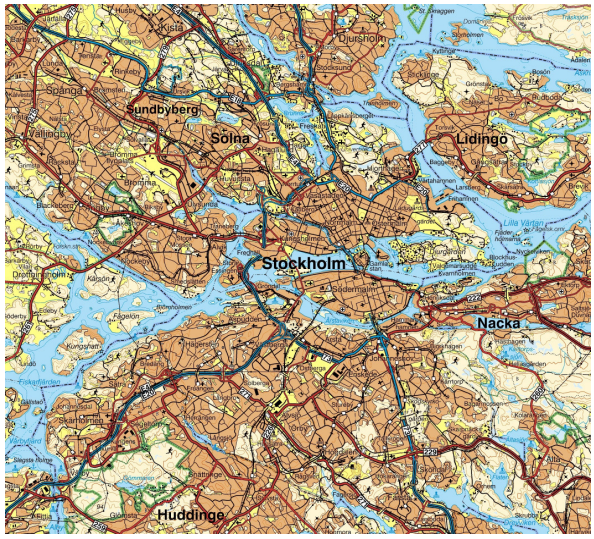

Figure 4 The present structure.
Source: Lantmäteriet

The figures above below illustrate the similarities and the differences between the plan and the actual development. The biggest difference is perhaps the eastern section of the proposed ring road, which is still being investigated and debated. The implementation of the plan meant that the standard of the thoroughfares were upgraded to motorway standard, which represented a new element to the structure of the road network. The idea of traffic separation and a differentiation between regional and local functionality of the roads had been very influential ever since the first general plans for Stockholm were established in the 1940s, and *TfS 60* represented a very palpable step in this direction with a system of six lane motorways and primary and secondary thoroughfares. A foundational premise of the plan was that the main traffic flow should occur between different areas and centres while simultaneously restrict the traffic within these. Most of the approaches (which before *TfS 60* had existed in some form) were built during the 1960s and the early 70s.[48]

Of the proposed ring road, which was the perhaps most important element of *TfS 60*, only a small section in the northeast existed at the time when the plan was presented (and given the proposed standard of six lane motorway, this section was also subject to extensive rebuilding). In 1960 the construction of Essingeleden commenced, a 5 kilometre motorway which was meant to constitute the first section, and the western side of the proposed ring road. In *TfS 60* Essingeleden was meant to be built step by step, and expected date of completion was not set until 1980, but instead a decision was made to build the entire section at once. The motivation for completing the entire section was that it could serve through-traffic as well as traffic between the northern and southern satellite suburbs and the city centre, and traffic in-between the satellites. In *TfS 60* Essingeleden was dimensioned for speeds of 80km/h based on the predicted levels of traffic in 1990. This required between four and eight lanes in different sections *and* that the entire proposed road network would be completed.[49] By 1967 the motorway was completed, to an estimated cost of some 260 million Sek[50]. The budget was exceeded by 30 %, partly due to increasing construction costs and partly due to the time consuming legal procedures for appropriating land and buying existing buildings that had to be torn down.[51] Essingeleden was the only part of the proposed ring road that was completed

[48] Skårfors (1999: p. 46 – 47 & 56 & 79ff.)
[49] Sandström & Ehrman (1966: p. 18 ff.)
[50] Ibid: p. 3 prices not adjusted for inflation.
[51] Sandström & Ehrman (1966: p. 31)

in over three decades. A shift in public opinion and the financial situation meant that other, less costly and less controversial projects had to be prioritised.[52]

It is interesting to notice that the overall capacity of the road network presented in *TfS 60* was deliberately under-dimensioned in comparison to the expected development of the car density mentioned earlier. It was believed that it was possible to cater for an unrestricted traffic increase in the outer parts of the city, where the spatial structure would allow for an effective development of the road network. Thus the car was expected to be the normal means of conveyance for travels within and between the outer parts of the city.[53] The spatial structure of the inner-city did on the other hand mean that restrictive measures in order to decrease car traffic were deemed necessary. To dimension the road network in the inner city after the predictions of car density growth would imply that an unfeasible amount of land would be consumed by roads and parking lots, which in turn would make the city centre unattractive for business. The public transport system was thus a crucial part of the overall transportation system between the suburbs and the centre, and the calculations in *TfS60* were founded on the assumption that on an average half of the daily transports (75 % during rush hours) in these directions would be provided for by public transport.[54]

The public transport systems main characteristics is still the radial structure emanating from the central city, while the connections between the satellites of the outer parts are in essence made up of roads. Travelling between the outer parts of the city with public transport will often imply a detour to the city centre. While Stockholm is often regarded as a positive example of a metropolitan transport system the development since the 1980s, have implied great challenges for the overall transportation system of the region. Increasing population and different settlement patterns implying tendencies toward urban sprawl have put great strain on the road and railway networks.

Increasing congestion and environmental problems of the transportation system eventually lead to political action. In 1992 a "package solution" was presented by a government appointed negotiator. A central part of the plan was a resurrection of the plans for a ring road structure, originally presented in *TfS 60*. In addition the public transport system would be strengthened in various ways, most notably with a light rail system improving connections between the eastern and western parts of the city. The plan was very controversial, not least since the investments in road infrastructure was meant to be financed by inner-city road tolls. After years of debate the "package solution" was finally abandoned, but parts of the plan has still been implemented. The light rail system was completed in 2000 to a cost of some 2 billion Sek (215 million €). In 2004 the "southern link" of the ring road system was opened for traffic after an eight year construction phase. The link consists of 6 km of motorway, of which 4, 6 km are in tunnels. Building in tunnels was considered the only feasible alternative given the dense population in the area, it was also the reason for the substantial cost for completion which amounted to some 8 billion Sek (860 million €). Financing by state granted loans means that the "southern link" is financed by the tax payers since the original idea of financing with revenues from traffic tolls fell through (at present the system with traffic tolls is however implemented, but it is still unclear if the revenues will be used for infrastructure investments). Currently construction of the "northern link" of the ring road is also under way. This 4 km motorway will also to a large extent consist of tunnels and the predicted cost is 7 billion Sek (750 million €). This section of the ring road is expected to be in use by 2015. [55]

[52] Skårfors (1999: p. 122)
[53] Sandström & Ehrman (1966: p. 18 ff.)
[54] Skårfors (1999: p. 59 – 60)
[55] The information about costs in the section above is based on Falkemark (2006: p. 382 ff.) prices not adjusted.

3. The 1970s: The planning regime under a new economic context & emerging environmentalism

By the 1970s the technocratic, planning optimistic visions of the 1950s and 60s were meeting increasing resistance. After the completion of *Vägplan för Sverige* in 1958 it was soon realised that it was economically impossible to deliver all the proposed projects in this plan. At least if the extension was to be guided by the costly principles of *The Highway Capacity Manual*. A new overarching plan was presented in *Vägplan 1970*, which although it leaned heavily on *Vägplan för Sverige*, also signalled a growing awareness of some of the problems of the earlier planning regime (although these were mostly considered as being of a financial nature). The focus of the planning regime shifted from functionality to effect, thus *Vägplan 1970* was not a physical plan, but rather an attempt at establishing principles for which of the projects of the 1958 plan to build in which standard. [56]

During the 1960s a lot of efforts were put into finding better ways of calculating the effects of certain infrastructure projects. By the introduction of profitability assessments attempts were made at trying to put an economic measure of the effect of a certain project. The analyses were exclusively concerned with measuring the effects on the traffic, for instance how a proposed project would affect travelling times, vehicle wear and the likeliness of accidents. These savings would then be compared to the costs involved, and the project showing the best ratio between cost and benefit should be chosen. However, in reality this order of prioritisation was often not followed since other (non-economical) factors often had a great influence on the prioritisation process. Nonetheless it was an efficient way of stopping projects that were excessively expensive, for instance due to exaggerated demands of standard where it was uncalled for.[57]

The results of the models, as well as the underlying assumptions for the calculations that were presented in *Vägplan 1970* did however come under increasing attack from different actors during the 1970s. The critics were calling into question a number of things. An overarching critique concerned the general transformation to the car centred society, which increasingly was viewed as problematic, at least in the larger population centres where space consuming car infrastructure, noise levels, accidents and barrier effects became concrete (literally as well as figuratively) problems.

Some critics were also claiming that the applied planning methodology rested on the fundamental principle that increasing traffic is positive since it increases the socioeconomic revenues (i.e. by lowering costs by time-savings). Moreover, they implied that the entire planning model was thereby concerned with finding the projects that would increase traffic the most since this by default also would increase the socioeconomic revenues. This flaw in the models was a result of the lack of theory. In their view the models of traffic prediction and travelling patterns were for instance only concerned with explaining how, and not why, a certain mode of transport and/or travelling route was preferred over another. There was but little understanding of how the spatial structure affected travelling habits.[58] Even though parts of this critique can be seen as quite simplistic, and perhaps even misleading (for instance the first two sentences of this section), it provides a good example of the reaction against the reigning planning paradigm.

The market liberal approach to traffic policy forwarded in the traffic legislation of 1963 was also criticised by the same authors. The aim of the transport policy was (and still is) that the

[56] Interview with Yngve Boye 071011
[57] Ibid.
[58] Anell et al. (1971: p. 129 ff.)

total transport work should be made at the lowest socioeconomic cost possible. Critics were however pointing to the fact that what constitutes a socioeconomic cost is a matter of definition and given that the models in use were especially poor at reflecting external costs it could hardly be the case that competition in the transportation sector were based on equal terms between different modes of transport. From this point of view the taxation on motoring was to low to cover the external costs caused by this mode of transport, which implied uneven competition. The overall critique was thus concerned with showing how planning models and transportation policies based on ”rational” and “scientific” facts in order to reach an “objective” conclusion as to which projects would bring the most socioeconomic rewards were actually forwarding a very specific agenda catering for the needs of the car centred society.

3.1 Environmentalism and citizen influence

As the political climate became more radical during the 1960s the environmental issues came to play an increasingly important part. The focus on environmental problems caused by motoring was at first mostly centred on the massive spatial transformations that took place when the cities were adapted to the car society. As mentioned earlier this adaptation occurred during a period of intense urbanisation which led to great congestion problems, traffic wise as well as regarding housing. The inner cities of the major urban centres were all heavily modified during these decades. Older neighbourhoods were torn down to give way for new housing and new roads. This development did however not go uncontested; in 1962 the first city environmental group was formed in Stockholm. The members were opposed to the tearing down of old buildings and neighbourhoods in order to transform the cities to meet the demands of the car centred society. Soon groups with the intention to altogether ban cars from the city were formed. [59]

By the early 1970s around 30 city environmental groups existed in Stockholm alone. These were often formed in direct response to the increasing car traffic. The actions taken by these groups, such as demonstrations and petition signings against planned thoroughfares and other traffic enhancing plans were quite successful. In the political realm this meant that the necessities of restricting motoring were brought on the agenda. During the 1970s the tendency toward a negative view of the consequences of the car centred society was continuing. Besides the spatial effects and noise, the air pollution problems were also increasingly coming to the fore. In the morning of the 8th of March 1979, an organised group of demonstrators blocked roads leading into Stockholm. More than 100,000 cars were stopped by the demonstrators, who under the banner “children or cars”, wanted to call attention to the effects of led pollution caused by exhaust fumes.[60]

One can thus discern a quite noticeable shift in ideology, from a general planning optimism and a positive outlook on the effects of the car centred society during the 1950s, to a decidedly more negative view of planning and the consequences of motoring during the 1970s. The importance of this shift in ideology as far as infrastructure investments go is hard to assess, but perhaps it is a part of the explanation as to why investments in transport infrastructure were relatively low during the 70s. Another factor that played a part was the continued recession, brought about by the energy crisis and the increasing global competition. The latter was forcing formerly important industries (such as the shipbuilding industry) out of business, thereby lowering the industries needs for transportation. Lastly the political radicalisation of the 70s gave birth to a movement that has been called the green wave. The

[59] Tengström (1990: p. 39)
[60] Ibid: p. 39 - 41

major urban centres did actually experience dwindling population during the decade, when people moved to the countryside in order to avoid the negative aspects (noise, congestion and pollution) of city life. This came as quite a surprise for city planners since all forecasts had predicted a steady population increase.[61]

All these factors worked together to somewhat ease the pressure on the transportation systems of the major cities, at least temporarily. It is however important to keep in mind that on an aggregate level the tendency toward a more negative view of the consequences of the car centred society did not stop the increase of motoring as well as a continued extension of car related infrastructure (see table 1). But environmental concern and citizen influence issues, often intricately connected, have definitely had a big impact on the planning regime of subsequent decades in several ways. The most notable example of this influence was the passing of new legislation regarding environmental assessments and citizen influence in connection with development.

In 1987 a new planning and building act and a law regulating the use of natural resources was passed. Simultaneously a revision of the planning system resulted in a decentralisation of power since the responsibility for the general planning process was shifted from regional to municipality level. In 1994 in preparation for the Swedish accession to the EU, demands of environmental impact assessments (EIA) were introduced in the detailed planning process (EIAs had been in use in the planning process for roads since the 1980s, but the EU accession implied a more formalised introduction in the general planning process, see appendix 3 for more details). By 1999 the Swedish environmental code was implemented which further strengthened the legal protection of the environment. The combination of these legislative and administrative changes meant not only that quite effective tools for regulating the use of land and natural resources were created, but also that a possibility for more decentralised and perhaps more transparent decision processes arose.[62]

The environmental issues have thus increasingly become regulated by legislation while simultaneously attempts at formalising the channels for citizen influence have been made. The controversy regarding the underlying assumptions and the way cost and benefit are defined in analyses is however still ongoing. In 1979 the parliament decided that cost-benefit analyses regarding investments in infrastructure must consider all costs and benefits to the society as a whole. But although this means that assessments of environmental impacts now are being included, critics still argue that environmental issues are poorly reflected in the cost estimates. It is also interesting to notice that despite the enhanced legislative regulation of environmental aspects, more sophisticated methods for calculating cost-benefit analysis and formalised channels for citizen influence, the plans for several large scale infrastructure projects have been implemented regardless if the opposition was aired out of socioeconomic, environmental and/or local concerns.[63] The "southern link" of the ring road around Stockholm was for instance built regardless concerns voiced on all three grounds, perhaps most notably in spite of several independent analyses in the appraisal process which implied negative returns of the project.[64] The analyses were however disregarded. Another controversy regarding the same project concerned an Environmental Impact Assessment performed by a consultant on behalf of the National road administration that was stopped since it was to critical.[65]

[61] Nyström (2003: p. 132)
[62] Nilsson (2001: p. 21 – 29)
[63] Falkemark (1999) and Blomquist & Jacobsson (2002)
[64] Jansson (2002)
[65] Isaksson (2001: p. 120)

4. The 1980s and onwards: safety, regional visions and planning infrastructure for growth

The economic situation of the 1980s and 1990s was quite volatile, from the stagnation of the early 80s, to the boom time of the late 80s, to a deep recession with a massive increase in unemployment and a financial crisis in the early 1990s. Large budget deficits during the 1980s resulted in substantial cuts in the public sector and a general tendency towards privatisations, which implied a great challenge to the Swedish welfare model. Increasing globalisation, the end of the cold war and the accession to the EU (in 1995) were also very important events during these decades.

The political situation was also far more dynamic than the previous decades. When the social democratic party lost the elections in 1976 it had been in power for almost 40 years. And although the social democrats have been in a government position during most of the last thirty year period (1982 - 1991 and 1994 - 2006 respectively), the era of total political domination was at an end. When in power the social democrats have been increasingly reliant on the support of the green and the left party. A coalition of middle, conservative and liberal parties has formed a government on four separate occasions, last time after the elections in 2006.

In 1988 the parliament decided on a new traffic policy, the central elements of this policy was safety, efficiency and the environment. During the 1990s the focus on safety kept increasing and in 1997, after a parliament decision the National road administration launched "vision zero", a long term vision aiming to reducing the number of fatal and critically impairing accidents to zero. This vision entails new ways of looking at traffic safety and for managing and developing the transport system. The emphasis is to design a road transport system that guarantees the users a minimal risk of suffering fatal or seriously impairing injuries from accidents. In the rhetoric of "vision zero" this means that the responsibility for accidents should be shifted from the individual road user to the "system designers" which includes road managers, politicians, the automotive industry, the police, planners and legislative bodies. The means of achieving this vision is a mixture of different measures including for instance seat belt enforcement, improving road lightning, pedestrian tunnels, ignition interlocks, a bicycle helmet law, median rail guards and speed limit surveillance systems. Clearly the figure zero of "vision zero" is a utopian vision but a concrete goal has been set to decrease the number of deaths caused by road accidents from the 1996 level of around 500 persons/year to around 270 persons/year. In 2007 the figure was only slightly below 500 persons/year so the results are so far quite poor.[66]

Regarding infrastructure the perhaps most directly visible implication of this vision has been large investments in modifying accident prone two lane road sections into so called 2+1 roads. The 2+1 road uses a median barrier two separate the traffic, thereby decreasing the risk for head on collisions. Overtaking is only possible on certain stretches where an additional lane has been built. Arguably another consequence of the increased focus on safety for infrastructure investments could be that road projects presented as safety enhancing have a better chance at getting approved in the early stages of project selection.

The railway has also increasingly been seen as an answer to meet the goals of the traffic policy. It is perceived as a safe and effective means of providing increasing regional interaction in an environmentally friendly way and since the 1990s the investments in railway infrastructure has increased. It can be argued that this heralded a new dawn for the railway. In

[66] National road administration (2006) & (2008)

2001 the social democratic government, the green party and the left party agreed to a ten year plan for infrastructure investments that encompassed 100 billion SEK worth of railway investments. For the first time in modern history this meant that more money was allocated for railways rather than roads (road investments added up to 69 billion SEK for the same period).[67]

It is also possible to discern another important tendency since the 1980s. Firstly, after being a long forgotten argument, the growth promoting effects of transport infrastructure were once again being emphasised in public and political debate. The resurrected belief in the economically benign effects of infrastructure investments can at least partially be traced to two reports published in the early 1990s. One was published by the Swedish Road Federation, a lobby organisation with strong ties to the industrial and political elite in the European Roundtable of Industrialists (ERI). The ERI had since the middle of 1980s been lobbying for heavy investments in the European transport network (which amongst other things included ScanLink, a proposal for improving the transport infrastructure between northern Germany and Scandinavia, for instance by building a fixed link between Sweden and Denmark). The other report was written by a consultant engaged for a special inquiry for the "Productivity delegation" - a state appointed delegation consisting of politicians, economists and business representatives in charge of examining the reasons behind the low economic growth rate. The results of these reports can be summarised as a recommendation to invest heavily in infrastructure since this inevitably would entail economic growth. The basis of this recommendation presented in the two reports has since received serious criticism from numerous experts agreeing that the conclusions in the reports were ungrounded. But none the less, infrastructure investments were embraced as a miracle medicine that would cure the ailing Swedish economy, and it has since been a very influential element in the political debate. As a consequence the budget grants for infrastructure investments grew considerably during the 1990s.[68] Regional development and labour market enhancement are key goals of the transport policy and investments in infrastructure and MUTPs are viewed as very important instruments for achieving this goal. [69]

4.1 Traditional and alternative ways of financing

Another notable trend during the 1990s has been an increasing political interest for finding new ways of financing infrastructure. The reason for this was simply that it was deemed necessary given the proportions of the investments needed, especially in light of the strained financial situation in the early 1990s. Traditionally infrastructure investments in Sweden have been financed by the state. This is regulated by a paragraph in the budgetary law stating that infrastructure investments should be paid for by budget grants. This means that the investments are paid for right away using state revenue. There is however also a paragraph in the law that allows for the parliament to decide on exceptions, which has been the case several times since the 1990s. The reason for the increasing willingness to finding alternative ways of financing was a growing awareness in the late 1980s that the supply of state financed infrastructure was inadequate for meeting the demand in the near future, and given the importance attributed to the building of infrastructure in the visions of regional development it was deemed necessary to try new alternatives. The alternatives that have been tried are: loans from the National Debt Office (Riksgäldskontoret), state guaranteed loans, advancement from

[67] Swedenborg (2002: p. 11) Prices not adjusted.
[68] Falkemark (2006), Ahlstrand (1998)
[69] It is interesting to notice that the strong belief in the benign economic effects of MUTPs remains strong despite evidence that this is rarely the case, presented for instance by Flyvbjerg et al (2006).

municipalities or private interests, financing by fee-charging and public-private-partnerships. In some cases a combination of alternatives has been used for one project.[70]

The introduction of alternative ways of financing has resulted in the existence of two parallel systems for infrastructure planning. The regular planning process produces ten year plans (revised every four years) for investments financed via the state budget. In the period 1998 – 2007 these plans encompassed 190 billion SEK (roughly equivalent of 23 billion € in 2006). But outside this process investments for 50 billion SEK (equivalent of 6 billion € in 2006) were planned which were not included in the state budget since they would be financed in alternative ways. Many MUTPs, such as for instance the Öresund-link and the Arlanda air-rail link are falling under the latter category.[71]

The most common form for alternative financing is by lending money from the National Debt office, and this financing form has been increasing substantially during the last decade. But lately it has been acknowledged that loan financing is associated with problems. A general problem concerns the parliament's diminishing influence over the planning process, which could imply decreasing potential to control the development of the overall transport system. Moreover, financial costs for the loans will burden the normal grants for the national road and rail administrations. In the last decade the share of the annual grants devoted to mortgage payments for loan financed projects have increased rapidly for both administrations. This means that the actual budget grants are hollowed out, causing increasing problems with dealing with costs for maintenance and upkeep for the existing infrastructure as well as delaying new projects due to lack of funds.[72]

4.1.1 The Öresund link

The building of the Örsund link was the first time alternative ways of financing was used for a major transportation project, and the signing of the agreement between the Danish and Swedish governments in 1991 thus marks a clear shift in the political attitude towards financing infrastructure projects. It was clearly stated that the cost for building the link should not burden the state budget and thus the loophole in the budgetary law was used for the first time.[73]

The finished link, which opened for traffic in the year 2000, consists of 16 kilometres of four lane motorway and double tracked railway. Even though it is usually referred to as a bridge, it actually comprises three main elements; a bridge (6 km), a superficially made island (4 km) and a tunnel (4km). The central idea was financing by charging a users fee. A state owned corporation, owned by the Swedish and Danish states was formed, and in turn they formed the Öresund bridge consortium in 1992. This consortium was responsible for finding financial backing, which was found in the private bank sector. The Swedish and Danish states were acting as guarantors through the consortium. The total cost for completing the project has been estimated to some 38, 6 billion SEK (more than 4, 15 billion €) including the land use interfaces for rail and road traffic on both sides. Cost overruns for the actual link is estimated to 26 %, while connecting infrastructure on the Danish side were 68 % higher than the estimates and 16 % higher on the Swedish side.[74] The loans are to be repaid with the revenues from car and train traffic and with present traffic volumes (and other factors such as

[70] Riksdagens Revisorer (2000: p. 13)
[71] Riksdagens Revisorer (2000: p. 14 & 20)
[72] Riksdagens Revisorer (2000): p. 20 – 25 & Swedish government (2008)
[73] Swedish government (1991)
[74] Flyvbjerg et al. (2006: p. 13)

interest rates and economic growth pace) the consortium is expecting the loans to be repaid sometime between 2027 and 2041.[75]

4.1.2 The Arlanda link

The air-rail link between Stockholm and Arlanda opened for traffic in 1999. It is a double tracked railway that connects Arlanda airport with the railway between Stockholm and Uppsala. There are three underground stations at the airport, two of which serves the express trains to and from central Stockholm, and one which serves long-distance, regional and commuter trains. It was the first Swedish infrastructure project to be co-financed by the state and private interests in a Build-Operate-Transfer (BOT) model. In the planning stage a joint company was formed by the national rail administration (banverket) and the national air administration (luftfartsverket). This company called A-Banan Project Inc. administrated land admissions and obligations regarding the timeframe and quality of the project. It also served as the counterpart to A-Train Inc. a consortium formed by the private actors (NCC, Vattenfall, GEC Alstom and John Mowlem & Company PLC).

The total cost of the project was some 4, 9 billion SEK (more than 520 million €). The shareholders of the private consortium invested 650 million SEK (70 million €), the state invested 930 million SEK (100 million €). The rest of the cost was financed by loans, of which some 2 billion Sek (215 million €) were granted by private banks and 1 billion SEK (108 million €) were granted by the national debt office.[76] The private consortium was responsible for the construction phase; once the railway was completed the ownership was transferred to the state under management of A-Banan Project Inc. The state then leases the track back to the private consortium who has been awarded the right to run the traffic until the year 2040. The state and the private consortium split the revenues from the traffic.

5. Contemporary issues

5.1 Sustainability challenges and contradictions

Sustainability and a sustainable development were made official policies by the Swedish government in 1997, when the reigning social democratic party declared its visions of “the green welfare state” (det gröna folkhemmet). This vision implied ecological modernisation that by way of innovations, technology and resource efficiency would create jobs, growth and welfare in a sustainable manner as well as turn Sweden into a model state for sustainable development. The overall goals of Swedish transport policy are since a parliament decision in 1998 established as socioeconomic efficiency and sustainability. These goals are further divided into partial goals where the development regarding parameters such as accessibility, transport quality, traffic safety, environment, regional enhancement and gender equality of the transport system is continuously monitored.[77] A more integrated view of the transport system is also manifest in present attempts at combining the planning of one of the regional divisions of the national road- and rail administrations.[78]

[75] Öresundsbro konsortiet (2007: p. 19 - 22) values are adjusted for inflation and the exchange rate between Sek and € is calculated at 9, 30 Sek/€.
[76] Riksdagens revisorer (2000: p. 40) All prices are adjusted for inflation, the sums in Euros are calculated at an exchange rate of 9, 3 Sek/€.
[77] Sika (2002)
[78] Based on information from an official at the National Road Administration.

Even though the notion of sustainability is embraced by the highest authority the implications for the planning and delivery of MUTPs is hard to pin point. What can be said with certainty is that there has been a steady increase in goods and passenger traffic by train during the last years. The levels today are the highest ever and the increasing demand has also lead to increasing strain on the infrastructure and there are now severe capacity problems in many parts of the country.[79]

Despite the increasing demand for rail transport, road traffic is still by far the most dominating mode of transport. Thereby CO_2 emissions pose a serious challenge to the goals of the Swedish climate policy which include reducing emissions from the transport sector to the level of 1990 by the year 2020. Climate change challenges and the role of transport and transport infrastructure is currently a common topic in the national news media, and the present government that has been in power since the elections in 2006 seems to have taken a strong interest in the issues (at least on a rhetorical level). However, in September 2008 the government presented a programme including 10 billion SEK extra for infrastructure development over the next two years (in addition to the 14 billion SEK already allocated to infrastructure during the period). The additional funds will be used to remedy some big problems in the transport infrastructure, mainly in the metropolitan regions, in order to improve the situation for commuters and transport dependent businesses.[80] Three quarters of the funds are directed towards investments in road projects and the remaining quarter to rail projects. So regarding the role of infrastructure in meeting the future challenges for CO_2 emission reductions there seem to be a gap between the rhetoric and the "real politik" at present. A new infrastructure proposition setting the economic framework for the period 2010 – 2020 is due during fall 2008 and this will be a very important indicator of the direction regarding infrastructure development in the near future.

On a more speculative note, the impression I get from following the recent debate in news media is that the government in no way seems to be interested in any kind of political course of action that will put restrictions on travel or transportation. On the contrary, the increasing transportation of goods and people is viewed as an unavoidable consequence of the globalisation process, and there seems to be a very high confidence in that the negative effects of transportation can be remedied by technical fixes. Thus, in my opinion it seems obvious that MUTPs, especially projects favouring collective solutions, will be an important part of the transportation strategy of the near future *if* the ambitions to curb CO_2 emissions from the transport sector are serious (the big investment package in road projects over the next two years could however suggest otherwise). The overarching goal of sustainable development, as well as several of the partial goals of the current transport policy also seems to strengthen this interpretation. It also seems obvious that the planning, appraisal and implementation of new MUTPs will be increasingly complex considering the many, sometimes conflicting or contradictory goals of the transport policy. How will the different goals be weighted in the decision processes for new infrastructure investments? Are for instance the overarching goals of socioeconomic efficiency and sustainability actually possible to combine when it boils down to matters of design, shape, function and siting of MUTPs in practice? Although the merits of cost-benefit analysis, and the parameters used in these kinds of analysis, have been contested for decades the method is still a central part of any project appraisal and the decision process regarding how to best utilise economic resources. In light of the nature of many of the goals in the transport policy, the shortcomings of cost-benefit analysis is likely to become more accentuated, but regardless of the awareness of this issue the problem with finding rigid alternative or complementary methods for project appraisal still remains

[79] Sika (2008)
[80] Swedish government (2008)

unsolved. The inadequacy of cost-benefit for handling environmental impacts, human lives or any other factors affecting the welfare of society is a pressing matter made all the more acute since the current transport policy emphasises the importance of these kind of values.

6. References

6.1 Literature

Ahlstrand I (1998) *Beslutsprocess och beslutsunderlag vid trafikinvesteringar – med exempel från Dennispaketet, Öresundsbron och Karlstads nya flygplats.* Forksningsrapport, KTH

Anell et al. (1971) *Ska vi asfaltera Sverige?* Pan/Nordstedts, Stockholm

Alfredsson & Wiman (1997) "Planning in Sweden" in *Swedish Planning: towards sustainable development* (1997) PLAN, Westlund & Söner, Gävle

Binde P (2000a) "The Swedish railroads: a brief historical background" in *National objectives Local objections Railroad modernization in Sweden* edited by Boholm Å (2000) CEFOS, Göteborg

Binde P (2000b) The legal framework for railway construction in *National objectives Local objections Railroad modernization in Sweden* edited by Boholm Å (2000) CEFOS, Göteborg

Blomkvist P (2001) *Den goda vägens vänner Väg- och billobbyn och framväxten av det svenska bilsamhället 1914 – 1959.* Symposium, Stocholm/Stehag

Blomquist C & Jacobsson K (2002) *Drömmar om framtiden: beslut kring infrastruktur* Studentlitteratur, Lund

Castensson R (1991) "Stommen i Sveriges infrastruktur" in *Vägar: Dåtid Nutid Framtid* (1991) Bertil Heddelin Vägverket, Borlänge

Dufwa A (1986) *Trafik, broar, tunnelbanor, gator* Liber, Stockholm

Falkemark G (1999) *Politik, lobbyism och manipulation: svensk trafikpolitik i verkligheten* Nya Doxa, Nora

Falkemark G (2006) *Politik, mobilitet och miljö: om den historiska framväxten av ett ohållbart transportsystem* Gidlund, Möklinta

Flyvbjerg et al (2006) *Megaprojects and risk: an anatomy of ambition* University press, Cambridge

Gullberg A (1990) "Bilen som första stadsmakt" in *Miljö, media, makt* (1990) Svante Beckman, Carlsson bokförlag, Stockholm

Hall P (2002) *Cities of tomorrow* 3rd edition, Blackwell publishing

Hedegaard Sörensen C (1993) *Slår bro fra kyst til kyst? En analyse av Socialdemokratin och Öresundsförbindelsen*, Hovedland

Hölcke O (1986) "Järnvägstrafikens anpassning till bilsamhället" in *Bebyggelsehistorisk Tidskrift* nr 12 1986

Isaksson K (2001) *Framtidens trafiksystem? : maktutövningen i konflikterna om rummet och miljön i Dennispaketets vägfrågor.* Tema, Linköping

Jansson J O (2002) ”Trafikpolitik för Stockholm” in *Skattemiljarder i trafikpolitiken – till vilken nytta?* (2002) Swedenborg B, SNS förlag, Stockholm

Kaijser A (1994) *I fädrens spår…* Carlsson Bokförlag, Stockholm

Modig H (1991) ”Transporternas historia i växelspel” in *Vägar: Dåtid Nutid Framtid* (1991) Bertil Heddelin Vägverket, Borlänge

National road administration (2006) *Safe traffic Vision zero on the move.* Vägverket, Borlänge

National road administration (2008) *Analys av trafiksäkerhetsutvecklingen* 1997 – 2007. Vägverket, Borlänge

Nilsson K (2001) *Planering för hållbar utveckling: Dilemman för kommunala översiktsplanerare.* Forskningsrapport KTH

Nilsson J-E (2002) Infrastrukturplanering – en process i behov a institutionella reformer in *Skattemiljarder i trafikpolitiken – till vilken nytta?* (2002) Swedenborg B, SNS förlag, Stockholm

Nyström J (2003) *Planeringens grunder: en översikt.* Studentlitteratur, Lund

RRV (1994) *Infrastrukturinvesteringar – en kostnadsjämförelse mellan plan och utfall i 15 större projekt inom Vägverket och Banverket.* Riksrevisionsverket, avdelningen för effektivitetsrevision

Riksdagen revisorer (2000) Förslag till riksdagen 2000/01: RR11 *Riksdagen revisorers förslag angående nya vägar till vägar och järnvägar.*

Sandström T & Ehrman C (1966) *Essingeleden* Gatukontoret, Stockholm

Sika (2002) *Samhällsekonomiska analyser i kombination med transportpolitiska mål*

Skårfors R (1999) *Beslutsfattandets dilemma: Planarbete och opinionsyttringar rörande trafikleder i Stockholm 1945 – 1975.* Uppsala universitetspress, Umeå

Swedenborg B (2002) ”Att granska trafikpolitiken – inledning, sammanfattning och slutsatser” in *Skattemiljarder i trafikpolitiken – till vilken nytta?* (2002) Swedenborg B, SNS förlag, Stockholm

Swedish Government (1991) Prop. 1990/91: 158 *med anledning av ett avtal mellan Sverige och Danmark om en fast förbindelse över Öresund*

Swedish Government (2004) *Kommuner och landsting – organisation, verksamhet och ekonomi*

Swedish Government (2008) *10 miljarder till vägar och järnvägar i hela landet*, promemoria 20080911

Tengström E (1990) ”Bilsamhället: Bilens makt och makten över bilismen” in *Miljö, media, makt* (1990) Svante Beckman, Carlsson bokförlag, Stockholm

Turesson B (1991) ”Pionjärernas drivande kraft” in *Vägar: Dåtid Nutid Framtid* (1991) Bertil Heddelin Vägverket, Borlänge

Vägplan för Sverige (1958) SOU 1958: 1

Westlund H (1996) *Infrastruktur i Sverige under 1000 år.* Forskningsrapport, KTH

Öresundsbro konsortiet (2007) *Värt att veta om Öresundsbron*

6.2 Internet references

Sika (2008) *Järnvägens person- och godstransporter fortsätter att öka,* available at: http://www.sika-institute.se/templates/Newsletter____1456.aspx

Statistics Sweden (2008a) ”Registrerade personbilar och lastbilar i trafik 1923–2005” available at:
http://www.scb.se/Grupp/Omscb/SÅ2007/Transporter.xls#'244'!A1 accessed 080409

Statistics Sweden (2008b) ”Samtliga järnvägar, bana och godsvagnar”
Available at:
http://www.scb.se/Grupp/Omscb/SÅ2007/Transporter.xls#'247'!A1 accessed 080409

Appendix 1. The Swedish planning system

The state	County councils (20 units)	The municipalities (290 units)
National level The Parliament The Government Cabinett office and the ministries State authorities and institutions (for instance the National road- and rail administrations)		
Regional level County administrative board	**Regional level** County council assembly County council board Administration and operations	
Local level	**Local level** Local administration and operations	**Local level** Municipal assembly Municipal board Administration and operations

Table 2 Swedish administration[81]

The Swedish administration is divided into three levels: state, county council and municipal level. The state sets the frame and goals but there is no strict hierarchal relation between the different levels since they all have their own self-governing authorities and in essence are responsible for different activities.

A main characteristic of the Swedish planning system is the municipal planning monopoly, which is based on self-governing municipalities with the right to impose direct taxes on the citizens. The system with municipalities has been revised several times from the 1950s and onwards and the general tendency has been towards larger administrative units; while almost 2,500 municipalities existed in 1950, today there are 290.[82] The municipal planning monopoly means that the municipal council is responsible for establishing adopting both the non-legally binding comprehensive plan as well as the legally binding detailed plan. This entails that the municipal level has far reaching power regarding planning matters, but given the nature of transport infrastructure investments the regional and national administrative levels are in reality also influential actors. The regional level (20 units consisting of 18 counties and two regions) are via the county administrative board responsible for making sure that the municipalities are following the established planning procedure which is regulated by formal legislation (see table 2) established by the parliament. The county administrative board is also directly responsible to the government and is thus coordinating national and regional interests. The role of the central government is formally limited to reviewing certain issues, for instance environmental impacts, but given their ultimate responsibility for financing transport infrastructure, they are of course also very powerful actors.[83]

[81] Swedish government (2004)
[82] Swedish government (2004)
[83] Alfredsson & Wiman (1997)

Broad category	Name	Administrative level	Legal status
Planning legislation	The planning and building act (PBL)	National	Compulsory
special act	The environmental code	National	Compulsory
special act	Railways act	National	Compulsory
special act	Roads act	National	Compulsory
Advisory comprehensive plan	Regional plan	Regional/county	Not legally binding
Advisory comprehensive plan	Comprehensive plan	Municipal	Not legally binding but required
Advisory comprehensive plan	Detailed comprehensive plan	Municipal	Not legally binding but required
Implementation plan	Special area regulations	Municipal	Legally binding when adopted by municipal council
Implementation plan	Detailed development plan	Municipal	Legally binding when adopted by municipal council
Implementation plan	Building permit	Municipal	Legally binding when adopted by municipal council

Table 3 The main elements of the Swedish planning system[84]

[84] Based on Alfredsson & Wiman (1997)

Appendix 2. Economic appraisal procedures for infrastructure investments

The overarching framework for infrastructure investments is set in the government proposition for infrastructure investments which has to be accepted by the parliament. This political process is referred to as "direction planning", since it stakes out the desired direction of the transport policy. It also establishes the economic limits for investments in the road and railway network (often over a ten year period) and thus governs the continued planning process in the national road and railway administrations. The national road and rail administrations are then expected to come up with "measure plans", which proposes suitable measures in order to improve the national transport network.[85]

The political directives for the "measure plans" states that the prioritisation of proposed projects should be made by using benefit-cost ratio together with an assessment of the overall impact on the goals of the transport policy. It should however be noted that many of the Swedish MUTPs have been built despite showing negative benefit-cost ratio from the earliest stages of the economic appraisal procedure. The rules set by the parliament are thus often side stepped but in theory the economic appraisal procedure roughly follows the subsequent steps:

- Origin of the project: The need for a certain infrastructure project is usually identified by the regional divisions of the national road and rail administrations (the proposal for the project can however also come from a municipality, a county or representatives for industries etc). A primitive analysis based on a straightforward model of costs and benefits of the project is used in this stage. Usually the cost estimates are based on experience of the responsible analysts and regional conditions.
- Prioritisation: If the project is deemed profitable by the regional division it will then be compared to other projects in the long term national plans, where the individual order between projects is decided. The long term national plans are revised every three years and there can be major differences between the basis for cost estimates between new projects and ones that have been incorporated in the plans for several years. The individual order between projects can be affected by cost escalations of other projects and other factors, for instance employment shortage. Since the 1990s there has been an emphasis on corridors rather than individual projects, which also affects the order of prioritisation.
- Planning phase: Successive investigations regarding alignment, technological specifications, traffic volumes and environmental impacts. External stakeholders such as municipalities, counties, environmental institutions and NGOs are contacted in this stage and more detailed cost estimates are made. If necessary an update of the benefit-cost ratio is made, which can result in a change in the order of prioritisation in the long term national plans.
- Detailed projecting: Once the detailed projecting and purchasing of entrepreneurial services is finished the final cost analysis is made[86]

[85] Nilsson (2002)
[86] RRV (1994)

Appendix 3. Environmental appraisal procedures for infrastructure projects

Like all other EU member states, the Swedish environmental appraisal procedure is governed by the EU directives regulating EIA's (85/337/EEG & 2001/42/EEG). These directives states that the main purpose of EIA's is to contribute to a sustainable development, but exactly how this goal is to be achieved or what the goal actually entails is however not further specified.[87] In Sweden the possibility of introducing sustainable impact assessments (SIA's) for the overarching national sustainability strategy are under discussion, but as of yet nothing concrete affecting the planning of infrastructure has come out of these discussions. Instead the EIA has been the main environmental appraisal procedure for infrastructure projects in the Swedish system since the introduction in the 1980s and the EU directives have been implemented through legislation and special acts in the planning system (see table 3).

The introduction of EIA's in Sweden preceded the accession to the EU which is reflected in some characteristics of the system. It is for instance possible to distinguish between at least four different types of EIA's relevant to the planning of transport infrastructure and typically the planning and decision making context of a MUTP would relate to more than one of these categories.

- EIA for activities or measures that acquires permission from the authorities.
- EIA for activities or measures affecting areas classed as Natura 2000 according to the EU Habitats and Birds directives.
- Environmental assessment of plans and programmes made by authorities (i.e the plans made by municipalities).
- Environmental assessment of overarching, strategic plans and decisions made by the parliament, the government and central authorities. (During the 1990s the strategic plans of the national road and railway administrations were for instance subjected to EIA's)

Some further characteristics of the Swedish EIA procedure can also be identified:

- The EIA is closely connected to the permission granting process.
- An EIA is acquired for almost any activity or measure requiring permission from the authorities.
- The developer is responsible for providing the EIA.
- Dialog is the main mechanism for quality assurance.
- The EIA is used as a decision making base.[88]

The occurrence of many different types of environmental assessments, all referred to as EIA's entails that it is a very common procedure in the Swedish planning system; more than 2,000 are made annually. There is however often a big difference between the form and substance of different projects depending on an initial assessment of the overall environmental impact of the planned activity or measure.

[87] Hedlund & Kjellander (2007)
[88] Ibid.

EIA's are mandatory for all types of transport infrastructure projects. A typical environmental appraisal process of a road or railway project can be viewed as a process consisting of three phases:

- In the *pre-study phase* an investigation area and/or different road or railway alternatives are established. In this phase an overview of the environmental status based on existing information is made. The conditions for project implementation regarding traffic volumes, technology and economy are studied in an overarching manner. Problems, suitable measures and effects of these are then described. Based on these findings of the process might move on to the next stage (or be terminated if the findings suggest that this is the best option).
- In the *road (or railway) investigation phase* the different alternatives are defined and specified in order to decide which alignment to choose. The result of this phase should be a recommendation of technical standard and choice of corridor. Here an EIA is to be made which has to be approved by the county administrative board (see table 2).
- In the *work plan (or railway plan) phase* the shape of the project is further specified within the chosen corridor, often providing different alternatives. Here the amount of land needed and how to implement the project is specified. Another EIA is needed for this stage, which also has to be approved by the county administrative board; additionally a dialog with the concerned municipalities is required.

The same infrastructure project might thus require more than one EIA. In practice it might actually be the case that what is treated as a single project in the road (or railway) investigation phase is split up into several smaller work plans, each requiring a separate EIA. What triggers the need for an EIA is therefore depending on whether the measures imply a need to perform investigations in the latter two phases of the process. This means that the size of the project is not the defining factor, small and large projects are treated in the same manner. However the matter of carrying out the EIA is of course hugely different depending on the size of the project and for larger projects it is common for the road and railway administrations to create semi-independent organisations in charge of the project where the EIA is carried out by consultants or a consortium of consultants.

The connection between the two latter stages of the project procedure also means that considerable modifications, such as upgrading the road or track capacity (more lanes or tracks) can be made without a new EIA if it is kept within the planned area that was originally approved by the county administrative board. [89]

[89] Hedlund & Kjellander (2007)