

**Memorandum**

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**Swedish Governmental Official Reports  
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**A Strategy for Reduced Transport  
Dependency**

**Swedish Environmental Advisory Council  
Memorandum 2006:2**

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To Lena Sommestad, Minister for the Environment and Chair of Swedish Environmental Advisory Council and to Mona Sahlin, Minister for Sustainable Development.

The Environmental Advisory Council advises the Swedish Government on environment issues. During the present mandate period, the Council aims to contribute to the strategic discussion about how in the long term we will meet the Swedish environmental quality objectives and our international obligations, and also to provide the Government with day-to-day advice on current environmental policy issues. The strategic discussions take place within two clusters:

1. Environmental policy for ecological transition, which deals with how we are to decouple economic growth from environmental destruction.
2. Environmental policy for the sustainable exploitation and management of our natural resources.

The Council's cluster group for ecological transition has analysed the scope for reducing transport dependency. It has chosen in particular to illuminate the extent to which present policy instruments need to be reformed in order to underpin such a development in society. The group consists of the Vice-Chairman of the Council, Jan Bergqvist; the Secretary-General, Svante Axelsson; Professor Christian Azar; Åsa Domeij MP; Professor Thomas B. Johansson; Anna Jonsson, Political Secretary; Associate Professor Annica Kronsell; Professor Anna-Lisa Lindén; District Superintendent Johan Trouvé; Director-General Ines Uusmann and Professor Barbara Wohlfarth.

The Council wishes particularly to highlight changes that are strategic. In this memorandum attention is therefore drawn to policy instruments for physical planning and financial policy instruments which can produce long-term effects on the scope for reducing transport dependency. The purpose is to create a

sustainable demand for transport and to achieve greater impact and higher cost efficiency in climate policy.

The following researchers and practitioners have helped prepare the memorandum: Stefan Andersson, Ministry of Industry and Trade; Päivi Elmkvist, Lund Municipality; Dan Firth, London Transport; Sven Hunhammar, Swedish Environmental Protection Agency; Gustaf Landahl, City of Stockholm; Rolf Lindell, Ministry of Sustainable Development; Christer Ljungberg, Trivector Traffic AB; Lars Nilsson, Swedish Road Administration; Anders Roth, City of Gothenburg; Titti de Verdier, City of Stockholm/Inregia and Jonas Åkerman, Research Group on Strategic Environmental Studies. The memorandum has been the subject of discussion during seminars with the above-mentioned reference people.

Views and tips have also been received from: Kjell Avergren, Swedish Road Administration; Järda Blix, National Board of Housing, Building and Planning; Jens Forsmark, Swedish Society for Nature Conservation; Terry Hartig, Institute for Housing and Urban Research; Kerstin Hugne, National Board of Housing, Building and Planning; Jan Hultgren, City of Stockholm; Elin Kronqvist, Ministry of Sustainable Development; Anki Ingelström, Swedish Rail Administration; Peter Ljungqvist, Ministry of Finance; Per Magdalinski, Swedish Environmental Protection Agency; Lars-Göran Mattsson, Royal Institute of Technology; Magnus Nilsson, Swedish Society for Nature Conservation; Mats Rosenlund, Stockholm County Council; Olov Schultz, National Board of Housing, Building and Planning and Per Schillander, Swedish Road Administration.

#Those from the Council's secretariat taking part include Lina Bergström, Eivor Hagman, Kristina Olsson and Siv Näslund.

The Council board, under the chairmanship of Jan Bergqvist, has resolved to submit this memorandum and its proposals for measures to bring about reduced transport dependency to Lena Sommestad (Minister for the Environment and Chair of Swedish Environmental Advisory Council) and to Mona Sahlin (Minister for Sustainable Development).

Stockholm, April 2006.

Jan Bergqvist  
Vice Chairperson

# Contents

(Note that only selected chapters are translated)

## *Summary*

### *1. Introduction*

Transport – the great climate challenge

An investment area in the road transport sector climate strategy

Purpose and delimitation

Disposition

### *2. Greenhouse gas emissions and trends in transport and building development*

Greenhouse gas emissions

Transport

    Passenger transport

    Goods transport

Building development

    Regional enlargement

    Urban sprawl

    Out-of-town retail outlets

### *3. Planning of infrastructure and building development which results in increased distances*

Does the national policy give priority to accessibility or availability?

    This is how we built a transport society

    The car in advertising

    Heavy-weight stakeholders

    Targets in different policy sectors not harmonised

Accessibility standards dominate infrastructure and transport policy

    Investments focused on road capacity

    Socioeconomic calculations which shed insufficient light on climate and environmental effects

    Traffic plans without analysis of land use effects

Building development planning which increases distances in daily life

    The lack of regionally coordinated transport planning

    Weak comprehensive plan

    The Planning and Building Act contains no requirements for sustainable municipal transport planning

- Detailed planning regulations lack precise environmental requirements
- Out-of-town trade outlets are not subject to inquiry in accordance with the Environmental Code
- Implementation contracts stipulate no requirements as regards transport
- Minimum standards for parking
- Lack of research

#### *4. Economic policy instruments which result in ineffective transport solutions*

Using the car – the smart choice

- Fuel taxation which does not cover the costs of the traffic
- No tightening for increased scope for consumption
- No sales or registration tax
- Vehicle tax with weak CO<sub>2</sub> differentiation
- Advantageous company car system
- Taxing company car parking benefits has little impact
- Inadequate consumer information and restricted consumer choice for vehicles

Walking, cycling and public transport are complicated

- Shortcomings in development and coordination
- Tax allowances for travel without incentives
- Benefits for cycling, walking and using public transport are taxable

Conditions that increase focus on the car

Laissez-faire policy for goods transport by road

- Abolition of mileage tax results in low prices for freight
- Poor control of the haulage industry depresses prices further
- Complicated Public Procurement Act leads to extensive transport
- Transport in commerce and industry sector is difficult to coordinate
- Good alternatives battling against the odds

Brief arguments about public acceptance of economic policy instruments

*5. Recommendations by the Swedish Environmental Advisory Council*

- A) Focus accessibility and sustainable transport solutions at the national level
- B) Strengthen weak planning tools
- C) Reform ill-directed economic policy instruments

*6. Possible components of an impact assessment*

Security of provision

Climate effects

Environment

Health

Gender equality

Public resources – today and in the future

Employment opportunities and export revenues

Discussion of financing

*Literature and references*

# Summary

*Well-developed communications are a central resource for our welfare.* The overall objective of transport policy is to ensure a socio-economically effective and long-term sustainable provision of transport for the country's citizens and business sector.

*The starting point for the Council's report is economically, socially and ecologically sustainable development.* The purpose of the report is to highlight the scope for decoupling economic growth from transport development and its negative effects.

*The focus is on existing policy instruments and structures that contribute to increased transport dependency and that can be detrimental to the sustainable alternatives.* We present a strategy, the focus of which does not necessarily include precisely the individual specific measures that we discuss in the report. It ought to be possible to achieve the same results with a somewhat different combination of measures. What is important is to create quality of life and to develop present-day society without jeopardising the opportunities of forthcoming generations to satisfy their needs.

*The climate challenge and likely dwindling supplies of oil, currently the most important source of energy on earth, will necessitate major changes in our energy systems.* The majority of observers agree that we must firstly strive for greater efficiency. The most difficult changes will occur in the transport sector. Road transport is responsible for a large proportion of CO<sub>2</sub> emissions. Their extent is increasing rapidly in heavily populated and rapidly growing countries, such as China. Their extent is also large and continually increasing in the Western world.

*It has become increasingly obvious that road transport also has other negative effects* such as:

- *environmental effects* eutrophication, acidification, damage to crops, forests and water quality, and the reduction of biological and recreational landscape features.
- *health effects* related to air pollution, noise, traffic accidents and reduced physical activity. In Sweden air pollution annually causes thousands of premature deaths and approximately 500 lives per year are lost in traffic accidents. Almost one million people suffer in their homes from traffic noise that exceeds national guideline values and weight-related illnesses are on the increase among the population,
- *social effects* for social groups who do not have cars,
- *socioeconomic effects*, including those caused by congestion.

*Today* road transport accounts for almost 30 per cent of Sweden's total CO<sub>2</sub> emissions. In order to achieve the transport sector's climate objectives for 2010, we must reverse a negative trend. Historically, CO<sub>2</sub> emissions in the sector have steadily increased and the forecasts indicate a continued increase of about 2 per cent per year, whereas they really should diminish by 1.4 per cent per year in order to meet the transport sector's interim targets by 2010.

*During the last decade* passenger transport by road has increased by 14 per cent. Moreover, passenger cars in Sweden have the highest fuel consumption in Europe. Almost 50 per cent of travel consists of 'unavoidable' journeys, that is to say work-journeys and those for shopping and other services. Over the same period freight transport by road has increased by a staggering 26 per cent, despite a significant reduction in the volume of goods carried. It is primarily long-distance haulage that has increased.

*By 2020*, passenger transport in Sweden is expected to increase by 35–40 per cent and goods transport by 50 per cent. A large part will take the form of road transport. During the same period, the industrialised countries need to reduce their emissions of greenhouse gases by 15–30 per cent, according to EU Heads of State and Government. *By 2050* it is thought that the industrialised countries will need to reduce these emissions by 60–80 per cent.

*Development in the transport sector has to take place on several fronts* if this challenge is to be met. We must convert to renewable fuels and create more efficient vehicles. The greatest potential in the longer term, according to the Swedish Road Administration's

(SRA's) climate strategy, lies in investment in transport-efficient social structures and demand. The most important means to achieve this are economic policy instruments and physical planning. The Swedish Environmental Advisory Council has therefore chosen to study these areas in particular detail.

The following *overall trends* affect transport development: increased globalisation, more rapid transport, increased economic welfare, higher levels of gainful employment and the changed composition and organisation of the Swedish business sector.

There is a *geographical dimension* in transport development. At the national level the clearest tendency is the expansion of labour-market regions. Over a period of 20 years the number of regional labour markets has diminished from 140 to 87. This development was supported by both central and local government.

Local urban sprawl has also taken place. Between 1980 and 1995 distances in everyday life became longer and the conditions for walking and cycling to shops and services deteriorated in both small and large urban areas. This development can be linked to the rapid establishment of out-of-town shopping centres, which have doubled in the space of 20 years. The rate of expansion is still high. In 2004 one municipality in three was planning to expand out-of-town retail trade.

*We are gradually establishing an inflexible building and transport structure that increases unavoidable journeys.* Regional enlargement and urban sprawl place increased demands on roads, and the construction of new roads leads to further urban sprawl.

Increased distances and the need for transport also have *social dimensions*. Examples include:

- *Children and older people* have less access as a direct effect of increased distances and increased car-dependency, but also as an indirect effect because more and heavier vehicles exacerbate traffic risks.
- *Weak consumer groups* are hit by urban sprawl and the disappearance of local retail outlets and services. The argument advanced in favour of out-of-town trading is that it results in low prices, but it is difficult to reach for consumers who do not have access to a car.
- *Women* compensate for the increased commuting time caused by regional enlargement by reducing their working time or, to a greater extent than men, by taking a job nearer home.

All this points to the importance of the Government, regions and municipalities having planning tools at their disposal that can create more ecologically, as well as socially sustainable building and transport development. It is also important for economic policy instruments to be designed so that they do not send the wrong long-term signals. Tax deductions for travel and other financial incentives subsidise car journeys and are a factor in decisions to live and to locate businesses further out. Transport dependency and CO<sub>2</sub> emissions increase, creating a need to raise taxes that have a steering effect, at a time when opposition to such policies is growing.

## **A strategy for reduced transport dependency**

To create conditions for sustainable transport in Sweden, the Council recommends the Government to adopt a strategy for reduced transport dependency which A) increases the focus on access and on sustainable transport solutions in overall political management, B) strengthens planning tools and C) reforms economic policy instruments. The focus is on reforming policy instruments that currently steer in the wrong direction and which thereby contribute to transport dependency, sending contradictory messages to important societal actors in the climate challenge. The Council proposes the following ten measures to put this strategy into effect.

### **A) Focus on access and sustainable transport solutions at the national level**

A long-term system perspective is required in order to avoid locking ourselves into transport dependency and to realise the potential for reducing impact on the climate where it is at its greatest. The following measures are central to such an approach.

3. *Create a platform for transport-efficient social structures and demand.* Central government can optimise measures, and thereby increase the pace, in this policy by means of overarching policy cooperation.
  - a) *Create a vision for “A transport-efficient Sweden by 2050”.*
  - b) *Make more detailed assessments of potential, adopt time-framed objectives and develop robust strategies in the long, medium and short term.*

- c) *Adopt a national logistics plan for sustainable communications.*
4. *Improve the basis for investment decisions.*
- a) *Develop socioeconomic analysis for comprehensive planning and investment decisions.* Existing socioeconomic calculation methods with regard to investment and planning need to be supplemented by methods which can provide holistic pictures of the consequences of various alternative developments and which make environmentally sound alternatives fairer.
  - b) *Present the land-use effects of modified traffic infrastructures.* Traffic plans and object analysis should therefore analyse secondary land-use effects and the ensuing traffic effects of changes in the traffic system.
  - c) *Present how national transport agency resources are allocated among different types of measures* in accordance with the Swedish Road Administration's (SRA) four-stage principle.
5. *Increase public acceptance of this policy by taking the lead in its implementation.*
- a) *Use public procurement to make transport more environmentally sound and more efficient.* It should be simpler to make environmentally sound and efficient goods transport a requirement of public procurement. Central government should set a good example by procuring transport services in the best quartile on the market and by creating good logistics for its own goods transport.
  - b) *Make the environmentally sound journey the norm in the Government's own activities* by adopting an environmentally sound travel policy, working with logistics for business trips and putting a premium on environmentally sound communications.

## **B) Strengthen weak planning tools**

Municipal planning and regional development have a significant bearing on the scope for reducing 'unavoidable' transport, that is to say transport which, in itself, brings no added value. In addition to reducing the impact on the climate and environment, greater efficiency in such transport can reduce costs and produce qualitative gains for the actors concerned. Measures to bring about

more efficient transport are needed at both the regional and the local level.

6. *Create the conditions for adopting the regional climate challenge.*
  - a) *Create regional coordination.* The task of the Parliamentary Commission on Social Responsibilities, the Government's efforts to produce a national strategy for regional development and a revision of the planning and building legislation should take as their starting-point the need for regional coordination and measures that can prevent the negative effects of regional expansion on the climate, the environment and health.
  - b) *Adopt a methodology for sustainable transport planning.* The Government should require that regional plans for sustainable transport be developed and, as a minimum, require that regional development plans be subjected to impact analysis as regards building and transport effects.
  
7. *Reform planning tools to ensure sustainable local building and transport development.* New planning and building legislation and the current overview of parking legislation should integrate the proposals below.
  - a) *Link national environmental quality objectives more closely with the Swedish Planning and Building Act* so that they become an obligatory component of overall and detailed planning.
  - b) *Place demands on municipal plans for sustainable transport.*
  - c) *Make out-of-town retail trade outlets subject to enquiries in accordance with the Environmental Code* or, as a minimum, provide scope for placing requirements on transport in implementation contracts.
  - d) *Revise parking legislation* so that it signals a more restrictive policy and can be exploited with a view to putting a premium on environmentally sound alternatives.

### **C) Reform ill-directed economic policy instruments**

Economic policy instruments that subsidise transport and thereby reinforce or enable a geographically widespread building structure can be difficult to change, since people have based decisions regarding where to live and work on their existence. At the same time it is important in future to avoid further such locking-in effects. The principles should be as follows.

8. *Encourage fuel-efficient passenger cars by influencing the choice of vehicle.*
  - a) *Ensure that the existing guidelines on consumer information about vehicles are observed.*
  - b) *“Tighten” the CO<sub>2</sub> differentiation in vehicle tax...*
  - c) *... or supplement it with a CO<sub>2</sub> differentiated sales tax.*
  
9. *Make work journeys and business trips sustainable.*
  - a) *Apply existing rules for taxation of parking benefits.*
  - b) *Exempt cycle and public transport benefits from tax.*
  - c) *Make the taxation allowance for travel independent of the mode of transport, and phase it out in the longer term. A phase-out can have social consequences for certain groups in society and the Government must therefore examine how this can be implemented in a balanced way.*
  - d) *Differentiate taxation of company cars according to their CO<sub>2</sub> emissions and also increase the fuel coefficient. In the longer term replace the system of company cars with incentives to companies to create alternative fuel car-pools.*
  
10. *Steer towards more efficient goods transport.*
  - a) *Tighten control of the compliance with existing goods transport regulations.*
  - b) *Encourage and accelerate standardisation efforts in this sector.*
  - c) *Increase the internalisation of external costs for road transport by means of rapid homogenisation of the energy tax...*
  - d) *...as well as by a relatively high mileage tax in exchange for other tax reductions for the road haulage industry.*
  
11. *Realise and maintain climate steering in the fuel tax.*
  - a) *Raise the CO<sub>2</sub> tax to the level necessary to achieve the climate objective.*
  - b) *Index-link the CO<sub>2</sub> tax to the development of GDP and perhaps to the development of fuel efficiency.*
  
12. *Signal that current targets – towards which the CO<sub>2</sub> tax is to steer – represent only the first step in climate policy. Future more stringent targets mean that the CO<sub>2</sub> tax may need to be adjusted upwards gradually.*

## 5. Recommendations by the Swedish Environmental Advisory Council

The magnitude of the climate challenge facing the transport sector requires efforts to be carried out with the utmost efficiency.<sup>1</sup> The Swedish Road Administration (SRA) emphasises that a transition must occur in three parallel investment areas: “renewable fuels”, “more efficient vehicles” and “transport-efficient building structure and demand”.<sup>2</sup> The Administration's calculations show that measures within the third investment area have considerable potential to make transport more efficient and to reduce its impact on the climate and other negative effects. The potential is particularly great as regards economic policy instruments and the planning of building and transport systems. The Environmental Advisory Council considers that this sector merits greater attention than has previously been the case.

The majority of actors agree that fuel prices will rise, either as a result of a proactive climate policy or due to a shortage of oil. That is another reason to focus on these measures since they can liberate actors from transport dependency.

The Environmental Advisory Council proposes a *Strategy for reduced transport dependency* with three angles of attack:

- (A) *Focus accessibility and sustainable transport solutions on the national level,*
- (B) *Strengthen planning tools so that over the longer term they promote sustainable geographical building structures and transport patterns,*

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<sup>1</sup> The targets in *Klimatstrategi för vägtransportsektorn (A climate strategy for the road transport sector)* are, using 1990 greenhouse gas emission levels as a baseline, to stabilise the level by 2010, to reduce emissions by at least 10 per cent by 2020 and to reduce emissions by at least 40 per cent by 2050 (Publication 2004:102, Swedish Road Administration, p. 50) According to forecasts and tables presented in the strategy we appear to need to reduce annual CO<sub>2</sub> emissions by road traffic by somewhere in the region of 5 Mton CO<sub>2</sub> by 2010, 9 Mton CO<sub>2</sub> by 2020 and 18 Mton CO<sub>2</sub> by 2050.

<sup>2</sup> *Klimatstrategi för transportsektorn (Climate strategy for the transport sector)*, Publication 2004:102, SRA.

*(C) Reform economic policy instruments so that they support sustainable location and transport decisions.*

We propose ten measures for reduced transport dependency. A strategy need not include exactly these measures. It ought to be possible to achieve the same results with a somewhat different combination of measures.

In part the Council conducts an argument about the potential and acceptance of the proposed measures. The Council wishes to underline that the assessments of potential are uncertain, e.g. they are based in some cases on relatively elementary inquiries and also they have not been processed or subjected to quality assessment. This list is not to be used out of context nor should the individual elements be aggregated without more detailed analysis. The Council urges the Government to qualify these assessments of potential when they indicate great possibilities in prioritised measures. The measures also seem justified on the basis of a number of perspectives, such as health, environment, congestion and resources. In a number of cases the measures have relatively high acceptance and increase the cogency of the policy area.

Some examples of potential are that:

- measures which give a more sustainable choice of vehicles can reduce CO<sub>2</sub> emissions from passenger cars by 5-25 per cent,
- measures which make work-related journeys more environmentally sound can reduce traffic volumes in the major metropolitan regions of Göteborg and Stockholm by 5-17 per cent,
- measures which increase the efficiency of work-related journeys by public actors and of distribution transport can reduce traffic by 5-10 per cent and 15-30 per cent, respectively.

Studies also indicate conversely that poor planning can in the longer term lock us into increased transport dependency. Some examples of the negative effects of poor physical planning are that:

- poorly considered regional town-planning and local expansion can have an effect on transport generally,
- the locating of retail trade outlets outside cities can cause a significant increase in car journeys for daily shopping,
- satellite housing developments make conditions more difficult for delivery and service traffic and also generate additional and longer car journeys.

## A) Focus accessibility and sustainable transport solutions at the national level

The Government can increase the tempo in and public acceptance of a policy in favour of reduced transport dependency by supplementing existing tools at the national level and by itself taking the lead as regards the following proposals.

*1) Create a platform for transport-efficient social structures and demand.* We need a strategic platform, based on cooperation between infrastructure, communications and social building policy, which in a long-term system perspective avoids locking us into transport dependency and realises the potential to reduce climate impact where it is greatest. The following elements are central to such a platform.

*1a) Create a vision for "A transport-efficient Sweden by 2050".* Such a vision should answer questions including the following: What would such a society be like? What possible long-term cost savings and gains could a forward-looking and consistently executed policy produce in various sectors?

*1b) Make more detailed assessments of potential, adopt time-framed objectives and develop robust strategies* for such a policy in the long, medium and short term.<sup>3</sup>

*1c) Adopt a national logistical plan for sustainable communications* that shows how the strategy can be implemented in practice. Various policy sectors and the authorities concerned can meet there to coordinate efforts. Such a plan should in particular indicate optimisation potential based on 'soft' investments, such as freight and travel logistics, and environmentally sound transport. Different political levels can be linked together through the inclusion, as important foundations, of regional and local transport plans (in accordance with proposals 4b) and 5b).

Finland intends to launch national logistics plans during its EU Presidency in the autumn of 2006 and the Swedish Association of Local Authorities and Regions is discussing a similar instrument. In this context the Council wishes to emphasise the importance of such plans being given a long-term perspective and sustainable focus.

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<sup>3</sup> According to the SRA's assessment of potential for this investment area, it is possible to bring about a reduction of the annual CO<sub>2</sub> emissions by fully 12 million tonnes CO<sub>2</sub> a year by 2050, compared with the predicted development.

## 2) *Improve the basis for investments by:*

2a) *Develop the socioeconomic analysis for comprehensive planning and investment decisions.* Government investments greater than SEK 10 million must currently be preceded by socioeconomic analysis in which both cost and benefit components are assessed. These and other analyses when carrying out comprehensive investment and planning measures need to be supplemented by methods which can provide holistic impact assessments of various alternative developments. These methods need to be able to provide answers to questions such as: Will transport dependency increase and, if so, what will the impact be? The accessibility of which social groups will increase/decrease and at what cost to society. The scenario technique, direction analyses or strategic impact assessments can all be used to make holistic assessments and to analyse social, economic and ecological advantages and disadvantages.

2b) *Present the land-use effects of modified traffic infrastructures.* The Government should ensure that accessibility standards are observed when infrastructure investments are made. Land-use governs traffic development in the short term, while the traffic system's characteristics govern land-use in the long term. This can be of crucial importance for long-term transport development.<sup>4</sup> Traffic plans and object analysis should therefore assess secondary land-use effects and the subsequent traffic effects of changes in the traffic system.

2c) *Give the national transport agencies the task of reporting how resources are allocated among different types of investment in accordance with the SRA's four-stage principle.* This will clarify resource allocation between 'soft' investments, such as logistics for freight and passenger transport, and traditional investments in transport infrastructure. It should also be apparent what the socioeconomic and ecological impact of these investments has been.

3) *Increase acceptance for, and the tempo of, the execution of this policy by taking the lead.* Work to make effective and environmentally sound transport the norm in the state sector by:

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<sup>4</sup> *Stadsutveckling för hållbara transporter (Urban development for sustainable transport)*, Report 5496, Swedish EPA, 2005, p. 22 ff..

3a) *Using public procurement to make transport more environmentally sound and more efficient.* It should be made easier to set standards for environmentally sound and efficient goods transport in public procurement procedures in which goods and transport are being procured at an inclusive price. It is at present possible in certain cases to stipulate the form of transport. The method is complicated since requirements can only be expressed in contract conditions.

The Government should take the lead and make its own goods transport more efficient and more environmentally sound by procuring transport and logistics separately where there is potential for coordination. The Government should also adopt a minimum target for procurement of transport services and only trade in services within the top quartile of the market.

This would create potential to reduce the environment impact of transport and to make resource economies. The City of Stockholm is testing a form of procurement in which goods and transport are separated. It is expected to result in a substantial reduction of CO<sub>2</sub> emissions from transport distribution services to units of the City administration, by switching to alternative-fuel vehicles and improving coordination. Improved coordination alone is expected to reduce transport services by 30 per cent and save working-time at goods reception facilities by the equivalent of SEK 14 million per year.<sup>5</sup>

3b) *The Government making environmentally sound travel the norm* in the course of its own activities. Some important steps are to:

- *adopt a travel policy* that puts a premium on sustainable alternatives. The Office of Urban Transportation in Göteborg and the Swedish Road Administration (SRA) in Borlänge have developed a travel policy and a mobility plan<sup>6</sup> to make travel more efficient and environmentally sound.
- *support environmentally sound transport alternatives and phase out those which have a substantial impact on the environment.* The Office of Urban Transportation in Göteborg has replaced

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<sup>5</sup> Official statement Ref no. 125-1215/2004 and Statement by the municipal board, Statement 2005:47, City of Stockholm, Enquiry by the City of Stockholm Office of Inquiries and Statistics, and discussion on 17 June 2005 with J. Hultgren, City of Stockholm Executive Office.

<sup>6</sup> Resepolicy för Trafikkontoret, Göteborgs stad (Travel policy for the Office of Urban Transportation, City of Göteborg), 12 December 2005 and *Plan för effektivare resor och transporter vid Vägverket i Borlänge (Plan for more efficient travel and transport at the Swedish Road Administration in Borlänge)*, SRA 2005.

employer-provided vehicles with pools of alternative fuel vehicles and public transport passes and is also considering a system of employer-provided bicycles.

Two municipal service administrations, in cooperation with the SRA, have improved logistics for business trips. Cautious assumptions about the potential indicate that better logistics for this transport can reduce traffic by 5-10 per cent and costs by about 10 per cent. The cost savings include reduced transport and more efficient use of vehicles. In addition there is a bonus in the shape of savings in working time. The SRA has carried out a preliminary analysis which indicates that, taken together, all the municipalities in Sweden could make cost savings of the order of SEK 400 million.<sup>7</sup>

## **B) Strengthen weak planning tools**

A relatively large proportion of transport is structurally conditioned. It depends on structural conditions in society, such as the location of housing, services, workplaces and infrastructure. This applies in particular to 'heavy transport', i.e. work and service-related journeys which in themselves bring no added value.<sup>8</sup> Making such transport more efficient can, in addition to reducing the impact on the climate and environment, reduce costs and produce qualitative gains for the actors concerned.

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<sup>7</sup> *Kommunerna kan spara miljoner på tjänsteresor (Municipalities can save millions in business trips)*, Press release 1 February 2001, SRA West Region, and *Handbok för bättre kommunala tjänsteresor (Handbook for better municipal business travel)*, Publication 2006:6, SRA.

<sup>8</sup> Such journeys are the opposite of voluntary travel and are often linked with displeasure, strain or privation. An obligatory journey can readily be eliminated or shortened if it gives the same return as regards its purpose, e.g. shopping or work. Roughly half the distance travelled by an individual during one year consists of obligatory journeys: work and service-related journeys. As regards goods transport there are also many journeys which with greater efficiency, e.g. through better freight-logistics, do not have a negative effect on the purposes of transport. (*Färder i framtiden - transporter i ett bärkraftigt samhälle (Journeys in the future - transport in a sustainable society)*), Steen et al, Report 1997:7, Swedish Transport and Communications Research Board).

4) *Create the conditions for adopting the regional climate challenge.* Long-term planning at the regional level has potential as regards transport. Studies indicate that the regional town planning structure can affect energy use for transport by 25 per cent and car transport by up to 20 per cent.<sup>9</sup> There are uncertainties in the analyses but they still give an indication of potential worth studying. Conscious steering of building development is of great importance for transport dependency since building development changes slowly and if the wrong direction is taken, the consequences persist for a long time to come. The following measures are central pre-conditions for the adoption of the regional climate challenge.

4a) *Create good regional coordination.* The regions must be encouraged to adopt the climate challenge as one of their main tasks and to understand how regional enlargement can be managed from this perspective. This requires good regional coordination. The role of the Parliamentary Commission on Social Responsibilities (Ansvarskommittén) is of decisive importance in this.

4b) *Adopt a methodology for sustainable transport planning.* By means of a sustainable regional town planning structure (e.g. multi-core metropolitan regions) and good regional public transport, the negative transport effects of regional expansion can be minimised. A methodology is needed in this work in order to be able to foresee the consequences of different alternative developments and in that way to combat negative effects in the social context, health and the environment. The methodology proposed by the EU Commission in the Sustainable Urban Transport Plan can be a guiding principle but may perhaps need further development for application at the regional level.

A minimal requirement as regards long-term regional planning is that Regional Development Plans and other regional plans should be subject to impact assessment on the basis of building development and transport perspectives. Government efforts to

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<sup>9</sup> *Fysiska strukturer för hållbar utveckling i medelstora och små städer och tätorter (Physical structures for sustainable development in medium-sized and small towns and urban areas)*, Falkheden, L., Malbert, B., 2000, p. 17 ff with reference to *Transportenergi i byer og pendlingsregioner (Transport energy in towns and metropolitan areas)*, Næss, P., Report 1993:2, Nordic Institute of Regional Policy Research, Oslo, and to *Regional samhällsplanering för ett miljöanpassat transportsystem (Regional physical planning to promote environmentally sound transport systems)*, Interim report for N, O and P-counties. Scenario Miljö 2010, VBB samhällsbyggnad 1995.

develop a national strategy for regional development during the spring of 2006<sup>10</sup> should integrate such a requirement. That is particularly important if EU Structural Fund resources for investment in transport infrastructure will be channelled through Regional Development Plans. New legislation in the planning and building sector should also pay heed to the above requirements.

*5) Reform planning tools to ensure sustainable local building development and transport.* At the local level a number of important approaches are needed in order over the short to medium-term to counter the effects of the structures contributing to increased transport dependency, and over the longer term to replace them altogether. Important sectors for action are:

- well-thought-out building development structures for major cities (decentralised concentration/multi-cores/'star-city') and for other densely-populated areas (single-core),
- concentration on already developed land, particularly around public transport nodes (this should also take into account the importance of retaining green spaces)
- provision of good local public transport,
- decentralised service, such as food-shops, schools and day-care centres
- limitation of car-parking areas and better vehicle-efficient availability (support for car-pooling and hiring).

One example of municipal planning for sustainable transport from Lund Municipality shows that targeted planning in combination with investments in environmentally sound transport can slow down the growth of car traffic in the municipal network by about 0.5 per cent per annum.<sup>11</sup>

A number of planning tools linked with the Swedish Planning and Building Act and related legislation provide inadequate or wrong guidance. New legislation within the planning and building sector should revise and supplement present planning tools. *The final report by the Committee on the Planning and Building Act, Får jag lov (May I have permission)*, was recently submitted to the Government. In the Council's view the proposals in the report are not satisfactory from the climate perspective. The present inquiry

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<sup>10</sup> The strategy is to constitute a platform for coordination between regional development policy and the EU policy for cohesion.

<sup>11</sup> *LundaMaTs, Uppmärksamhet och effekter 2004 (Sustainable transport system for Lund Municipality, Observation and effects, 2004)*, Trivector Traffic AB and Works Administration, Lund Municipality, 2005, p. 69.

about parking legislation should be supplemented. Reform should take place in accordance with the following points.

*5a) Link national environmental quality objectives more closely with the Planning and Building Act* so that it becomes an obligatory part of comprehensive and detailed planning. This link should be included in the general rules of consideration. Give the county administrative board more power to intervene when plans counteract these objectives.

*5b) Require municipal plans for sustainable transport* in accordance with the methodology in the Sustainable Urban Transport Plan proposed by the EU Commission.

*5c) Introduce scrutiny in accordance with the Swedish Environmental Code* where secondary effects such as car transport are taken into account as a natural part of the basis for decision. A minimal alternative is to make it possible to stipulate conditions for transport in the implementation contracts.

*5d) Revise the legislation on parking*, both relevant provisions in the Planning and Building Act and other legislation in such a way that it can be exploited with a view to putting a premium on environmentally sound alternatives and signals a more restrictive policy. If necessary the municipalities' possibilities to subsidise car-parks using tax revenue should also be limited.

### **C) Reform ill-directed economic policy instruments**

A number of economic policy instruments subsidise transport particularly road transport, and reinforce or make possible a geographically dispersed building development structure. Some of these policy instruments can be difficult to amend since it is on their existence that people have based their decisions about where to live and work. At the same time it is important in future to avoid further such locking-in effects. The principles should be as follows.

*6) Encourage fuel-efficient passenger cars by influencing the choice of vehicle.* Passenger cars in Sweden have the highest fuel consumption in Europe. According to the SRA there are major emissions and cost savings to be made in this sector. If all those purchasing cars consistently chose the petrol-driven model with the lowest fuel consumption, the average CO<sub>2</sub> emission would

diminish by 5-10 per cent. If they chose the model with the lowest fuel consumption within the same size group the average CO<sub>2</sub> emission would diminish by 20-25 per cent. Interventions which enable such potential savings to be realised would probably be readily accepted since the Swedish people's fuel bill would fall by SEK 10 billion per year.<sup>12</sup> If, when buying a new car, they chose smaller cars with lower fuel consumption, the emissions would diminish even more.

Here it is important to highlight the lifecycle cost when new cars are being chosen in order to achieve as strong a long-term steering effect as possible. The Council proposes the following measures.

*6a) Use information campaigns to influence the choice of vehicle.* Information about the fuel consumption of new passenger vehicles sold or leased within the EU should be made available to consumers.<sup>13</sup> In Sweden, information which by law should be made available<sup>14</sup> includes the fuel consumption, carbon-dioxide emission and environmental class of new passenger vehicles. These rules are applied to only a limited extent<sup>15</sup> and compliance control should be tightened up. More stringent application of existing legislation can perhaps be reinforced by making the labelling system more explicit, in accordance with the pattern employed in the UK or the Netherlands, and by means of an information campaign which highlights the long-term environmental and financial importance of making intelligent choices of vehicle.

Public acceptance for this measure is probably relatively high since it increases the chances of making better considered decisions when buying a car and hence of saving money. The recent rises in fuel prices also mean that the public is receptive to this type of information. It is also likely to increase trust in the policy, if existing legislation is enforced.

The cost of the first phase in the investment is probably low. It is a matter of using existing legislation to change the behaviour of the industry.

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<sup>12</sup> *Kan vi köpa det vi vill ha? (Can we buy what we want?)*, SRA, Publication 2004:13, p. 1 and *Varför köper vi svenskar Europas törstigaste bilar (Why do Swedes buy Europe's thirstiest cars?)* [www.vv.se](http://www.vv.se), SRA.

<sup>13</sup> EEC Directive 1999/94/EEC, Article 3.

<sup>14</sup> Marketing Act (1995:4450), Section 4, 2nd paragraph, and the Swedish Consumer Agency guidelines.

<sup>15</sup> See e.g. *PM om bilannonser, Underlagsrapporter till klimatstrategi för vägtransportsektorn (Memorandum on car advertisements, background report for the road transport sector's climate strategy)*, Publication 2004:103, SRA.

6b) *“Tighten” the CO<sub>2</sub> differentiation in vehicle tax.* Carbon-dioxide differentiation in vehicle tax, which is being introduced during 2006, does not have a insufficiently strong guidance effect on the purchase of new cars. The Government should in the next stage tighten up the wording or introduce a complementary CO<sub>2</sub>-differentiated sales tax. To prevent a watering-down of the steering effects, the CO<sub>2</sub> factor in the tax scale should perhaps be adjusted upwards by about 2 per cent per annum, in accordance with the Danish model.

In its comments on the SRA’s final report the Swedish Environmental Protection Agency proposes a tighter formulation of the vehicle tax which has potential to reduce CO<sub>2</sub> emissions by 0.1 million tonnes of CO<sub>2</sub>/year by 2010 and 0.5 million tonnes CO<sub>2</sub>/year by 2020.<sup>16</sup>

The Agency’s proposals mean that the average tax per car would remain unchanged, which should result in relatively high public acceptance. Acceptance for a higher CO<sub>2</sub> differentiation of the annual vehicle tax can increase if information is improved in parallel (in accordance with measure 6a) so that actors can take better-informed financial decisions about their choice of car, based on lifecycle costs.

6c) *Possibly complement this with a CO<sub>2</sub>-differentiated sales tax.* The Government should consider a CO<sub>2</sub>-differentiated sales tax. Such a tax should not include any limitations on size reductions. The proposal in the final report of the Commission on an Action Plan for Sustainable Household Consumption is of interest.<sup>17</sup>

7) *Make service and work-related journeys sustainable.* A large proportion of work and service-related travel is undertaken by car. This is partly because the tax rules are favourable to car use. The Council makes the following proposals for measures which upgrade environmentally sound and health-promoting transport, as well as successively phasing out or replacing the incentives for transport.

7a) *Apply existing rules for taxation of parking benefits.* Benefits in the form of free parking are taxable, but few currently actually pay

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<sup>16</sup> *Utvärdering av styrmedel i klimatpolitiken (Evaluation of climate policy instruments)*, Report 5394, Swedish EPA, 2004, p. 230 ff with reference to *Koldioxidrelaterad skatt på bilar (CO<sub>2</sub>-related vehicle taxation)*, Report 5187, Swedish EPA, 2002 and *Fiscal measures to reduce CO<sub>2</sub> emissions from new passenger cars*, European Commission, 2002.

<sup>17</sup> *Bilen, biffen, bostaden (The car, the steak and the home)* (Official Government Report 2005:51), p 113.

tax. Compliance control of existing taxation rules should be tightened.

There are divided opinions on whether the benefit of free parking is part of the present assessment of the tax-value of company cars. Free parking should not be included in the tax-assessment of company cars but should be handled within the system for taxation of parking benefits. The reason is that if the parking benefit is included in the car benefit at a nominal figure, the advantage it confers varies from place to place (since parking costs vary greatly).

Different studies indicate that parking costs have great importance for commuters' choice of means of transport.<sup>18</sup> They show that a strict application of taxation of parking benefits could reduce car traffic by between 5-10 per cent in Göteborg<sup>19</sup> and 13-17 per cent in Stockholm.<sup>20</sup> Stricter application also provides increased tax revenue. For the City of Stockholm, the figure is estimated at SEK 60 million per year<sup>21</sup> and in Sweden as a whole, the figure is estimated at about SEK 150 million per year.<sup>22</sup>

If the potential in the existing legislation is realised first, there will be greater cogency and legal rights in the exercise of policy, which in turn can increase public acceptance.

*7b) Environmentally sound and health-promoting travel benefits should be tax-exempt.* In urban areas, 70-80 per cent of car journeys are shorter than 3-4 km. These journeys can probably be replaced to a large extent by pedestrian, cycle and public transport.<sup>23</sup> In response to a questionnaire almost a quarter of those asked

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<sup>18</sup> i.a. *Vad betyder fri parkering för vägtrafiksituationen i Stockholmsområdet (How significant is free parking for road traffic in Greater Stockholm?)*, Jansson, J.-O., Wall, R., Department of Economics, Linköping University, 2002.

<sup>19</sup> *Djupintervjuer med avseende på val av färdmedel (In-depth interviews regarding choice of transport)*, Report 10752, Office of Urban Transportation, City of Göteborg.

<sup>20</sup> *Minskad trängsel genom förändrad parkeringspolitik (Less congestion by changing parking policy)*, Memorandum no 15:2003, Office of Regional Planning and Urban Transportation, Stockholm County Council, p. 3.

<sup>21</sup> This sum also includes higher employer contributions. It applies provided that 40 per cent of the individuals concerned continue to use their parking spaces, that they pay 50 per cent marginal rate of tax and that the value of the benefit is SEK 20 000/year. *Minskad trängsel genom förändrad parkeringspolitik (Less congestion by changing parking policy)*, Memorandum no 15:2003, Office of Regional Planning and Urban Transportation, Stockholm County Council, p. 15.)

<sup>22</sup> *Parkeringsförmån, Även förmånsbilar bör beskattas* (Parking benefits, company cars should also be taxed, Office of Urban Transportation, City of Göteborg, 2005, p. 3.

<sup>23</sup> *Tätortsbefolkningens strukturella bilberoende GIS-projektet Tillgänglighet i svenska städer 1980 and 1995, Ombearbetad upplaga (Structural car dependency among the urban population, GIS project Accessibility in Swedish towns and cities, 1980 and 1995, Revised edition)*, Reneland, M., Tema Stad & Trafik (Theme Town & Traffic), Department of Architecture, Chalmers University, 2001, pp. 4, 20, 21.

declared that they might contemplate changing their mode of transport if they were given free public transport passes.<sup>24</sup> There is often a big difference between potential and actual outcome in this kind of study, and for that reason further analysis or a large-scale experiment would be desirable. It is, however, clear that there is scope for influencing transport behaviour using financial incentives and that this scope is not being fully exploited.

The Government should remove the tax on bicycle and public transport benefits, e.g. public transport passes and cycle-leasing, so that enterprises and authorities can support their employees in the use of environmentally sound and health-promoting modes of transport. There are good financial policy grounds for equating these benefits with the existing tax-free benefits, e.g. membership of fitness-centres.

Public acceptance for these measures is high. According to a public opinion survey, 55 per cent of the population are of the view that employers should be entitled to give their employees a bicycle, and 67 per cent a bus pass, as tax-free salary benefits.<sup>25</sup>

7c) *The tax-allowance should be de-coupled from car journeys and phased out over time.* Tax-deductible car journeys encourage travel in general and thereby contribute to locking people into structural transport dependency. Existing rules for tax deductions also have other negative characteristics since they provide a financial incentive to use the car for work journeys and to use private cars on business. The system moreover encourages cheating. Research by the National Tax Board suggests that over half the tax deductions for travel involve cheating or errors<sup>26</sup>, equivalent to illegal tax subsidies of about SEK 3 billion annually.<sup>27</sup>

The tax deduction for travel can in the first phase be decoupled from the form of transport, according to the proposal by the Public Transport Committee<sup>28</sup>. If this reform is, as proposed, made expenditure-neutral for the Government, the tax deduction will be

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<sup>24</sup> *Djupintervjuer med avseende på val av färdmedel (In-depth interviews regarding choice of transport)*, Report 10752, Office of Urban Transportation, City of Göteborg.

<sup>25</sup> *Låt oss gynna miljövänligt resande* (Let's support environmentally friendly travel), Expressen newspaper, 19 June 2005, with reference to Sifo.

<sup>26</sup> *Resor till och från arbetet hårdgranskas (Work-related journeys under the microscope)*, press release, 1 April 2005, Tax Board - Linköping and *Avstånd ska göra avdrag (The further you travel, the more you can deduct)*, Svenska Dagbladet newspaper, 27 October 2004

<sup>27</sup> *Ändrat reseavdrag, Gynna hållbart resande via skattesedeln (Amending travel deductions, Favour sustainable travel via tax statements)*, Office of Urban Transportation, City of Göteborg.

<sup>28</sup> *Kollektivtrafik med människan i centrum (Passenger-focused public transport)* (Official Government Report 2003:67), p. 312 ff.

somewhat reduced. In this way, environmentally sound modes of transport will be upgraded and the general guidance in favour of travel will be weakened.

There are obstacles to changing the tax-deduction for travel. Even if the present system in the first instance defrays the cost of commuting in metropolitan regions, many households in sparsely-populated areas are dependent on the travel benefit. In the next stage, a partial phase-out might be made either in the metropolitan regions, or nationwide but with exceptions for, or compensation in, defined sparsely-populated areas.

7d) *Begin a conversion to alternative-fuel company-car pools.* Company cars for employees constitute an estimated 25 per cent of all new car sales<sup>29</sup>, which means that the taxation rules on company cars for employees have a significant effect on the composition of the vehicle fleet. An analysis in 1996 showed that, if those who have company cars had the same price-sensitivity as other private motorists, the total traffic in Stockholm County would diminish by 3 per cent and in the City of Stockholm by 4 per cent.<sup>30</sup>

The company car system should in the first stage be adjusted by raising the fuel coefficient so that the user of the car pays the full fuel cost for private use. This coefficient should probably be raised to approximately 1.8-2. In the next stage, the free fuel system should be phased out.

In addition the Government should consider introducing a CO<sub>2</sub> differential in the taxation of company cars. The system introduced in the UK in 2003 might serve as a model. There, the value of the tax-concession is assessed on the basis of a combination of two factors, namely the car's value and the annual distance driven, and the car's CO<sub>2</sub> emissions. The British model would mean that the standard value of the concession would be increased by 20-30 per cent for a petrol-driven car with above-average consumption for its size category, which would better reflect the cost of private use of a corresponding car. Assessment of the British system indicates significantly reduced private use and reduced CO<sub>2</sub> emissions from new company cars.<sup>31</sup>

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<sup>29</sup> *Bilförmåner påverkar utsläpp av koldioxid från bilar, (Company car benefits influence vehicle CO<sub>2</sub> emissions)* Report 5381, Swedish EPA, 2004, p. 7.

<sup>30</sup> *Kompletterande utvärdering av Naturskyddsföreningens förslag till innerstadszoner för Stockholm (Supplementary evaluation of the Swedish Society for Nature Conservation's proposals for Stockholm inner-city zones)*, Transek 1996, p. 10 and 16.

<sup>31</sup> *Bilen, biffen, bostaden (The car, the steak and the home)* (Official Government Report 2005:51), p. 116.

In the longer term, the company car benefit system should be replaced by an environmentally sound solution, e.g. a system providing an incentive for companies to use alternative-fuel car-pools. The Government should examine what incentives are necessary to encourage companies to apply such solutions. A precondition for efficient exploitation of such a system is that tax obstacles to private membership of alternative-fuel car-pools should be eliminated.

*8) Steer towards more efficient goods transport.* Long-distance freight transport is increasing very rapidly and one of a number of underlying causes is that advanced global division of labour is profitable when transport costs are low and there is a major difference in wage costs between high and low wage countries. Examples include fish-fingers that during an 80-day production journey are transported more than 44,000 kilometres from the fishing grounds in the North-East Atlantic, via China, to our Swedish dinner tables.<sup>32</sup> This example indicates the importance of long-term change in these cost relationships. Tax variation has a central role in this context and it is important that any tax reductions introduced should be arranged in such a way as to take these conditions into account.

The transport of goods by road has major external costs. The Council considers that the following measures which are partly intended to internalise these costs can contribute to making goods transport by road more efficient.

*8a) Tighten control of the compliance with existing goods transport regulations.* There is widespread cheating in lorry traffic, including overloading, excessive driving times and systematic infringements of speed limits. This cheating leads to a downward pressure on prices, distortion of competition, more rapid wear on the roads and increases in the environmental impact and the risk of accidents.<sup>33</sup> Tightening of the compliance control of existing rules for goods transport is of the utmost importance.

*8b) Encourage and accelerate standardisation efforts in the industry.* Despite political interest, the development of inter-modal

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<sup>32</sup> *Fiskpinnens skräckeresä* (*The fish-finger's journey of terror*), Aftonbladet 19 November 2005 and conversation on 15 December 2005 with Tina Westberg, Press Officer at Findus.

<sup>33</sup> *Överlast i lastbilstrafiken* (*Overloading in lorry transport*), Report 2004:9, TFK – Swedish National Road and Transport Research Institute, p.4.

transport has been moderate. This is because of various obstacles which affect price and quality, including:<sup>34</sup>

- The lack of standardisation of weights and measures: Sweden has not introduced the international standard for the transport of goods by rail<sup>35</sup>, but handles loads exceeding the Swedish standard profile as special transport which are covered by a whole series of rules. Nationally permitted dimensions and weights for lorries still vary somewhat between countries. Air containers are adapted to the body of the aircraft and the goods must therefore be reloaded.
- There are deficiencies in the standardisation of information systems, with the result that it takes time to identify goods and carriers, making it more difficult to secure loads.
- There is no international framework of rules for accountability and insurance issues for goods on load-carriers and the insurance of load carriers to ships or railways.
- There is a shortage of capacity on the railways.

The practical shortcomings listed above leave room for major potential reductions in CO<sub>2</sub> emissions in the transport sector. To realise them, the Government should support and encourage the work of standardisation in the industry.

*8c) Increase the internalisation of external costs for road transport by means of rapid homogenisation of the energy tax.* It is urgent to apply equal energy tax to both diesel and petrol, which creates conditions for greater internalisation of the external effects of transport. The proposed increase in the energy tax on diesel is nevertheless insufficient. We should adopt a plan to homogenise as rapidly as possible.

Diesel in environmental class 3 has higher energy content than diesel in environmental classes 1 and 2. In pursuit of the principle that energy tax and the energy content of the fuel should be exactly related, the tax should perhaps also reflect these differences.

*8d) Increase internalisation also by a relatively high mileage tax in exchange for other tax reductions for the haulage industry.* A mileage tax which gives increased costs for increased transport should be introduced in order to supplement the steering effect. Such a tax should as early as in the introductory phase be differentiated between urban and rural areas and set at the correct marginal cost

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<sup>34</sup> *Godstransporter i samverkan (Coordinated goods transport)* (Official Government Report 2003:39), p. 22–30.

<sup>35</sup> UIC 596-6

level without reduction of the energy tax on fuel. Compensation for the haulage contractors, such as a reduction of other costs, e.g. taxes or employers' social costs for labour, should instead be studied in greater detail. With this distribution of costs, even an unchanged total tax pressure would have a greater steering effect on traffic volume. It would also improve the competitiveness of the Swedish road haulage industry.

Switzerland has introduced a mileage-based duty system for heavy lorries (total weight over 3.5 tonnes). The duty is charged over the whole of the Swiss road network and depends on the distance driven and the vehicle's total weight and exhaust emissions. Assessment of the system shows that traffic growth has been curbed, the vehicle fleet has been adapted to more environmentally sound vehicles and the load capacity is better used. Organisational changes have also taken place within the transport industry, e.g. pooled journeys, cooperation and increase steering and planning activities. There are indications of a change in the choice of mode of transport, above all combined transport. The tax has so far had little influence on consumer prices.<sup>36</sup>

### *9) Adjust the CO<sub>2</sub> component of the fuel tax.*

*9a) Realise the steering effects in the CO<sub>2</sub> component of the fuel tax.* The difficulty of assessing the costs of CO<sub>2</sub> emissions has led to setting the CO<sub>2</sub> component of the fuel tax at a level at which we achieve the climate policy objective. The current trend in transport volume indicates that the level of the CO<sub>2</sub> tax has an insufficient steering effect. If the assumptions about the carbon content as the basis of the CO<sub>2</sub> tax are revised, leading to a lower CO<sub>2</sub> tax on diesel, this steering effect will be further eroded. The CO<sub>2</sub> tax is currently approximately SEK 0.9/kg CO<sub>2</sub>, but according to SIKÅ (Swedish Institute for Transport and Communications Analysis) should be SEK 2.7/kg CO<sub>2</sub> if we are to achieve the transport sector's objective of stabilising CO<sub>2</sub> emissions at the 1990 level by the year 2010.<sup>37</sup>

The level of this component of the fuel tax is also dependent on how effectively other economic policy instruments are exploited. The relatively low public acceptance for increases in CO<sub>2</sub> tax suggests that it would be wise first to bank simpler climate gains.

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<sup>36</sup> *Skatt på väg (Road tax proposals)* (Official Government Report 2004:63), p. 406.

<sup>37</sup> *Etappmål för en god miljö (Interim objectives for a good environment)*, report 2003:2, SIKÅ, p. 38. and *Trafikens externa effekter. Uppföljning och utveckling 2003 ((The external effects of traffic - Follow-up and trends 2003)*, report 2004:4, SIKÅ, p. 41.

If used in the right way, the CO<sub>2</sub> component can be seen as the safety net of climate policy.

*9b) Retain the steering effect by means of supplementary indexation.* One of the factors that most promotes car usage is the actors' increased financial scope. To maintain the steering effect, the CO<sub>2</sub> tax should be indexed on GDP development. If the CO<sub>2</sub> factor in the annual vehicle tax is not adjusted upwards annually in accordance with the development of fuel efficiency, a supplementary indexation should also be introduced. (Indexation on the development of fuel-efficiency ought perhaps to include both these economic policy instruments). An outline methodology for such indexation is to be found in the SRA's climate strategy.

If the plan is introduced at the beginning of 2007, the SRA's assessment of the policy instrument's effect is 0.1 million tonnes of CO<sub>2</sub> equivalents in the year 2010, 2.3 million tonnes in 2020 and 8 million tonnes in the year 2050. The national tax revenue is assessed to increase by SEK 1.3 billion in 2010, SEK 12 billion in 2020 and SEK 70 billion in 2050.<sup>38</sup>

Indexation of this kind has greater impact on low-income social groups, so that compensation for certain income groups should be considered, e.g. through increased basic tax allowances.

*Include transport in the emissions trading system – an alternative to increased CO<sub>2</sub> tax.* The EU trading system for emissions rights currently covers 46 per cent of the CO<sub>2</sub> emissions of the Member States. If the system is to be efficient, a long-term plan is necessary for how the emissions rights should diminish in scope, together with greater clarity so that the actors in the system do not hesitate to make investments in CO<sub>2</sub>-efficient technology. The EU Member States should jointly determine the total volume of emissions rights and harmonise the rules for allocation.

*Include all sectors in the emissions allowance* – There are proposals to include all sectors in the system for emissions trading. Such a solution has both advantages and disadvantages. The advantages are that one would have the same CO<sub>2</sub> price in all sectors (which at least in theory minimises the cost of achieving the overall CO<sub>2</sub> target) and that the target for the trading sector should be clearer in relation to the target in the Kyoto Protocol.

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<sup>38</sup> *Förslag till långsiktig plan för beskattning av drivmedel (Proposal for a long-term plan for fuel taxation)*, Publication 2004:103, SRA, p. 12.

The major and wholly decisive disadvantage is that it would be difficult to achieve the climate target with competitive industry setting the bar for all sectors and we would miss the opportunity to pursue a tougher climate policy for the transport and household sectors that are not exposed to competition. Currently the CO<sub>2</sub> tax for these sectors is approximately five times higher than for industry. If Sweden entered a common "bubble" covering the greater part of all sectors, the climate policy would moreover be harmonised in all EU countries. That would be unfortunate since it is initiatives by individual countries that historically have developed policy.

*An own bubble for the transport sector* – In its comments on the final report from the Renewable Vehicle Fuels Committee<sup>39</sup> the Swedish Society for Nature Conservation discusses an alternative solution with tradable fossil fuel rights which create an allowance of its own for the transport sector. Such a national system with "fossil fuel rights" is limited in volume by parliamentary decisions and by annual sales of fossil fuels so that the sector targets are achieved. This is another alternative solution which should be further investigated.

There are further objections to introducing transport into the trading system, but there is no space for an exhaustive discussion of them here. The Council has not adopted a position either for or against this solution, but would merely point to the above-mentioned problems which must be discussed and solved before serious debate about integration can take place.

*10) Signal that current targets – towards which the CO<sub>2</sub> tax is to steer – represent only the first step in climate policy.* The Council wishes to draw attention to the fact that the Kyoto Agreement and the target that has been adopted for the transport sector to implement by 2010 is only a first stage in the climate challenge. It is towards these relatively short-term ambitions that the CO<sub>2</sub> tax should steer. Over the longer term emissions need to reduce much more. Future more stringent targets mean that the CO<sub>2</sub> tax may need to be progressively adjusted upwards. It is urgent that both households and decision-takers in industry and the public sector should understand that we must reckon on continued price increases for fossil fuels. Clear political signals are necessary in order to create this understanding.

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<sup>39</sup> *Introduktion av förnybara fordonsbränslen (Introduction of renewable vehicle fuels)* (Official Government Report 2004:133).

## 6. Feasible impact assessment components

The emphasis of the Swedish Environmental Advisory Council has been on finding long-term strategies. The Council has also had the opportunity to develop and describe the impact of the various concrete measures proposed in the memorandum in more detail. Some of the measures have already been examined, others may need to be analysed more closely before decisions are taken. This chapter contains a brief discussion about the feasible components in and the basis of an impact assessment for a strategy for reduced transport dependency.

### Security of supply

<p><b>National objective</b>– The 2005 Statement of Government Policy pinpoints a new objective: <i>The conditions shall be created to end Sweden's dependency on fossil fuels by 2020.</i><sup>40</sup></p>
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Reduced transport increases our chances of being able to end Sweden's dependency on fossil fuels.

### Climate effects

Less transport dependency reduces greenhouse gas emissions. According to the UN Intergovernmental Panel on Climate Change (IPCC), the 1990s have almost certainly been the warmest decade since 1860<sup>41</sup>– and in all likelihood the warmest decade of the last 1 000 years. The IPCC also ascertains that the most of the temperature increase since the 1950s can be explained by human

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<sup>40</sup> *Statement of Government Policy*, 13 September 2005, p. 6.

<sup>41</sup> the year temperature measurements began to be systematically recorded.

activities, primarily greenhouse gas emissions from the use of fossil fuels, and that even more global warming is to be expected in the 21st century. The IPCC's scenarios indicate a global temperature increase of 1.4-5.8 °C between 1990 and 2100. The sea level is simultaneously expected to rise by 0.09-0.88 m and a number of other effects will manifest themselves.<sup>42</sup>

These temperature increases may have entirely different effects from one region and from one season to the next. A rise in the annual mean temperature may make extremely high temperatures more common. The SweClim research programme<sup>43</sup> has drawn up regional climate scenarios for Europe for the period 2070-2100. It paints a serious picture of the impact on southern Europe, with considerably higher mean temperatures than the global average. Daytime summer temperatures could be over 40 degrees in southern France and over 50 degrees in southern Spain in combination with substantially less rainfall. These changes will have serious socioeconomic consequences.<sup>44</sup>

According to SweClim, the effects in the Nordic countries will not be as serious even though the annual mean temperature is likely to increase slightly more in Sweden than the global average. Most striking is perhaps the increase in the lowest temperature during the year, which is expected to be 8-12 degrees for large parts of the country. This will have consequences for the natural environment. Some species will disappear whilst others will increase. The most serious consequences for society are likely to be more frequent extreme weather conditions such as storms and flooding as a result of the extreme rainfall levels.<sup>45</sup>

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<sup>42</sup> *Third Assessment Report, Climate Change 2001, Synthesis Report, Summary for Policymakers*, Intergovernmental Panel for Climate Change, p. 1-33.

<sup>43</sup> The Swedish Climate Regional Modelling Programme

<sup>44</sup> *Klimatstrategi för vägtransportsektorn (Climate strategy for the road transport sector)*, Publication 2004:102, Swedish Road Administration (SRA), p. 11, with reference to SweClim.

<sup>45</sup> *Klimatstrategi för vägtransportsektorn (Climate strategy for the road transport sector)*, Publication 2004:102, Swedish Road Administration (SRA), p. 11, with reference to SweClim.

## The environment

**National objectives** – Sweden has 16 national objectives for environmental quality<sup>46</sup>: Limited influence on climate, Clean air, Natural acidification only, A non-toxic environment, A protective ozone layer, A safe radiation environment, No eutrophication, Sustainable lakes and watercourses, High-quality groundwater, A balanced marine environment, Sustainable coastal areas and archipelagos, Flourishing wetlands, Sustainable forests, A varied agricultural landscape, A magnificent mountain environment, A good built environment and A rich flora and fauna. The objectives take a generation perspective, which means that important measures have to be taken by 2020. There are also more than 70 interim targets.

One of the targets for transport policy is to: *adapt the design and function of the transport system to the demand for a good and healthy living environment for all, where natural and cultural environments are protected from damage. Sound management of land, water, energy and other natural resources shall be promoted.* The design of the road transport system shall also contribute to the attainment of the national objectives for environmental quality<sup>47</sup>.

Less dependency on transport reduces the negative impact on the environment. Not only does road transport give rise to climate change but also affects our chances of fulfilling most of the 16 national objectives for environmental quality and fifty or so of the 70+ interim targets. The climate objective is, as mentioned previous, strongly affected by road transport. Some more key problems are described below:

- We will probably reach the eutrophication objective by 2020. Emissions of eutrophying substances from some sectors have fallen, but the health of the environment is not improving. Aerial precipitation, mostly from traffic, is responsible for a quarter of all nitrogen discharges into the sea.<sup>48</sup>

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<sup>46</sup> Svenska miljömål - delmål och åtgärdsstrategier (Swedish environmental objectives – interim targets and action strategies) (Government Bill 2000/01:130) and Svenska miljömål - ett gemensamt uppdrag (Swedish environmental objectives - a common task) (Government Bill 2004/05:150) and <http://www.miljomal.nu>.

<sup>47</sup> Appropriation directions for the Swedish Road Administration, 2004.

<sup>48</sup> Strategi för hav och kust utan övergödning (Strategy for a eutrophication-free sea and coastal areas), Memorandum 2005:1, Swedish Environmental Advisory Council, p. 13.

- Achievement of the acidification objective by 2020 is highly unlikely. During 2002, the precipitation of acidifying substances harmful to nature was exceeded in 17 percent of our lakes.<sup>49</sup> Transport contributes to the problems.
- Ground-level ozone, which is formed from road traffic emissions, causes crop and forest damage worth billions of Swedish kronor.<sup>50</sup>
- Road transport and its infrastructure affect the natural and cultural landscape by taking up large areas of land, breaking ecological relationships and disrupting cultural environments.
- Polluted run-off water from transport infrastructures affects the quality of water resources.

## Health

**National objective** – The national environmental objective for A good built environment shall be achieved within a generation and is formulated as follows: *Towns, urban areas and other built environments must offer a good, healthy living environment and contribute to a good regional and global environment. Natural and cultural values must be safeguarded and developed. Buildings and industrial facilities are to be located and developed in a sustainable fashion and so as to promote the long-term sound management of the land, water and other resources.*<sup>51</sup>

Road transport affects human health as it gives rise to traffic accidents as well as cardiovascular/pulmonary diseases and cancer.

Less structural dependency on transport will lead to less *air pollution*. Motor vehicle traffic is the dominant source of air pollution in the western world and causes two main types, exhaust emissions and the dispersion of particles attributed to vehicle wear and tear and road dust. The documented effects on public health are, e.g.:

- Vehicle emissions<sup>52</sup> they affect lung and heart function, cause cancer and contribute to increased mortality.

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<sup>49</sup> *Miljömalen - för barnens skull!* (Environmental objectives - for the sake of our children!) deFacto 2005, Environmental Objectives Council, p. 24.

<sup>50</sup> *Miljömalen - för barnens skull!* (Environmental objectives - for the sake of our children!) deFacto 2005, Environmental Objectives Council, p. 22.

<sup>51</sup> *Svenska miljömål - delmål och åtgärdsstrategier* (Swedish environmental objectives - interim targets and action strategies) (Government Bill 2000/01 130), p. 171.

<sup>52</sup> They contain several harmful substances including nitrogen oxides, hydrocarbons and combustion particles.

- Inhalable particles contribute to the death of over 5 000 people per year in Sweden.<sup>53</sup> A specific problem is the dispersion of carcinogenic substances from vehicle tyres.<sup>54</sup>
- Substances in vehicle emissions cause reactions in the atmosphere that form harmful compounds, such as ground-level ozone. Ground-level ozone irritates the airways, impairs lung function and is estimated to contribute to the death of more than 1 000 people in Sweden every year.<sup>55</sup>
- Emissions from transport also affect the quality of drinking water and animal fodder.

Less road transport reduces *traffic noise*. About 1.6 million people are affected by levels of traffic noise outside their homes that exceed the guideline values for acceptable environmental quality laid down by the Swedish Riksdag.<sup>56</sup> These indoor values are exceeded for nearly one million people.<sup>57</sup> Traffic noise makes it more difficult to understand speech and has both physiological effects, such as hypertension, and psychological effects, such as stress.<sup>58</sup> In the long run, traffic noise affects learning and sleep as well as increases the risk of cardiovascular disease. The socioeconomic costs of noise disturbance from road traffic are thought to be in the region of SEK 5-10 billion a year.<sup>59</sup>

Death and personal injury as a result of *road traffic accidents* is a major public health problem. Less road transport will give rise to fewer road traffic accidents. In 2004, nearly 500 people were killed in traffic accidents, just over 4 000 people were seriously injured

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<sup>53</sup> The source does not say how great a part motor vehicle traffic plays in this problem. (*Miljömålen (Environmental Objectives), deFacto 2005*, Swedish Environmental Advisory Council, p. 20.)

<sup>54</sup> *Miljömålen (Environmental Objectives), deFacto 2005*, Swedish Environmental Advisory Council, p. 30.

<sup>55</sup> The source does not say how great a part motor vehicle traffic plays in this problem. (*Miljömålen (Environmental Objectives), deFacto 2005*, Swedish Environmental Advisory Council, p. 22.)

<sup>56</sup> In 1997, the Riksdag adopted traffic noise guideline values which should not be exceeded during the construction of new housing or during the construction or major rebuilding of transport infrastructures: 30 dB(A) equivalent level indoors, 45 dB(A) maximum level indoors at night, 55 dB(A) equivalent level outdoors (immediate exterior), 70 dB(A) maximum level on patio/balcony adjacent to own's home. According to the Swedish National Board of Housing, Building and Planning, this also applies to existing housing and the indoor values are the most relevant.

<sup>57</sup> *Vägtransportsektorn (Road transport sector)*, Sectoral report, Publication 2005:28, Swedish Road Administration, p. 58.

<sup>58</sup> *Environmental Factors in Cardiovascular Disease*, Mats Rosenlund, Department of Environmental Medicine, Karolinska Institutet.

<sup>59</sup> *Vägtransportsektorn (Road transport sector)*, Sectoral report, Publication 2005:28, Swedish Road Administration, p. 58.

and over 22 000 received slight injuries.<sup>60</sup> The number of deaths has fallen by just over 10 percent since 1996, but the numbers of serious and slight injuries have risen by nearly 5 and just over 30 percent respectively.<sup>61</sup> The injuries affect the least protected road users to a high degree. In 2004, nearly 20 percent of those killed or seriously injured, in accidents involving motor vehicles, were moped riders, cyclists or pedestrians.<sup>62</sup>

The latest comprehensive estimate of the direct and indirect costs of road traffic accidents is based on the estimated real number of traffic accidents in 1995.<sup>63</sup> The total costs for that year amounted to SEK 14.8 billion (at 1995 prices).<sup>64</sup>

One consequence of unprotected road-users feeling less safe on the roads is that people stop walking and cycling. This may lead to reduced accessibility for certain social groups, both older people and children. In the long run, less opportunity to walk and cycle can lead to people leading more sedentary lifestyles, relating in overweight and other weight-related health problems. A specific trend in this context is parents being increasingly inclined to take their children to school by car,<sup>65</sup> which gives rise to even more car traffic close to the least protected road-users and reduces the children's daily exercise. Overweight and obesity are increasing among children. This also increases the risk of diseases such as diabetes, asthma and cardio-vascular disease.

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<sup>60</sup> Road traffic accidents reported to the police, broken down by degree of seriousness and number of injured persons, 1985-2004, [www.vv.se](http://www.vv.se) Note that the way the police report injuries differs from how hospitals do it. A comparison in two counties and one municipality showed that hospitals constantly registered more injuries. (*Vägtransportsektorn (Road transport sector)*, Sectoral report, Publication 2005:28, Swedish Road Administration, p. 22)

<sup>61</sup> Road traffic accidents reported to the police, broken down by degree of seriousness and number of injured persons, 1985-2004, [www.vv.se](http://www.vv.se)

<sup>62</sup> People seriously injured in road traffic accidents reported to the police, broken down by type of accident, 1985-2004, [www.vv.se](http://www.vv.se)

<sup>63</sup> This cost estimate is based on: 572 deaths, 11 185 seriously injured, 41 026 slightly injured and 633 000 suffering property damage.

<sup>64</sup> The estimate includes costs for medical care, production losses, administration and property damage. (*Vägtransportsektorn (Road transport sector)*, 2004 Sectoral report, Publication 2005:28, Swedish Road Administration, p. 22 with reference to Nilsson et al, 1997.)

<sup>65</sup> The new school system may be a contributory cause of more children being driven to school, since there is sometimes a lack of alternative transport between the home and the preferred school,

## Gender equality

**National objective** – The long-term gender equality objective for transport policy is that: *The transport system is designed so as to meet the transport needs of both women and men. Women and men shall have the same opportunity to influence the creation, design and administration of the transport system and their opinions are to carry the same weight.*<sup>66</sup>

Less transport dependency increases the scope for creating a more gender-equal society. Men and women have different patterns as regards gainful employment, unpaid care work and travelling.

Men spend more time on gainful employment and travel more on business.<sup>67</sup> They travel greater distances and drive the car more than women.<sup>68</sup> Men's journeys are quick and direct.<sup>69</sup> As their incomes rise, men's travel increases more than women's.<sup>70</sup>

Women are responsible for more household purchases and drop off/pick up their children from day-care more often than men do.<sup>71</sup> They travel shorter distances in total but more by public transport and bicycle than men do. Women's travel is often more complex since they often combine several 'tasks' into one journey.<sup>72</sup> Women with a driving license have less access to the family car than men.<sup>73</sup> Women have a more positive attitude to public transport than men,

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<sup>66</sup> *Infrastruktur för ett långsiktigt hållbart transportsystem (Infrastructure for a long-term sustainable transport system)* (Government Bill 2001/02:20) and *Jämställdhet, transporter och it (Gender equality, transport and IT)* (Official Government Report 2001:44), p. 54.

<sup>67</sup> *Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 10.

<sup>68</sup> Men more often drive and women are more often passengers in a car. As regards distance travelled, however, car use is about the same (*Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 5, with reference to the Swedish Institute for Transport and Communications Analysis, SIKÄ).

<sup>69</sup> *Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 6.

<sup>70</sup> *Res jämt, tankar kring ett jämställt transportsystem (Equal travel, thoughts about a gender-equal transport system)*, Publication 2005:100, Swedish Road Administration, p. 15.

<sup>71</sup> *Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 10 and *Res jämt, tankar kring ett jämställt transportsystem (Equal travel, thoughts about a gender-equal transport system)*, Swedish Road Administration 2005:100, p. 50, 51.

<sup>72</sup> *Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 6.

<sup>73</sup> This is particularly true of middle-aged and older women. (Lindén, A-L., *Allmänhetens miljöpåverkan, energi, mat, resor och socialt liv (The impact of the general public on the environment, energy, food, travel and social life)*, Carlssons förlag (publisher's), 2001, p. 124.)

which is strange since the public transport system has been built up according to male travelling patterns based on direct journeys to and from work and full-time employment.<sup>74</sup>

### Societal resources - today and in the future

Less transport dependency consumes fewer societal resources, e.g. in the form of land, infrastructure and maintenance, gives rise to fewer transport costs for households and companies and generates fewer costs for society, businesses and individuals, in the form of congestion and queues. The most compelling economic argument is, however, that efficient transport reduces the costs involved in preventing, rectifying or alleviating the negative effects of transport on the climate, environment and human health - costs that can be very considerable. If we do not act now to reduce structural transport dependency, we will 'lock' society into inefficient structures and resource-draining patterns of consumption that are expensive or impossible to change in the future.

### Jobs and export revenues

There are gains to be made. Every year Sweden exports systems and technical holistic solutions to an estimated value of SEK 100 billion, mostly in the environmental technology and infrastructure field. Project exports generate about 100 000 Swedish jobs a year.<sup>75</sup>

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The Environmental Export Commission (*Miljöutredningen*) predicted as early as 1998 that there would be a demand for green products and environmental technology on major markets.<sup>77</sup> Today, a similar major global demand for efficient transport

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<sup>74</sup> *Jämställdhetsperspektiv på resvanor i järnvägssystemet (A gender equality perspective on travel habits on the railways)*, Transek, Report 2004:9, p. 5.

<sup>75</sup> *Thomas Östros presenterar projektexport (Thomas Östros (Swedish Ministry of Industry) presents project exports)*, Press release 30 October 2005, Ministry for Foreign Affairs/Ministry of Industry, Employment and Communications.

<sup>76</sup> Environmental technology exports make up a significant share of the Swedish business sector with a total annual turnover of SEK 40 billion and exports of SEK 15 billion (*Miljöteknik ett starkt område för Sverige (Environmental technology - a strong area for Sweden)*, Press release, 21 June 2005, Ministry of Industry, Employment and Communications).

<sup>77</sup> *Sustainable Sweden - a SUCCESS story* (Official Government Report 1998:118).

solutions is predicted. An example of such solutions is the Bus Rapid Transit System in Curitiba, Brazil, which is now being copied by other cities in e.g. China, India, Chile, Columbia, Mexico and Peru. The system combines traffic planning with vehicle technology.<sup>78</sup>

Certain policy instruments can lead to a reduction in the sale of passenger cars and more of a reduction in the sale of Swedish-made cars than other cars, due to them being less energy-efficient.<sup>79</sup> Such an adaptation could well take place as long as clear, early warnings of the introduction of increasingly tighter legislation are given. Vehicle manufacturers, in the vanguard as far as the introduction of carbon dioxide-efficient technology is concerned, have already drawn market benefits from this, and will continue to draw even greater benefits as the threat of climate change grows.<sup>80</sup> The previously mentioned BRT project exemplifies this circumstance. One of Volvo Bussar's largest ever orders, for 1 700 buses, was received as part of such a public transport initiative in Santiago, Chile.

### **Discussion on funding**

The policy for efficient transport discussed in this memorandum could be pursued without making any impact on government finances as a whole. It is a question of channelling existing resources for building development and infrastructure into more sustainable alternatives.

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<sup>78</sup> *Trafikkaos ny marknad för Volvobussar (Traffic chaos - new market for Volvo buses)*, Miljörapporten (Environmental Report magazine), no 2, 2005.

<sup>79</sup> In an impact analysis of the Swedish EPA's proposal for carbon dioxide differentiation of yearly vehicle taxation, the market share of Swedish-made cars would decrease by 1 percent unless Swedish manufacturers started to make more energy-efficient models. (*Utvärdering av styrmedel i klimatpolitiken (Evaluation of climate policy instruments)*, Report 5394, Swedish EPA, 2004, p. 232.)

<sup>80</sup> *Getting it straight and keeping up the pressure*, European Environmental and Sustainable Development Advisory Councils network, 2005.

**Table 6.1** Income from energy-, environment- and vehicle-related taxes, accrued outcome, 2002 to 2006

SEK billion, current prices Year

Year	2002	2003	2004	2005*	2006*
Energy tax					
Electricity	13,97	15,65	17,20	18,96	18,51
Petrol	17,19	15,88	14,24	14,81	15,19
Fossil fuels excl petrol	5,98	4,87	3,68	4,53	4,69
CO <sub>2</sub> tax					
Petrol	7,95	9,56	11,20	11,04	10,55
Fossil fuels excl petrol	11,98	14,25	15,22	15,05	15,15
Special tax on electricity from nuclear	1,79	1,83	1,86	1,79	3,16
Sulphur tax on fuels	0,14	0,12	0,09	0,09	0,09
Special anti-acidification tax	0,06	0,06	0,05	0,05	0,05
Tax on crude tall oil	0,02	0,02	0,02	0,02	0,02
<b>Total (energy-related taxes)</b>	<b>59,08</b>	<b>62,24</b>	<b>63,56</b>	<b>66,34</b>	<b>67,41</b>
Vehicle tax	7,43	7,69	8,00	9,78	10,06
Road tolls for heavy-goods vehicles	0,74	0,64	0,72	0,77	0,82
Congestion tax					0,53
<b>Total (vehicle-related taxes)</b>	<b>8,17</b>	<b>8,33</b>	<b>8,72</b>	<b>10,55</b>	<b>11,41</b>
Green tax on fertilisers, pesticides	0,40	0,41	0,36	0,36	0,36
Waste tax	0,89	0,89	0,73	0,73	1,65
Tax on air travel/transport					0,96
Tax on natural gravel, etc.	0,12	0,22	0,23	0,24	0,30
<b>Total (all taxes)</b>	<b>68,66</b>	<b>72,09</b>	<b>73,60</b>	<b>78,22</b>	<b>82,09</b>

Note: \* denotes forecast data

Source: Ministry of Finance.<sup>81</sup>

Revenue from different energy-, environment- and vehicle-related taxes is estimated for 2006 at SEK 82 billion, which is about a quarter of the total revenue from taxes on goods and services.

<sup>81</sup> *Beräkningskonventioner för 2006 (Calculation conventions for 2006)*, Ministry of Finance, p. 115.