



# **The Way Ahead Towards a Greener, Safer and Smarter Road Transport System**

*Research & Innovation Strategy*

**Title:** The Way Ahead Towards a Greener, Safer and Smarter Road Transport System:  
Research & Innovation Strategy

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# Foreword

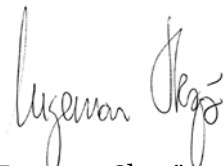
The Swedish Government commissioned the Swedish Road Administration (SRA) in a written instruction dated 14 June 2007 to prepare a research and innovation strategy to be completed by 31 December 2007 (Government Decision I 5, N2007/5608/IR). Since the SRA has sectoral responsibility for the development of the entire road transport system, we interpret the commission as a strategy that includes the entire road transport system with all of its components and operations.

The Government commission to the SRA is presented in this document: *The Way Ahead Towards a Greener, Safer and Smarter Road Transport System: Research & Innovation Strategy*.

The title is intended to emphasise the main message of our strategy, which is that the design of the road transport system must be based on the premise of both present and future problems and challenges. This must be undertaken from a perspective of innovation, with the SRA as a central player in a fruitful interaction with both academia and business. A common view exists in Europe regarding the design of the road transport system of the future and the way in which this should be brought about. Therefore, it is fundamental to our research and innovation strategy that we work together with Europe.

The strategy presented in this publication has been revised linguistically and editorially, and some figures have been added. The publication is also available in Swedish, *Den effektiva vägen framåt mot ett grönare, säkrare och smartare vägtransportsystem: Forsknings- och innovationsstrategi*, Publication number 2008:45.

Borlänge 8 April 2008



Ingemar Skogö



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# 1. The way ahead for desired renewal – Summary

Mobility is important for welfare. Therefore, the community must be able to provide its citizens and the commercial sector with a safe, efficient and reliable transport system. This system must be accessible to everyone under the same conditions, and must contribute towards countrywide employment and growth. Against this background, the SRA has prepared directions of travel for the next ten years in a strategic plan for 2008-2017 (1). The challenges on which this strategic plan is based are as follows:

1. An efficient and accessible transport system
2. Improved mobility for commuters and freight transport
3. Attractive built-up areas and cities with better transport options
4. Sensible use of the transport system
5. A sound and vigorous transport industry
6. Safe and energy-efficient vehicles with sustainable fuels
7. Simpler and clearer for the client
8. Efficient road maintenance
9. An attractive and capable SRA as part of an attractive transport sector

*In addition, the SRA has a further important challenge to live up to when carrying out of its operations, namely to aspire to be:*

10. A modern and efficient road administration in a changing world.

In future, greenhouse gas emissions and global warming will be key issues for society, and thus for the SRA as well. In this context we have an obligation to contribute towards a community with efficient transport, energy-efficient vehicles that use sustainable fuels, improved public transport, and energy-efficient freight transport.

Investment in improved road safety will continue, with the aim of Sweden retaining its world leadership position in this area. A guideline here is a systematic view that entails good interaction between the components of roads, vehicles and road users, and these being well adapted to one another.

Resources for expanding the road network are limited. Therefore, alternative financial solutions must be sought that give the option of carrying out new and important ventures at a faster rate. In addition, the SRA must continue to improve and streamline road maintenance to make it more energy efficient and cost effective. Included in this is to aim to strengthen collaboration with suppliers to encourage competition and a climate of innovation.

The SRA would like to become more involved in the surrounding world and that its creativity be put to use. Therefore, we will work more systematically on both national and international development work. The SRA also intends working towards long-term access to important and quali-

fied RD&D implementation environments. Efficient collaboration must also exist with and between these environments in order to strengthen international competitiveness.

The SRA aims to focus on client and community benefits regarding research and innovation in future, as we see this an efficient way of achieving fruitful collaboration across national and operations boundaries. We consider this view of research and innovation necessary for finding and introducing new solutions for bringing about the desired change in the road transport system. This is essential as the problems and challenges that face us are so complex that no player is capable of solving them alone.

The SRA is a sectoral authority and as such is responsible for problems that make it an important link, partly to the university and institute sector, and partly to the business community. We therefore have a central position in the innovation system. How we deal with the consequences of this and how we have made the research and innovation process the focal point is described in the SRA's Renewal strategy (2). According to this, individuals and the business sector are used as driving forces for attaining the desired renewal that must be carried out from a European and global perspective.

## 2. Framework for renewal (research and innovation)

### 2.1 VISION, GOALS, CHARACTERISTICS AND CATCHWORDS

The SRA has a number of characteristics and catchwords that lend support to our common approach to and common interpretation of our vision and goals. These help employees to make decisions and to take action in situations in which goals and rules do not give sufficient guidance. The catchwords in our daily work are **customer focus, overall perspective and efficiency**.

In this research and innovation strategy the SRA presents its plans for renewing and changing the road transport system efficiently and from an overall perspective so that it can be even more environmentally friendly (greener), provide better road safety (safer), and be more accessible and navigable (smarter).

As far as accessibility and navigability (mobility) are concerned, the Four-stage Principle (3) will be used for all planning, both at an overall level and regarding individual measures carried out in the road transport system. This involves the following: firstly, considered and tested measures that influence transport needs and choices; secondly, measures that allow more efficient use of the existing road network; thirdly, improvement measures; and in fourth and final place, new ventures. By implementing this strategy the design of the road transport system will become "smarter".

According to the Government Bill *Moderna transporter* [Modern Transports] (4)

*The overall transport policy goal is to safeguard the provision of socio-economically efficient and sustainable transport for citizens and the business community throughout the entire country.*

This overall goal calls attention to citizens and the business community as being important clients in the transport system. This main goal includes the following subsidiary goals:

- *An accessible transport system*
- *High transport quality*
- *Safe traffic*
- *A sustainable environment*
- *Positive regional development*
- *An equal opportunities transport system*

The SRA's vision is "to make the good journey possible". This presupposes that one aims to achieve all of the transport policy subsidiary goals since each concerns the quality of the journey in different respects. However, making "the good journey" an option also assumes that there is collaboration and dialogue with the "clients", i.e., citizens and the business community. By collaborating with representatives who act for citizens and the business community, we have established the requirements that need to be met by the road transport system. This basis has then been revised and weighed up in the light of the transport policy goals. The conclusions are presented in two client programmes, one for citizens (5) and one for the business community (6).

## **2.2 RESPONSIBILITY FOR OVERALL DEVELOPMENT AND THE NEED FOR AN OVERALL PERSPECTIVE**

The responsibility and position of the SRA regarding research and innovation is defined by the instruction (1997:652) that stipulates the following regarding research, development and demonstration (RD&D):

The SRA must work specifically towards ensuring that community-motivated and applied research, development and demonstration operations in the road transport system are planned, initiated, undertaken, documented and evaluated, and that the results are then disseminated.

In the appropriation directions for 2005, the SRA was commissioned by the Government to present its initiatives for creating a good climate of innovation and for stimulating innovation in its own operations. According to these directions, the report must be based on the Government strategy, Innovative Sweden (7). The Renewal Strategy (2) is the result of this Government commission. This strategy states the following goal for research and innovation operations:

By working together with its public and private collaborative partners, the SRA will bring about an efficient, visible and rapid rate of change in the road transport system. The work will take place with an overall view of the operations. The changes must result in the road transport system gradually becoming more efficient, safer, and better adapted to the environment, and also in citizens and the business sector finding it to be so.

A focal point of the Renewal Strategy is the SRA is particular sectoral responsibility for the development of the road transport system as stipulated in the sectoral Government Bill (8).

Over the years, this sectoral responsibility has created both conditions and demands for an overall perspective. This overall view has gradually become the basis for ensuring that the various components of the road transport system, i.e. vehicles, roads and road users, work well together. The key to this is joint and fruitful interaction between sectoral, authority and road maintenance tasks. We have successfully achieved this interchange, as an efficient means of bringing about the desired renewal of the road transport system.

The renewal strategy is based on the view of research and innovation initiated by the EU Commission for achieving the goals of the Lisbon Strategy. The common views held by the EU Commission and the SRA are described in the follow-up report (9) presented as a result of the TRA Conference in Gothenberg in 2006. The EU view of research and innovation was recently clarified further in the EU Green Paper (10) that deals with the further development of the European Research Area (ERA). The renewal strategy is in line with the EU views, which are also presented in the Green Paper.

### 2.3 A CENTRAL ROLE IN THE INNOVATION SYSTEM

The renewal strategy is also in line with The Swedish Reform Programme for Growth and Employment (11). The following excerpt from this action plan is worth noting: “Industrial research institutes constitute an important link between universities, university colleges and the business community.”

This statement concerns RD&D implementation. One can also see the need for such a link in the form of the sectoral authorities concerned regarding ordering and financing. The SRA is such a sectoral authority, and as it is responsible for problemsolving is an important link to universities and research institutes, as well as to the business community. Those for whom this is not obvious have had unreasonable expectations of the SRA over the years and have subjected the organisation to doubtful comparisons with established research councils. The same applies to those who are not clear about the scope of the various types of development projects handled by the SRA. This scope is illustrated below by way of the various categories, I – VI.

Planning horizon	Development of the Road Transport System (VTS) and its position in the community	Development of products and services that citizens and the business community encounter when using the Road Transport System (external products and services)	Development of the organisation and work methods, choice of materials, etc. for the efficient delivery of products and services
Shortterm view	I	II	III
Longterm view	IV	V	VI

Research councils focus primarily on scientific relevance in research and development, while public and private players place the main focus on community and industrial relevance, i.e., the usefulness of the result. The SRA, having sectoral responsibility, takes a central stance between these

two views, which is to say that the SRA takes both scientific relevance and usefulness into account in order to succeed in our operations.

Accordingly, the SRA has a central position in the innovation system. Therefore, collaboration with academic seats of learning and research institutes has developed in the way described in section 6. Collaboration with trade and industry has also developed systematically. See section 5.

## 2.4 DEMANDS FOR ETHICAL AND SCIENTIFIC STANDARDS

Research and innovation operations undertaken by the SRA cannot be expected to have the same strict requirements as those of research councils. Nevertheless, it is still important that the necessary degree of logic, objectivity and accuracy are adhered to. At the same time, these requirements are generally seen as reasonable in a government administration if the authority concerned is to be considered trustworthy. The SRA strives to be seen as trustworthy, open, and a creative community builder.

Openness strengthens trustworthiness. The fact that the SRA takes pains to be regarded as a creative community builder has resulted in the establishment of an “ethical and scientific council” made up of practised researchers in different fields. It is preferable that these researchers take an independent stance in relation to the SRA and those we engage to carry out RD&D. The council is also involved in evaluating research and innovation operations undertaken by the SRA and in providing the SRA with continuous advice. This also concerns the SRA taking due ethical consideration into account in its developmental operations. In this way the SRA has an important discourse partner when interpreting and applying Act 2003:460 on the ethical review of research involving humans. Road users, often without being aware of doing so, participate in development projects carried out on streets and roads in which traffic measurements are taken and followed up.

## 2.5 THE RESEARCH AND INNOVATION PROCESS DEFINED

The research and innovation process is a focal point of the Renewal Strategy (2). Seven elements are defined in this process. These are as follows:

1. **Business intelligence:** creating access to already known knowledge and solutions
2. **Research:** generating new knowledge that has not yet been discovered
3. **Arriving at new ideas:** jump-starting an idea in order to reach a new solution
4. **Development:** using ideas for producing new solutions
5. **Demonstration:** making the development results (the new solution) visible with a prototype
6. **Carrying out (implementation):** taking the necessary steps in all categories for putting the new solution to general use
7. **Innovation:** putting the new solution to general use, i.e., creating renewal.

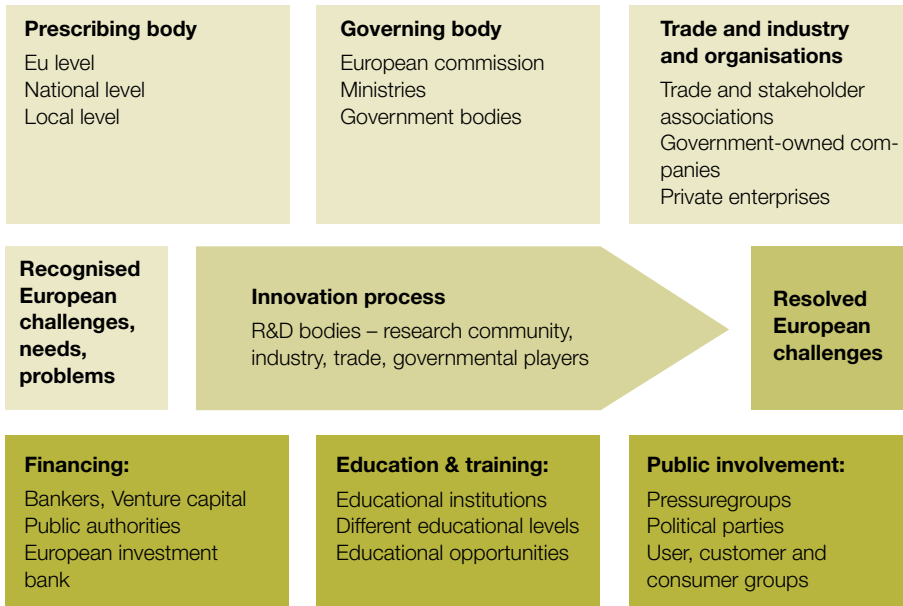


Figure 1. Research and innovation process at the centre. Source: Renewal of the Road Transport Sector...(2)

The concept “development” is used as a collective concept in the SRA in order to cover all of these activities (elements). These concern everyone to a greater or lesser degree in order to achieve the desired renewal of various operations.

## 2.6 GIVING PRIORITY TO AND MANAGING THE DESIRED RENEWAL

According to the Renewal Strategy, research and innovation as it is described in its broader sense above, is a later premise. This means that this operation is given priority and is managed in the same way as all other SRA operations. Therefore, no special RD&D programme in addition to this strategic plan exists any longer. (1)

Giving priority to and managing development operations in a wider sense begins with challenges at a strategic level. These are then channelled into investment areas, which are then transformed into projects. (See figure 2.) These span a wide spectrum. This allows projects to be grouped into the six categories as set out in section 2.3.

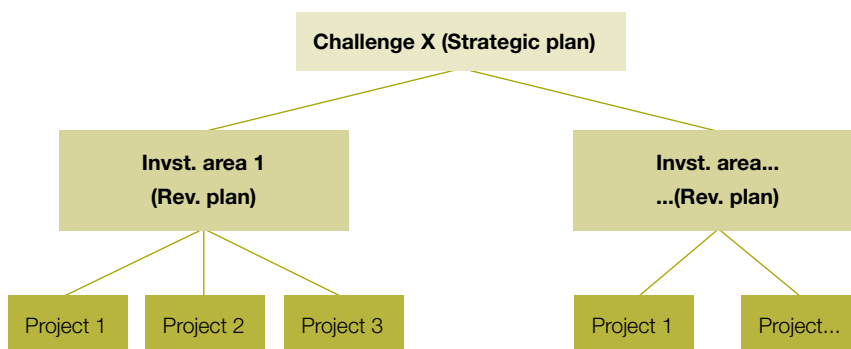


Figure 2. Various levels of development operations, strategic, tactical, operative respectively.

## 3. Agenda for urgent renewal

Mobility is important for welfare. Therefore, the community must be able to provide citizens and the commercial sector with a safe, efficient and reliable transport system. This system must be accessible to everyone under the same conditions, and must contribute towards countrywide employment and growth. Against this background, the SRA has prepared directions of travel for the next ten years in a Strategic Plan for 2008-2017 (1). The challenges that form the basis of the strategic plan are presented in sections 3.1–3.9. In addition, the SRA has a more obvious and introspective task for its operations. This is presented in section 3.10.

Development operations undertaken by the SRA begin with challenges at a strategic level. For each challenge the investment areas are indicated for the period 2008-2010. These are also set out in section 3.1 – 3.10.

Work in the investment areas is carried out in the form of various projects. These may constitute research, development, demonstration or addressing new solutions, as well as combinations of these activities. See section 2.5.

### 3.1 A COMMUNITY WITH EFFICIENT AND ACCESSIBLE TRANSPORT

Since one of the biggest challenges the community faces is to effectively reduce greenhouse gas emissions, this presupposes a transport-efficient society. At the same time, the road transport system must ensure a high level of accessibility and navigability. Therefore, the SRA aims to be essential at an early stage of community planning in order to contribute to constructive proposals and impact assessments.

Investment areas for the coming three-year period are as follows:

- New strategies and methods that contribute to increased collaboration in the planning process at an early stage regarding transport-efficient solutions.
- New strategies and methods that contribute to changes in the community and the infrastructure that facilitate transport-efficient accessibility and result in sustainable development.
- New economic and administrative sanctions and reward systems for enhanced transport efficiency and accessibility.

### 3.2 IMPROVED MOBILITY FOR COMMUTERS AND GOODS TRANSPORT

Efficient means of travel to and from work and favourable conditions for freight transport are crucial for sustainable growth and welfare. Navigability must be improved on important roads with heavy traffic flows by means of increased traffic information and better collaboration between traffic laws and client-orientated operating standards on these roads.

Investment areas for the coming three-year period are as follows:

- Client-orientated operating and maintenance services
- New road user information services (across traffic law boundaries)
- New cost-effective methods for increased sustainable mobility (navigability, reliability and reduced vulnerability through increased vitality)

- New solutions for energy-efficient freight transport
- New road and street concepts for safer mobility that conform to the needs of clients and the business community

### **3.3 ATTRACTIVE BUILT-UP AREAS AND CITIES WITH IMPROVED TRANSPORT SYSTEMS**

Streets and roads in built-up areas should be secure meeting places for people and should also be easily navigable for working commuters and freight transport. There is a great demand in larger cities for accessible and reliable transport systems. There is also a simultaneous need to reduce the harmful effects of traffic on health and the environment. Deficient accessibility in the transport system due to congestion, for example, should not necessarily place limitations on economic growth.

Investment areas for the coming three-year period are as follows:

- New methods and strategies that support sustainable urban development
- New and improved solutions for public transport and for distribution and service traffic
- Efficient traffic management and control
- New solutions for built-up areas adapted to accommodate unprotected road users.

### **3.4 SENSIBLE USE OF THE TRANSPORT SYSTEM**

Understanding how to react and behave in traffic should be simple. The design of the road transport system must be such that it supports and helps people in making sensible choices and obeying traffic regulations. Better safety and security, less impact on the environment and more efficient use of energy in traffic is achieved through better insight, knowledge, support, stimulation and surveillance.

Investment areas for the coming three-year period are as follows:

- Economic incentives and legal controls that promote the sensible and correct use of the road transport system
- More efficient surveillance methods for increased safety and security
- Education, information and support services that promote sensible and correct use of the road transport system

### **3.5 A SOUND AND VIABLE TRANSPORT INDUSTRY**

A well-functioning transport industry is of crucial importance for Swedish export, for consumers, and for a long-term sustainable transport system. The SRA works together with industry to solve various problems. This has a positive effect on the external environment, road safety and the work environment, and also raises the standard of transport services.

Investment areas for the coming three-year period are as follows:

- Regulations for commercial traffic that are appropriate and easy to comprehend and efficient following up of the observance of these
- Support services for the correct and easy application of commercial traffic regulations

### **3.6 SAFE AND ENERGY-EFFICIENT VEHICLES WITH SUSTAINABLE FUELS**

In order to achieve road safety and environmental objectives, vehicles must be safer and more energy efficient. There must be a reduction of both harmful emissions and noise caused by road traffic. The SRA must act as a source of knowledge and as a motivator in this respect and must provide decision makers, both nationally and internationally, with the basis for long-term, sustainable environmental and road safety work.

Investment areas for the coming three-year period are as follows:

- Energy-efficient vehicles and fuels and their usage
- New measures to reduce the harmful effects of vehicles and fuels on air quality and noise creation
- Safer vehicles by way of integrated vehicle-based safety systems.

### **3.7 SIMPLER AND CLEARER FOR THE CLIENT**

The SRA must be open and alert regarding the needs of citizens and trade and industry - our clients - and must also be clear about its assignments and the conditions attached to these. Citizens and the business community must find it easy to deal with the SRA.

Investment areas for the coming three-year period are as follows:

- Services that are of great benefit to clients and that live up to Government demands for an efficient e-administration
- Clearer and easily comprehensible regulations
- New methods and strategies for enhanced client communication

### **3.8 EFFICIENT ROAD MAINTENANCE**

Road maintenance must be streamlined in order to meet the needs of clients, citizens and the business community. The SRA must be an active client and supplier and must contribute towards improvements in the construction industry. Technological production must be developed and stimulated. Road maintenance must be financed in a robust and flexible manner. This will enable the SRA to plan for the long-term and carry out its operations efficiently.

Investment areas for the coming three-year period are as follows:

- New sustainable and cost-effective technical solutions, production methods and materials.
- Development of fruitful collaboration with suppliers that promotes competition and innovation
- An efficient and homogeneous permit and admissibility process, and guidelines and the means for administering it.
- Alternative forms of financing (public-private collaboration, etc)
- Management of operations and maintenance (Life Cycle Costing (LCC), permit assessments, travel value, etc).

### **3.9 AN ATTRACTIVE AND CAPABLE ROAD ADMINISTRATION AS PART OF AN ATTRACTIVE TRANSPORT SECTOR**

Access to a capable labour force is crucial for a well-functioning transport system. Therefore, the road transport sector must be able to attract and retain creative, involved and capable employees. The SRA as a workplace must be characterised by progressive assignments, favourable working conditions, equality, and diversity.

Investment areas for the coming three-year period are as follows:

- New methods and strategies for enhancing collaboration between players in both national and international arenas

### **3.10 A MODERN AND EFFICIENT ROAD ADMINISTRATION IN A CHANGING WORLD**

Over and above the challenges presented in section 3.1–3.9, the SRA has a further important task to work at, namely, that of carrying out its own operations efficiently while keeping pace with the needs and demands of the surrounding world.

Investment areas for the coming three-year period are as follows:

- Organisational efficiency and modern management and control.
- Well-organised document and financial management and efficient information channels.

## **4. Collaborations across national boundaries**

### **4.1 SWEDISH AND EUROPEAN VIEWPOINTS**

Transport policy and innovation policy visions and strategies are integrated. This applies to the EU and Sweden, and also to the SRA. This is described in the SRA strategy European Way Ahead for the Renewal of Roads and Road Transport (9). The main theme is the common European view of how roads and road transport in Europe must be developed in order to cope with future challenges.

The European Commission gives credit to technological platforms and attaches importance to the way in which these are used. Therefore, it is of crucial importance that collaboration with these platforms is well planned. In this way networks can be created and contact made at a European level with important decision makers. The SRA applies the collaboration model in the table below.

Level	Europe	Sweden	SRA
<b>What will be accomplished?</b>	White paper (EU overview) (14)	Modern Transports (4)	Strategic plan (1)
<b>Dialogue and information forum</b>	Technological platforms ERTRAC & ECTP	ERTRAC (ECTP) Drafting group*	SRA management
<b>How will this be done?</b>	Aho report (15) and Green Paper (10)	Innovative Sweden (7) and Action programme (11)	Renewal strategy (2)

\* Discussions on the establishment of the group are still underway. The group will be created indirectly within the framework of the IVA's (Royal Swedish Academy of Engineering Sciences) project on the future of transport, planned for spring 2008. An equivalent Swedish group already exists for ECTP (European Construction Technology Platform), with BIC (the Swedish Construction Sector Innovation Centre) as coordinator. The SRA is a member of BIC, see [www.bic.nu](http://www.bic.nu).)

The renewal strategy has two sub-strategies. One of these is a programme for international RD&D collaboration (12) and the other is a standardisation strategy (13). The latter concerns RD&D operations indirectly, by showing that the standardisation committee at a European level can function as a strategic network for the exchange of information on planned and ongoing RD&D operations. Standardisation, additionally, works as an effective instrument for introducing new solutions on a large scale.

The cornerstones of this international RD&D collaboration (12) are:

- Participating in and following up work done by technological platforms, European Road Transport Research Advisory Council (ERTRAC) and European Construction Technology Platform (ECTP) (See [www.ertrac.org](http://www.ertrac.org) and [www.ectp.org](http://www.ectp.org), respectively)
- Participating in collaboration with ERA-NET ROAD (See [www.road-era.net](http://www.road-era.net))
- Participating in Nordic collaboration with NordFoU (see [www.nordfou.org](http://www.nordfou.org)).

ERTRAC work resulted in the publication of RD&D requirements in 2006 (16). In this, concrete proposals were presented to the EU Commission before publication of the seventh framework programme at the beginning of 2007. These RD&D requirements (16) have had a significant effect on and are clearly presented in the EU seventh framework programme for research and technological development.

In October 2004, European road administrations and ERA-NET issued an application to the EU Commission within the framework of CEDR operations (TG Research) (See [www.cedr.fr](http://www.cedr.fr)). The EU Commission accepted the application in June 2005. This collaboration, "Coordination and Implementation of Road Research in Europe", has advanced to such an extent that the SRA, which is responsible for both of the final stages, has contributed with important involvement and work investment. By working together the more long-term RD&D requirements have been identified. With this as a basic premise, a follow-up analysis has been carried out to demonstrate the RD&D areas at a strategic level likely to derive the greatest benefit from future transnational collaboration. These RD&D needs are presented in an action plan (17) for continued collaboration in 2008. In addition, the EU Commission has reserved space in the seventh

framework programme to accommodate step 2 of the ERA-NET ROAD collaboration, intended to start at the beginning of 2009.

ERA-NET ROAD collaboration has shown that it is indeed possible to find working models for administering and financing RD&D assignments across national boundaries. These models are described in a separate report (18).

The NordFoU collaboration between road administrations in Sweden, Denmark, Finland, Iceland and Norway began when it had been established that no specific RD&D standing committee existed in the Nordic Road Association (NVF). The Norwegian Public Roads Administration initiated an informal collaboration for the exchange of information on current RD&D plans, and for ongoing and concluded RD&D projects. This collaboration has now been formalised, with joint advertising ventures, etc. This is the result of a collaboration agreement that was entered into by Nordic road administration heads in December 2004.

## **4.2 FIVE-STAGE PRINCIPLE FOR INCREASED EFFICIENCY**

A main theme in the “European strategy” (9) is that the problems Sweden faces are often not unique and thus do not require unique solutions. Therefore, the focus in future will be to bring home existing solutions. In cases where solutions are not yet available we will find ways of solving problems together with the other players involved. This approach allows problems and challenges to be solved in a more cost-effective manner. The basic idea behind this is that with a greater degree of international participation and collaboration the SRA will receive greater returns from its invested resources that are also of a higher standard.

The SRA has established the “five-stage principle for research and innovation” as being a critical success factor for the future. This will allow the realisation of potential efficiency and quality profits through European collaboration, as described in section 4.1. This strategy implies the following:

1. If a solution for the current challenge or problem already exists in the surrounding world, the SRA will use it in the Swedish road transport system (or within the SRA itself).
2. If a solution for a current challenge or problem is produced at the expense of the EU (by being part of a framework programme), the SRA will attempt to steer the result and contribute towards it being used appropriately. This can, however, require co-financing from either the SRA or another Swedish RD&D financier.
3. If it is likely that the current problem has already been identified in Europe, the SRA will pool expenses in order to find a joint solution through collaboration with, for example, ERA-NET ROAD (CEDR TG Research) or ERA-NET TRANSPORT. In the latter collaboration, VINNOVA is the Swedish participant, although the SRA also takes part.
4. NordFoU collaboration will be used if a particular problem or question has a connection to typically Nordic climatic or traffic conditions.
5. The SRA finances and orders RD&D activities first when the SRA itself is responsible for the problem and when no solution is available abroad or can be found in another way, for example, through collaboration with the business sector or other public bodies.

Point 5 above concerns national collaboration within Sweden. This is elaborated further in sections 5 and 6.

This five-stage principle substantiates and contributes towards the establishment of the European Research Area (ERA) in the road transport area.

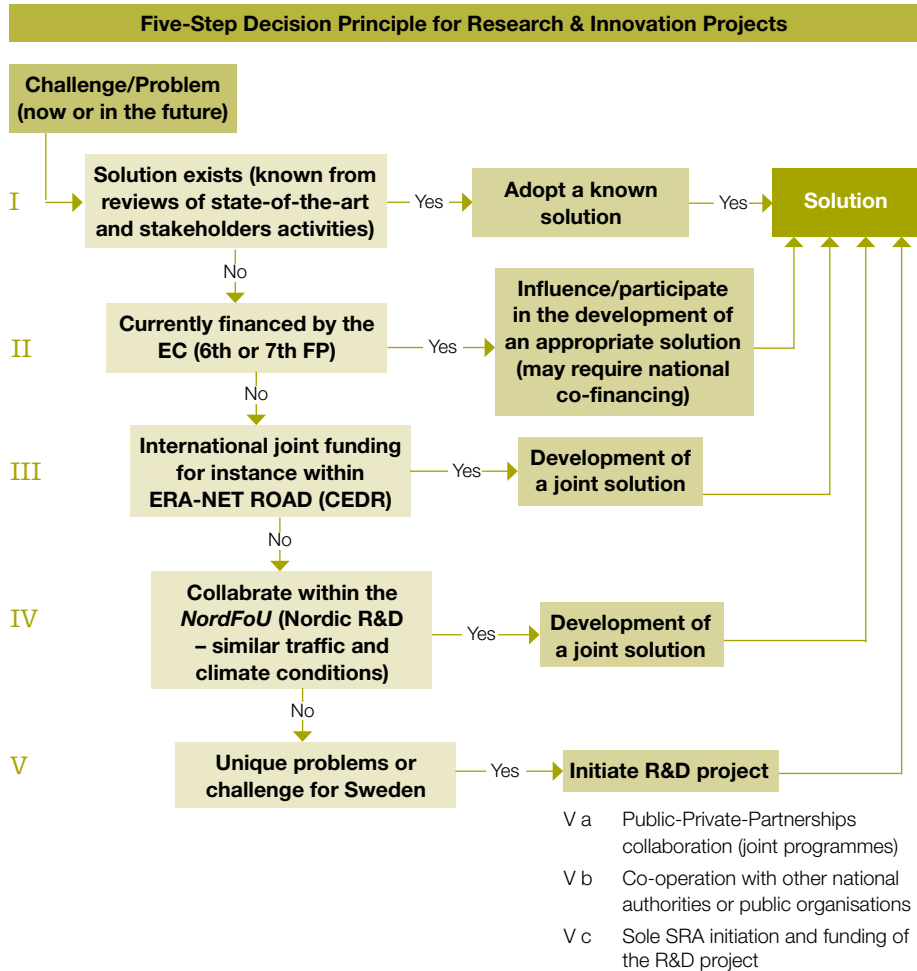


Figure 3. Five-Step Principle for research and innovation

## 5. Collaboration with trade and industry

### 5.1 JOINT INDUSTRIAL RD&D PROGRAMMES

The basic premise for being able to carry out RD&D in collaboration with the commercial sector must be the synergy that exists between transport and business policy goals and company economic policy goals. That this collaboration is indeed feasible is shown by the positive experience the SRA has derived from the following joint industrial RD&D programmes:

- The Emissions Research Programme (EMFO)
- Intelligent Vehicle Safety Systems (IVSS)
- Förnyelse i anläggningsbranschen [Renewal in the construction industry] (FIA)
- The Social and Economic Significance of the Automobile (BISEK)
- RD&D collaboration with the Swedish Association of Local Authorities and Regions (SKL)

Information about these industrial programmes and formal agreements is available by visiting the SRA website at: [http://www.vv.se/templates/page3\\_\\_\\_1280.aspx](http://www.vv.se/templates/page3___1280.aspx)

This type of public-private RD&D collaboration is encouraged by the EU Commission as is made clear in the latest "Green Paper" (10) on the desired further development of a European Research Area (ERA).

The SRA intends starting a number of joint industrial initiatives when the time is right. The latest initiative, "Klimatneutrala godstransporter på väg" [Climate neutral goods transport on the road] (19), began on 7 November 2007 in collaboration with Chalmers, the vehicle and petroleum industry, and one of the larger shipping companies. More information about this can be found by visiting the SRA's website: [http://www.vv.se/filer/48982/Klimatneutrala\\_godstransporter\\_lo.pdf](http://www.vv.se/filer/48982/Klimatneutrala_godstransporter_lo.pdf)

## **5.2 COMMERCIALISATION OF DEVELOPMENT RESULTS**

The SRA support initiatives for developing new solutions in trade and industry provided they contribute towards the advancement of the road transport system in the desired direction. This support is given in various ways. In order to give impetus to this aim, the SRA signed a collaborative agreement in December 2006 with Innovationsbron AB, which has risk capital at its disposal (Diary Number AL 90A 2006:24588). By collaborating with Innovationsbron AB, interaction with the private business sector can be developed as described in the Nutek report *Säker trafik för goda affärer* [Safe traffic for good business] (20).

## **5.3 THE APPROACH TO INTELLECTUAL PROPERTY RIGHTS**

A prerequisite for the SRA being able to collaborate with the commercial sector in a favourable and trustworthy way is the consistent and well-considered handling of intellectual property rights. A number of approaches for dealing with intellectual property rights were established on 29 October 2007 (Diary Number AL 90 A 207:27515). These include recommendations that serve as guidelines and which can be applied to the various situations the SRA might encounter. These approaches are as follows:

- Search for the solutions of others (via patent databases, etc.).
- Map the existence of intellectual property rights before reaching a decision on any initial research and development projects, and take this knowledge into consideration.
- Secure general access to the use of a defined solution by ensuring that the SRA owns or obtains immaterial property rights, if there is reason for doing so.
- Pay attention to the existence of intellectual property rights so as not to unduly favour anyone where tender form wording favours monopolies.
- Deal with employees ideas that are worth patenting in a consistent and well-considered way.
- The basic principle that goes hand in hand with these recommendations is to first define the immaterial property rights before making a decision. Therefore, think before you act!

## 6. Collaboration with academic seats of learning and research institutes

In 2004, Banverket, the Swedish Energy Agency, VINNOVA, and the SRA presented a joint strategy for transport-related RD&D (21). The aim was to secure access to important RD&D environments and to prepare for a joint European RD&D implementation and procurement market. In this strategy, roles and responsibility are divided up amongst the authorities in order to generate stable and long-term planning conditions for important RD&D environments in Sweden. The SRA has lived up to its commitments as mentioned in this strategy by applying the concept of virtual RD&D centres (Swedish Networks of Excellence (SNoE)) as was proposed in a 2002 NVF report (22). The SRA has so far established six such centres:

- Virtual RD&D Centre for Bridges and Tunnels (FUD-BT)
- Centre for a Sustainable Transport System (CELEST)
- Transport telematics R&D group Sweden (ITS) (VFUDC-TTS)
- Swedish Intermodal transport research centre (Sir-C)
- Road Technology (RT)
- Road Planning and Design (RPD)

The strategy (21), which was presented to the Government in May 2004, emphasises the importance of collaboration when coordinating the various operations of the authorities concerned. The TRANSAM Group, in which research-funded authorities in the transport sector participate, was established for this purpose. See the following website

<http://www.vinnova.se/Verksamhet/Transporter/TRANSAM/>

The main aim of establishing virtual RD&D centres is to strengthen international competitiveness. The SRA intends giving further impetus to this aim by developing the concept, partly to acquire players from the commercial sector as heads, and partly to generate a Nordic dimension - a Nordic Networks of Excellence (NNoE). The latter initiative is the result of an agreement entered into in Oslo on 20 November 2007 within the framework of NordFoU collaboration.

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## 8. Websites with important reference documents

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