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RESEARCH ACTIVITIES IN THE FIELD OF RAILWAY TRANSPORT

Transmitted by the Government of Sweden

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SWEDEN

RESEARCH ACTIVITIES IN THE FIELD OF RAILWAY TRANSPORT

Dnr 1996-0239	Establishment of new railway links - influence on the travel market and urban development. A study of the Stockholm – Eskilstuna link
Project leader: Bo-Lennart Nelldal	Research institute: Kungliga Tekniska Högskolan Inst för infrastruktur och samhällsplanering Trafik- och transportplanering 100 44 STOCKHOLM
Abstract:	Large investments are just now being made in the railway-system in Sweden, e.g. in the Mälardalen-region near Stockholm. This will result in shorter travelling times and new regional commuting patterns with increasing market share for the railway. There are now interesting possibilities to do research before and after the opening of the new link between Stockholm and Eskilstuna. The aim of this project is to study the customers preferences of the supply, the changes in travel behaviour, living and real estate market.

Funding: Skr

1996	1997	1998	1999	2000	2001
130 000	320 000	320 000	320 000	320 000	140 000

Dnr 1996-0548	Mode choice and travel demand between Stockholm and Arlanda
Project leader: Christer Lindh	Research institute: Kungliga Tekniska Högskolan Inst för infrastruktur och samhällsplanering Trafik- och transportplanering 100 44 STOCKHOLM
Abstract:	The introduction of a new train service “Arlandabanan” will change the competitive situation for bus and car modes to the airport Arlanda, but also to a certain extent for the long range travel from and to Stockholm. The aims of the project are to study the effect on travel demand to test forecast methods based primarily on Stated Preference and especially the SP-methods predictability as a function of time of start of the new train. Repeated data collection using both SP and RP before and after start of the operation will make it possible to compare SP and RP. Using models from the combined use of SP-and RP-data will make it possible to analyse if RP-data gives any extra value to the SP-models. The results will be presented so that a comparison with analysis of the Svealandbanan.

Funding:Skr

1997	1998	1999	2000	2001
543 000	644 000	644 000	370 000	254 000

Dnr 1996-0616	Effects on Society as a Whole by Means of Competition Promotion within Road and Railway Operations and Maintenance - R13
Project leader: Lars Olof Persson	Research institute: Kungliga Tekniska Högskolan Centrum för drift och underhåll av infrastruktur­anläggningar 100 44 STOCKHOLM
Abstract:	Against a background of mostly Swedish experiences for procurement of road and railway operations and maintenance, this Ph. D project aims to demonstrate and explain problems and effects caused by the on-going structural transformation through competition promotion in operations and maintenance.

Funding:Skr

1997	1998	1999	2000	2001
150 000	150 000	150 000	150 000	150 000

Dnr 1997-0131	Efficient train systems: market, operations, train concepts, valuations and economy
Project leader: Bo-Lennart Nelldal	Research institute: Kungliga Tekniska Högskolan Järnvägsgruppen 100 44 STOCKHOLM
Abstract:	<p>The project aims at finding methods to raise attractiveness and lower costs for passenger rail services.</p> <p>The project is a joint project with the Rail research group at KTH. The present research rests on a preliminary study in 1996.</p> <p>The department of Traffic and Planning will make deepened research in following five areas:</p> <ul style="list-style-type: none"> - Passengers valuations of timetable-, comfort- and service factors - Traffic production and coordination of passenger and freight traffic - Train concepts for various markets - Impact on railways market and competitiveness - Evaluation methods - system analysis - Economic analysis of complete train systems

Funding:Skr

1997	1998	1999	2000	2001
34 000	776 000	771 000	887 000	887 000

Dnr 1997-0213	Expert Centre: Traffic environment for the elderly and disabled
Project leader: Agneta Ståhl	Research institute: Universitetet i Lund - LTH Inst för teknik och samhälle Trafikplanering Box 118 221 00 LUND
Abstract:	Research on traffic must be allowed long-term acquisition of knowledge based on a holistic perspective. An interdisciplinary Expert Centre will be established in the area of Traffic Environment for the Elderly and Disabled. It encompasses four areas: public transport (publicly financed transportation respectively regularly scheduled), street layout, IT (car drivers respectively public transport) and vehicles for publicly financed transportation. The Centre includes doctoral and post-doctoral researchers from five disciplines. Its activities shall (a) contribute to realizing society's goals for the integration and normalization of the elderly and disabled, (b) establish and interdisciplinary research academy, and (c) disseminate knowledge about the traffic environment of these people in the future.

Funding:Skr

1997	1998	1999	2000	2001	2002	2003	2004
900 000	1 800 000	1 800 000	1 300 000	1 800 000	1 800 000	420 000	80 000

Dnr 1997-0270	Loss of scale advantages from competition in railway system
Project leader: Arne Jensen	Research institute: Universitetet i Göteborg Företagsekonomiska institutionen Handelshögskolan Box 610 405 30 GÖTEBORG
Abstract:	The aim of the project is to increase our knowledge of the economic significance of scale advantages when competition is introduced in railway systems. Methodologically, the studies are based on intra-company resource and cost studies which consider the organisational and systemic changes following from competition. The project is expected to result in (1) perspectives, concepts and models for the analysis of costs of lost scale advantages following from competition on railway networks and (2) empirical measures of these costs in different important situations (e.g. train products, links) for the Swedish railway network.

Funding:Skr

1997	1998	1999	2000	2001
232 000	502 000	502 000	502 000	232 000

Dnr 1997-0447	Housholds and urban structures in sustainable cities
Project leader: Arne Kaijser	Research institute: Kungliga Tekniska Högskolan Inst för Industriell ekonomi och organisation 100 44 STOCKHOLM

Funding:Skr

1998	1999	2000	2001
1 464 000	1 465 000	965 000	500 000

Dnr 1997-0600	Theme Management - Optimising methods for the allocation in operation and maintenance activities - Doctoral project CDU: R2
Project leader: Per Olov Lindberg	Research institute: Kungliga Tekniska Högskolan Centrum för drift och underhåll av infrastrukturanläggningar 100 44 STOCKHOLM
Abstract:	This is one of the doctoral projects in an integrated theme for development of optimisation models in infrastructure operation and maintenance. It employs a general optimization approach within the tradition of operations research. The project will utilize existing models for evaluation of effects, relationship between conditions and effects, relations between operation/maintenance standards and conditions, the change of condition etc. The project aims at developing applied optimization models to create a scientific base for the dimensioning of resources on strategic, program and project level. The theory form is based on decision models and Markov chains from Pavements Management Systems.

Funding:Skr

1998	1999	2000	2001	2002
300 000	300 000	300 000	300 000	150 000

Dnr 1997-0703	Human-Machine Interaction and Operator Interfaces for Rail Traffic Management and Control
Project leader: Bengt Sandblad	Research institute: Universitetet i Uppsala Inst för informationsteknologi Box 337 751 03 UPPSALA

Abstract:	Control of tomorrow's train traffic must be based on new principles and lead to more optimal performance. The objectives are to study human behaviour in management and control of complex, dynamic systems, and to develop knowledge for future organization and technical support for train traffic control. Important is the design of human-machine interfaces and prototypes will be developed and tested. The new interfaces must lead to high efficiency and safety at the same time as cognitive aspects of the work environment are considered. The project is a part of the Swedish National Rail Administration's future development. The goal is to introduce research competencies from systems analysis, human-machine interaction and design of user interfaces.
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Funding:Skr

1998	1999	2000	2001	2002	2003
645 000	645 000	645 000	645 000	645 000	645 000

Dnr 1998-0202	Insulation of blocks of flats against groundborne noise from trains
Project leader: Sten Ljunggren	Research institute: Kungl Tekniska Högskolan Byggnader och installationer Brinellvägen 34 100 44 STOCKHOLM
Abstract:	The project will be devoted to the development of prediction models for three types of noise control measures: Foundation mat, building structure with wave guide break and foundation with impedance mismatching. The first one of these types is common today, but is regarded as expensive. It has also been shown that existing prediction model over predicts its noise-reducing effect. The two new types are not yet tested. They are expected to be very cost-effective as they are easy to implement when erecting new blocks of flats. The work will be carried out with the help of analytical models. I turn a wave guide approach, models for plate edge mobilities and a model for plate transfer mobilities will be used.

Funding:Skr

1999	2000	2001	2002
444 114	155 727	444 114	273 357

Dnr 1998-0564	Understanding siting controversy: the case of Väst kustbanan
Project leader: Åsa Boholm	Research institute: Universitetet i Göteborg Centrum för forskning om offentlig sektor CEFOS Box 720 405 30 GÖTEBORG

Abstract:	<p>Questions referring to the risks and benefits of large-scale industrial plants or infrastructure projects like building roads, railways or airfields which have a considerable impact on the local community and its environment, are often highly controversial and strongly contested. This proposal wants to explore the responses of local communities to the ongoing project to modernize Väst kustbanan, between Gothenburg and Malmö. The research problem bears on one of the crucial issues for contemporary industrial societies: How can globally designed and conceived projects necessary for economic growth, be implemented in a local environment, in a community situated in a historically and traditionally conditioned context of time and space?</p>
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Funding:Skr

1999	2000	2001
637 000	696 000	809 000

Dnr 1998-0572	Research theme: Organisation and Incentives, part 2
Project leader: Lars Hultkrantz	Research institute: Centrum för Transportekonomi Box 760 781 27 BORLÄNGE
Abstract:	<p>The theme grant has been the core funding of a research group in economic analysis of transportation and communications at Högskolan Dalarna 1993-98. This proposal covers part 2.</p> <p>The focus of the theme is on the effect use of the transport system and the existing infrastructure: design of various policy instruments; competition and implementation of the Internal Market in the railway sector; integration of the transport sector in an applied general equilibrium model; environmental policy aspects of transport policy .</p>

Funding:Skr

1999	2000	2001
1 034 000	357 000	164 000

Dnr 1998-0634	New Nordic prediction method for rail noise - Source modelling, emission measurements and final verification of method
Project leader: Hans Jonasson	Research institute: Sveriges Forsknings- och Provningsinstitut Box 857 501 15 BORÅS
Abstract:	<p>The project aims at developing a new Nordic prediction method as far as some railway specific parts are concerned and to verify this method by measurements. The following parts are included:</p> <ul style="list-style-type: none"> - Description and test of a noise emission test method for whole trains

	<p>and for different partial sources and mapping of what type of source data are needed in addition to those already available.</p> <p>Modelling of a train as noise source in such a way that point source theory can be used to predict railway noise levels under different sound propagation conditions.</p> <p>- Quality assurance and verification of the new Nordic prediction method by measurements</p>
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Funding:Skr

1999	2000	2001
220 000	220 000	220 000

Dnr 1999-0231	Mathematical models for complex problems in transport applications; extended cooperation between VTI and the University of Linköping.
Project leader: Pontus Matstoms	Research institute: Statens Väg- och Transportforskningsinst 581 95 LINKÖPING
Abstract:	<p>The project aims to increase the understanding for complex mathematical models in transport application; and to extend the cooperation between VTI and the Math Dept at Linköping Univ. Two-ticentiat project will be initiated and cooperation will be encouraged by seminars, courses, and by student projects at VTI.</p> <p>Complex models, e.g. travel pattern and environmental models, are often used as important tools in the transport sector. The purpose is to develop methods for sensitivity and uncertainty analysis.</p> <p>Many transport systems can be described by hierarchical systems where decisions at different levels influence each other. One example is the calibration of OD-matrices. The purpose is to develop methods for 2-level problems.</p>

Funding:Skr

1999	2000	2001	2002
776 864	1 553 728	1 553 728	776 864

Dnr 1999-0242	The Botnia line
Project leader: Lars Westin	Research institute: Universitetet i Umeå Centrum för regionalvetenskap CERUM Samhällsvetarhuset 901 87 UMEÅ
Abstract:	The overall aim is to analyse the process suggestion-decision-

	<p>construction-impact with respect to the Bothnia line the period late 1800-2045. The current railway represents a sunk cost which has prohibited alternative developments paths. Critical points in time are related to projection, construction, first traffic and final transfer the year 2045 to the state. The cost-benefit analysis behind the decision is compared with the spatial time path of the realised benefits in the region. Ex ante expectations among different actors are compared with ex post outcomes. Benefits to traffic are compared with benefits to land owners.</p>
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Funding:Skr

1999	2000	2001	2002	2003
571 000	1 233 000	1 140 000	1 071 000	446 000

Dnr 1999-0269	Integration of transport modelling, spatial statistics and geographical information systems
Project leader: Lars Lundqvist	<p>Research institute: Kungliga Tekniska Högskolan Inst för infrastruktur och samhällsplanering Transport och lokaliseringsanalys 100 44 STOCKHOLM</p>
Abstract:	<p>A unique and advanced forecasting and analysis system for regional traffic planning is developed with the following properties: 1. It relies on best practice models for transport demand (trip frequency, destination choice, mode choice) combined with equilibrium models for route choice in congested networks. 2. It contains efficient methods for estimation of model parameters. 3. It includes new methods from spatial statistics for evaluation of flow data and flow models. 4. It supports the computation of traffic policy criteria measuring the function and quality of the transport system (e.g. costs and benefits, accessibility). 5. The forecasting and analysis system is fully integrated in a user-friendly geographic information system.</p>

Funding:Skr

1999	2000	2001
347 600	646 200	297 600

Dnr 1999-0459	Noise from trains and cars
Project leader: Kjell Spång	<p>Research institute: MISTRA – Stiftelsen för Miljöstrategisk Forskning Gamla Brogatan 36-38, 4 tr 111 20 STOCKHOLM</p>

Funding:Skr

1999	2001	2002
2 400 000	1 200 000	1 200 000

Dnr 1999-0588	Public Transportation from a Service Management Perspective - market and Service Orientation in Public Transportation
Project leader: Lars Haglund	Research institute: Universitetet i Karlstad Centrum för tjänsteforskning CTF 651 88 KARLSTAD
Abstract:	<p>Our research programme PUBLIC TRANSPORTATION FORM A SERVICE MANAGEMENT PERSPECTIVE started in 1996. We are developing our research with three ongoing projects:</p> <p>Project 1: measures to Improve Quality and Travellers' Attitude towards Public Transport</p> <p>Project 2: The use of the results of Quality measurements</p> <p>Project 3: Restructuring Work - the relationships between industrial Changes, Working Conditions and Service Quality Improvements</p>

Funding:Skr

2000	2001	2002	2003
610 000	1 018 500	350 750	641 350

Dnr 1999-0636	New forms for competition and competitive bidding in the public sector.
Project leader: Jan-Eric Nilsson	Research institute: Centrum för Transportekonomi Box 760 781 27 BORLÄNGE
Abstract:	<p>The purpose of the project is to analyse several disparate issues having three aspects in common: (a) The theoretical hub is the economic theory for auctions and procurement processes; (b) economic experiments to assess the appropriate design of the mechanisms in each specific case, and (c) the auction or the procurement is handled by way of electronic bidding over the Internet.</p> <p>Three activities are undertaken within the framework of the project: (1) Continued development and in particular testing of inverse procurement of railway slots. (2) Procurement of road maintenance. (3) Development of the appropriate forms for competition within the market for mobile phones.</p>

Funding:Skr

2000	2001	2002
559 000	458 000	113 000

Dnr 1999-0704	Transport analysis and forecasting systems
Project leader: Staffan Algers	Research institute: Kungliga Tekniska Högskolan Inst för infrastruktur och samhällsplanering Transport och lokaliseringsanalys 100 44 STOCKHOLM
Abstract:	The scientific area comprises development of transportations models, estimation techniques for such models and application within national and regional forecasting systems. Specific emphasize is placed on introduction of IT-functions in the transportation system and on studies of dependencies between transport and telecommunication.

Funding:Skr

2000	2001	2002	2003
0	1 000 000	1 048 000	1 024 000

Dnr 1999-0709	Transport future studies.
Project leader: Sven Hunhammar	Research institute: Försvarets forskningsanstalt Institutionen för miljöstrategiska studier 172 90 STOCKHOLM
Abstract:	The aim of this continuation of the current Swedish transport future study is to analyse how a sustainable transport system could be reached given different external scenarios. The delimitation is the travel and freight connected to the lifestyles of Swedes. The approach being used is a modified kind of back casting, in order to accommodate to an unpredictable future. The outcome is expected to be flexible or robust policy alternatives. Especially five areas are in focus. These are high-speed transport, and decoupling a of freight transport, network nodes and telecommuting, indirect resource use for transport and the dynamic processes of change. The possibilities of sustainable high-speed transport will be studied in a doctoral thesis.

Funding:Skr

2000	2001	2002	2003
960 000	960 000	672 000	288 000

Dnr 1999-0760	Efficient train systems for rail-freight transportation - an introductory study
Project leader:	Research institute:

Bo-Lennart Nelldal	Kungliga Tekniska Högskolan Järnvägsgruppen 100 44 STOCKHOLM
Abstract:	The aim of the study is to describe how the future rail freight transportation system can be designed depending on the technical development potential of the railway, the market and the customers demand and preferences. The critical factors will be defined from the point of view of the market and the railways possibly future performance on basis of available technique and how it can be used in different products for example in wagon-load systems for heavy transports, intermodal systems and high speed freight systems. An evaluation will be done from business economy point of view for different products. There will also be a study of restrictions depending on inertia, adjustments on the market and environmental factors. There will be an effort to define the railways future market in Sweden and in an international perspective. Finally some important strategical factors that is relevant for further research and development will be described.

Funding:Skr

2001	2002
1 120 000	760 000

Dnr 1999-0768	Research programme on the regional development impacts of the Öresund bridge - project plan for 2000-2003 and beyond
Project leader: Folke Snickars	Research institute: Kungliga Tekniska Högskolan Inst för infrastruktur och samhällsplanering Trafik- och transportplanering 100 44 STOCKHOLM
Abstract:	The study of the regional development impacts of the Öresund bridge encompasses three time stages and embraces four aspects of impacts. One of the stages concerns the period before the opening of the bridge while two refer to the period after the bridge opening in the year 2000. Impacts occurring in the regional economy, in transport and land-use patterns, and in the environment will be followed. Tools developed, adapted and used are regional economic models, integrated land-use/transport/environment models, ex ante and ex post statistical analysis tools for temporal regional analysis as well as longitudinal panel studies of the expectations and behaviour of regional actors. The project started in 1999 and continues at least until 2003.

Funding:Skr

2000	2001	2002	2003	2004
900 000	900 000	900 000	540 000	360 000

Dnr 2000-0131	Competition Conditions in the Freight Transport Sector
Project leader: Arne Jensen	Research institute: Universitetet i Göteborg Företagsekonomiska institutionen Handelshögskolan Box 610 405 30 GÖTEBORG
Abstract:	Application of the general theory of competition in the freight transport sector often leads to problems of interpretability and also, in certain cases, to doubt about the relevance of the theory. This empirical study carries, through a structured analysis of market structures, competitive forces, and competitive interfaces. The aim is to establish a structure of empirical data and, on this platform, to develop concepts and models which can be used for a more successful application of the theory of competition on freight transport.

Funding:Skr

2000	2001
23 031	572 104

Dnr 2000-0196	The Development of Regional Logistics Centres
Project leader: Arne Jensen	Research institute: Universitetet i Göteborg Företagsekonomiska institutionen Handelshögskolan Box 610 405 30 GÖTEBORG
Abstract:	This project deals with the development of regional logistics centres, a subject which has noticed a growing interest recently. The term regional logistics centres refers to places offering logistics users, manufacturers as well as distributors, excellent sites between sources of supply and their customers and a wide assortment of infrastructure, fixed facilities, logistics services and public services. In a logistics centre, the establishers can choose between making investments of their own or buying logistics services from third party providers. This project studies logistics users criteria when choosing logistics centres, how logistics centres can be managed and develop their offer into competitive bundles of services and also how centres can adapt their offer to specific segments of logistics users.

Funding:Skr

2001	2002	2003
750 941	834 051	288 749

Dnr 2000-0493	Market-Adjusted production and organisation of International Rail Transport between Sweden - Central Europe and Spain
Project leader: Bo-Lennart Nelldal	Research institute: Kungliga Tekniska Högskolan Järnvägsgruppen 100 44 STOCKHOLM
Abstract:	The aim of the study is to describe how the future rail freight transportation system can be designed depending on the technical development potential of the railway, the market and the customers emend and preferences. In this project selected international transports will be examined where the competitiveness of rail-freight may be improved by better organisation or transportation technique. As an interesting market has Sweden-Central Europe-Spain been identified.

Funding:Skr

2001	2002
250 000	350 000

Dnr 2000-0565	Innovative Railway Technology
Project leader: Johan Förstberg	Research institute: Statens Väg- och Transportforskningsinst 581 95 LINKÖPING
Abstract:	The research theme "Innovative Railway Technology" is a continuation and enlargement, based on the research project SAMBA 4 and 5 at KTH. These two projects will be finished under 2000 with two PhD. With the other proposed projects, this theme will be multi-disciplinary with economics behavioural studies, human-machine interface, etc. The theme will be divided into five project: Track/vehicle interaction (TRAVEL), Innovative tilt technology (ITIL), Integrated man/machine interaction (IMMI) Innovative train management systems (TMS) and Railway Innovation and Implementation Processes (RIIP). These five projects will be divided into subprojects. Some of the subprojects are proposed as doctoral.

Funding:Skr

2001	2002	2003	2004	2005	2006
200 000	600 000	1 700 000	1 700 000	1 500 000	1 200 000

Dnr 2000-0622	Management of public transport services - A research programme management of contracts, marketing and competence
Project leader: Bo Edvardsson	Research institute: Universitetet i Karlstad Centrum för tjänsteforskning CTF 651 88 KARLSTAD
Abstract:	In the research programme management of public transport services are studied. Within four different themes 10 subprojects are described

	in a separate research plan: Contract management, Service information, Marketing, Development of competence
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Funding:Skr

2001	2002	2003	2004	2005	2006
265 000	500 000	600 000	600 000	523 000	277 000

Dnr 2000-0730	The development of an efficient and user friendly methodology for planning and assessment of local and regional public transport
Project leader: Bo Östlund	Research institute: TFK - Institutet för transportforskning 112 93 STOCKHOLM
Abstract:	<p>The project aims at the development of an efficient and user-friendly methodology for planning and assessment of local and regional public transport. This will be accomplished through the integration of a system for production management based on data from modern ticketing systems, with demand models derived from the newly developed national transport planning system SAMPERS and with an advanced tool for network analysis. The result will be a comprehensive integrated methodology for market analysis and assessment of public transport operation and planning suited for regional transport authorities and traffic operators.</p> <p>The methodology will be demonstrated in three case studies in co-operation with transport authorities.</p>

Funding:

2001	2002	2003
93 880	1 298 855	312 285
