Helsinki University of Technology
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Publication 93

Proceedings of the French-Finnish Symposium on Urban Traffic

November 14-15, 1996
Helsinki University of Technology
Espoo, Finland

Department of Civil and Environmental Engineering
Laboratory of Transportation Engineering

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FOREWORD

In November 14-15, 1996, a French-Finnish Symposium on Urban Traffic was arranged at the Helsinki University of Technology, Finland. The subjects in the first day of the symposium were "Transport telematics", "Financing and organization of urban public transport" and "Crossing the borders in transport infrastructure". The themes of the second meeting day were "Urban transport" and "Alternative ways of highway financing".

The presentations were given by the Finnish and French experts. Also representatives of the cities of St. Petersburg and Tallinn were heard. The official language of the symposium was English. This publication contains the proceedings of the symposium.

I am grateful to all the organisators and supporters, who made this symposium possible. As a chairman I would like to thank the organising committee, which consisted of Gösta Diehl, Ilkka Hovi, Petri Jalasto, Pekka Rytilä and Nora Kalso as a secretary.

The patron of the symposium was His Excellency, the Ambassador of France in Finland Alain Briottet.

Otaniemi, December 16, 1997

Matti Pursula
Professor

French-Finnish Symposium on Urban Traffic
November 14-15, 1996
Helsinki University of Technology
Otakaari 1, Espoo, Auditorium E

CONTENTS

French-Finnish Symposium on Urban Traffic
November 14-15, 1996
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Otakaari 1, Espoo, Auditorium E

PROGRAMME

Thursday, 14 November

9.00-12.00 Registration

Opening Ceremony:
Alain Briottet, Ambassador of France
Harri Cavén – Ministry of Transport and Communications

Transport telematics
Chairman prof. Matti Pursula

Transport telematics in Finland
Risto Kulmala – Finnish National Road Administration

Smart card – case study
Pertti Heinonen – Turku Public Transport Authority

Coffee

Transport telematics in France – general presentation and case study
Thierry Véxiau – Direction de la Sécurite et de la Circulation Routières – MELTT

12.00 Lunch

13.30-17.00

Financing and organization of urban public transport
Chairman Maurice Abeille

Tendering in urban public transport
Tero Anttila – LT-Consults

Financing and institutional organization of urban public transport in France
Maurice Abeille – Centre d'Etudes sur les Réseaux, les Transports, l'Urbanisme et les Constructions Publiques (CERTU)

Coffee

Crossing the borders in transport infrastructure
Chairman Pekka Rytilä

International infrastructure projects around the Gulf of Finland area
Finland: *Pekka Rytilä – LS-Service Oy*
Estonia: *Alexander Kaldas – Estonian Road Administration*
Russia: *Mihail Piir – Transport Academy of Russia, Building & Architecture Committee of St. Petersburg*

French experiences of cross border transport cooperation
Dominique Ritz, Direction Régionale de l'Equipment d'Alsace

18.00 Welcome party at Karhusaari – City of Espoo

Friday, 15 November

Urban transport
Chairman Maurice Abeille

9.00 Departure from the University of Technology by bus to Pasila

Visit to the traffic management center of the Finnish National Road Administration

Telematics in Urban transport corridors
Pekka Kontiala – Finnish National Road Administration

Coffee and return to Otaniemi

11.00 Urban transport in France: case study
Maurice Abeille – Centre d'Etudes sur les Réseaux, les Transports, l'Urbanisme et les Constructions Publiques (CERTU)

12.00 Lunch

13.30-16.00 **Alternative ways of highway financing**
Chairman Matti Pursula

D.B.F.O. in Järvenpää-Lahti motorway
Juhani Tervala – Ministry of Transport and Communications

French Experiences in financing construction and operation of toll roads
Alain Fayard – Direction des Routes

Conclusion
Matti Pursula – Helsinki University of Technology

French-Finnish Symposium on Urban Traffic
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French-Finnish Symposium on Urban Traffic
November 14-15, 1996
Helsinki University of Technology
Otakaari 1, Espoo, Auditorium E

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French-Finnish Symposium on Urban Traffic
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Discours d'ouverture de Son Excellence Monsieur Alain Briottet, l'Ambassadeur de France en Finlande

Monsieur l'Inspecteur, Messieurs les Directeurs, Messieurs, Chers amis,

C'est une évidence historique et géographique que de reconnaître la position de carrefour des communications occupée au centre de l'Europe par la France et au nord du continent par la Finlande. Ces deux pays ont été en effet, au cours des siècles des points de passage obligé entre l'est et l'ouest, le nord et le sud, les aménant ainsi à jouer un rôle stratégique dans les communications européennes tant terrestres que maritimes.

Ce qui était vrai au Moyen Age ou à l'époque de la ligue Hanséatique l'est encore davatage aujourd'hui, tant les échanges se sont intensifiés dans les dernières années entre la Finlande et ses voisins, mais également avec le reste de l'Europe depuis la rentrée de ce pays dans l'Union Européenne au 1/1/1995.

Aussi me semble-t-il particulièrement bienvenu et - je l'espère - fructueux, de mettre en commun notre expertise et nos expériences dans le secteur du transport urbain et interurbain dans nos deux pays, car même dans le nouveau contexte multilatéral européen où se développent ces divers modes de communication, il est indispensable de construire des partenariats bilatéraux forts qui s'appuient sur un partage des connaissances dans les domaines d'excellence de la France et de la Finlande.

Ainsi, en tant que représentant officiel de la France dans ce pays suis-je particulièrement heureux de souhaiter la bienvenue à vos invités français, précisément parce que je suis convaincu qu'ils représentent, chacun dans sa spécialité, un savoir-faire français dont je souhaite que puissent profiter nos partenaires finlandais: je songe en particulier à la télématique des transports où la France a joué un rôle de pionnier avec l'utilisation de la carte à puce, mais également aux autoroutes à péage puisque ce système et presque omniprésent dans l'hexagone et je songe enfin aux communications transfrontalières, qui font partie de l'expérience quotidienne de notre pays, tant ses voisins limitrophes sont nombreux. Nul doute donc que pour toutes ces formes de transports, tout comme pour le trafic urbain, nos spécialistes français - dont je salue ici à la fois le haut niveau et la diversité de compétence - n'aient beaucoup à faire partager à leurs interlocuteurs qui viennent non seulement de Finlande mais également de pays voisins comme la Russie et l'Estonie.

Si donc il est question dans ce colloque de transport et de communication, il n'est pas moins évident que ce sont également les hommes

qui vont communiquer, les idées qui vont circuler et les expériences qui vont être échangées et - je l'espère - "transportées".

A ce point de vue, je tiens à remercier les différents organisateurs de ce colloque l'Association de la Planification du Trafic, l'Association finlandaise du transport public, l'Université de Technologie d'Helsinki et à exprimer en particulier ma reconnaissance l'Association Franco-Finlandaise pour la Recherche Scientifique et Technique dont les efforts et les objectifs oeuvrent depuis plus de 20 ans à l'organisation de colloques scientfiques de haut niveau entre la France et la Finlande.

En vous remerciant tous encore pour votre participation active à ce projet, je vous souhaite un excellent travail dans ce colloque franco-finlandais sur les transports que je déclare officiellement ouvert, au nom de l'Ambassadeur de France en Finlande.

PS. Puisque c'est de transport et de communication qu'il va s'agir dans vos travaux, nous avons accepté qu'ils se déroulent en anglais, à cause de son statut de langue "véhiculaire", de communication justement, mais ne doutant pas que dans un avenir proche les compétences linguistiques de nos partenaires finlandais nous permettront de communiquer dans l'autre langue reconnue pour son universalité: le français

Translation of the opening speech of His Excellency, the Ambassador of France in Finland, Alain Briottet

Honoured Head of department, honoured directors, ladies and gentlemen, dear friends,

From the historical and geographical aspect it is obvious to admit that France is a junction of transport in Central Europe and that Finland has the similar position in Northern Europe. These two countries have through centuries been passages between east and west as well as north and south and have therefore got strategic role in European maritime and ground communications.

That what counted in the medieval times or at the times of Hansa trade, counts even more clearly nowadays as communications between Finland and its neighbours have become more intensive. In addition, since Finland joined European Union the connections with other European countries have become closer than ever. I think it is especially welcome and hopefully fruitful to combine the expertise and experience of our countries in urban and interurban transport because in today's Europe, where multilateral connections are bound and different communication methods are developed it is important to build strong bilateral relations, which base on sharing the knowledge in different areas of know-how in each country, in this case Finland and France.

So as an official representative of France in this country I am pleased to welcome French guests, for I believe they all represent the know-how of their profession that can benefit our Finnish cooperation partners. In particular I think about transport telematics, where France has been the pioneer at the utilisation of smart cards. Besides this our national road pricing measures occur to my mind. The daily experience has been gained also in border crossing transport, for our country has several neighbours. Without any doubt, our country provides experts in all these transport modes as well as urban transport and I appreciate their high competence and diversity. They sure have a lot to present to the participants from Finland as well as from the neighbour countries Russia and Estonia.

Even if this colloquim concerns transport and communications it is clear that in particular people communicate, thoughts move and experiences hopefully exchange.

I would like to thank for the organisators of the colloquim, Finnish Public Transport Association, Association of Traffic Planning, Helsinki University of Technology and especially French-Finnish Association of Science and Technology, that has already worked twenty years in arranging high standard science colloquims between Finland and France.

I thank every one for active participation in this project and wish you enthusiasm in French-Finnish transport colloquim, which I, in the name of the Ambassador of France in Finland, herewith declare open.

MINISTRY OF TRANSPORT AND COMMUNICATIONS
Road Transport Department
Head of Department Harri Cavén

November 14, 1996

FRENCH-FINNISH SYMPOSIUM ON URBAN TRAFFIC,
November 14-15, 1996, Helsinki University of Technology

Ladies and gentlemen,

I am pleased to welcome you, on behalf of the Ministry of Transport and Communications, to this Transport Symposium. In terms of the population size, Finland and France are very different. However, though the average population density for the whole country is much greater in France than in Finland, there are regions in France which, in respect of population density, correspond to southern Finland. In the field of transport, part of the problems and ways of operation are indeed very similar here in Finland and in France and there are things that can be learned from each other and developed in cooperation. A case in point is, for instance, EU research in the field of transport. Many of those projects involve consortiums with both Finnish and French partners. Of the items on the programme for today and tomorrow my department in the Ministry of Transport and Communications wrestles with transport telematics, financing and administration of public transport, and city transport. Moreover, in the context of cooperation in the neighbouring areas our work covers transport to and from Russia. To our regret it focuses on problems related to goods transport by road at the boarder or on the Russian side.

Transport telematics is a subject of keen interest both in the EU and worldwide. It is believed that telematics applications will make it possible to curb traffic problems, strengthen competitiveness and even improve traffic flow. In France there are congested areas where telematics applications are deployed to overcome problems. In Finland the starting point in various areas is almost the opposite: problems caused by sparse population and insignificant traffic are being solved through telematics.

Almost all the transport telematics projects are based on positioning. In Finland, the key development sectors in the transport telematics are geographical information systems and, in particular, their deployment. In our view, interesting projects include payment systems for

public transport. Accordingly, we have targeted our major investments in their advancement. Other significant projects are information systems and demand responsive systems for public transport, by means of which services can be enhanced and costs reduced. One of the top priority projects in road traffic is the development of the road weather service. We intend to elaborate the service so that speed recommendations can be given and variable message signs controlled by using the system. Fortunately, congestion management systems do not play a very important role in this country and they are limited to a very small area.

As regards goods transport, we are interested in all projects which, through enhanced data transfer and data processing, seek to maximise transport efficiency and facilitate transfers from one mode of transport to another. About 85 per cent of Finland's foreign trade is carried by sea and a great part changes mode of transport at least once along the way. In respect of foreign trade, in particular, distances for goods transport operations are very long compared with many of our west European competitors. Consequently, logistics costs in our country are high compared with costs in those countries. Other reasons for our high logistics costs are sparse population and mass production intensive industry. Telematics will help to outweigh the disadvantage caused by long distances for competitiveness of our trade and industry.

In Finland, the market share of public passenger transport is large in international comparisons. However, its share is slowly diminishing. The society will be facing many problems, if the significance of public transport will decline substantially. Mass transport must serve all groups of population, such as working people, school children and special groups like elderly and disabled people. Upholding public passenger transport calls for financial support by the State and the local government. The turnover of public transport is 8.5 billion Finnish marks, of which the State financing is 1.7 billion and that of local government 2.4 billion Finnish marks. However, this alone is not enough. Public passenger transport has to be built up - starting from the needs of the customers - into a transport system where the different transport modes complement each other to form a smooth network. This idea is included in the European Commission Green Paper "The Citizens' Network". Only an integrated network can bring about a sufficiently high service level so that transport services can offer a real alternative to the private car.

In Finland we do not want to confront private cars and public passenger transport. Therefore, for instance feeder transport and park-and-ride systems are being developed. The same applies to cycling and its significance is increasing. In Finland air transport and taxis also have some

features of public transport. Public passenger transport, private cars and cycling must form a functioning whole adapted to the circumstances in this country.

Finland's position has changed essentially as a result of political and economic changes in Europe. The progressive transfer of Russia to market economy, the recovery of independence in the Baltic States, the accession of Finland to the EU as well as the EU's eastern policy and its Association Agreements have changed Finland's position and operating conditions. The changes in the areas neighbouring Finland have essentially shaped Finland's position with regard to traffic as well. Finland is now situated in the middle of what can be called new Northern Europe with some 60 million people in its sphere of influence.

It is in the interest of Finland to endeavour fully to utilise its new position geopolitically and in terms of economic geography. The transport sector occupies a key position in building up a Gateway position. In this field the cooperation strategy for the neighbouring areas aims to attain the general objective. The utilisation can succeed only if Russia and the Baltic States find that they can derive real benefit from the activity. The transport cooperation in the neighbouring areas is part of the Finnish and EU transport policy. The target is to improve conditions for trade, tourism and other cooperation by improving transport infrastructure in the neighbouring areas. Functioning land transport connections have to be created for the opening markets.

The Finns have participated very little in financing concrete transport projects in Russia or in the Baltic States. This practice may need to be reconsidered. The VR Group Ltd. is considering participation in the completion work of the rail connection Lietmajärvi - Kotshkoma in Russia. The project would shorten the distance for goods transport to the ports in the northern part of the Gulf of Bothnia by 500 kilometres. Another target requiring financing is part of the Helsinki - St. Petersburg - Moscow route. On the Russian side there is an urgent need to get the construction of the Vyborg bypass under way. The bridges on the present route have already difficulties in bearing current goods volumes. If the traffic volumes increase as forecasted, the traffic may have to be stopped completely due to overloading of bridges.

New alternatives for financing traffic projects were surveyed in Finland a few years ago. The surveys indicated that it is not economically efficient to establish private or other companies with the task of building and maintaining motorways for which motorway tolls would be collected. The traffic volumes in Finland are not sufficient to permit these projects to be

economically viable. In Finland, the most useful model seems to be the 'shadow toll' model. It will be experimented with on primary road 4, when upgrading the motor traffic road stretch Järvenpää - Joutjärvi into a motorway. A private road company will plan and build the road, and be responsible for its maintenance. The company will also take care of the financing during a contract period of at least 15 years. The State will pay a compensation to the company afterwards. Thus the undertaking will bear a substantial part of the risks in the project. The State will not guarantee the project. In the metropolitan area proposals and studies have been made on the use road toll systems for financing new traffic projects. The idea was to collect ear-marked money for traffic projects in the metropolitan area. The project has been abandoned for the time being and I think that its realization is not very probable in the near future.

TRANSPORT TELEMATICS IN FINLAND

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1 INTRODUCTION

This paper attempts to describe the current state of transport telematics in Finland, and especially in the Finnish National Road Administration (Finnra). In Finnra, we regard transport telematics as a potential solution for our country's transport-related problems. The long distances within the country and to the central Europe, large sparsely populated areas, the gateway position between EU and Russia, and the northern location of the country are among the factors behind the problem areas in Finnish transport. The problem areas are:

- transport during the long winter season
- road safety
- local, temporary capacity problems in urban areas and summer weekends
- problems caused by slow heavy vehicles on rural two-lane roads
- environmental problems (ground water; air quality in Helsinki)
- high transport costs
- need to improve the economic efficiency of public transport
- level of service of public transport
- challenges in fulfilling the increasing information needs of the travellers

The long winter season causes efficiency, safety and environmental problems. In Finland, ca. 40 % of all injury accidents occur in adverse weather conditions, mostly on wintry (icy, snowy or slushy) road surfaces. The environmental problems are largely caused by the use of salt for de-icing, but these problems have been successfully reduced by precision salting methods enabled by the efficient weather and road surface monitoring and prediction systems.

The capacity problems are frequent in the Helsinki area. In other parts of the road network, capacity problems are concentrated in summer weekends. Slow moving or heavy vehicles cause delays for cars on the narrow and curvy two-lane roads. Due to the temporary nature of the problems, it is usually not economically feasible to solve these problems by constructing more capacity in the form of motor ways.

Goods transport is faced with serious cost problems due to the small transport volumes, long distances and the necessity of employing maritime links in international transport.

Low population densities are behind the economical and efficiency problems of public transport. The percentage of public transport of all person trips has been continuously decreasing also in Finland.

The shift into the information society has given rise to increasing demand for all types of information services. This increase has been especially notable for information about transport modes and networks. In Finland, the increasing demand has been

largely due to the highly sophisticated and advanced information and telecommunications infrastructure, which fully covers most parts of the country.

The Finnish transport telematics applications have been tailored for these special conditions. Finland has primarily been building telematics platforms enabling mobile and radio or TV based services. Road side information systems such as VMS are used at critical locations.

2 AREAS OF INTEREST

The main areas of emphasis are related, on the one hand, to Finland's technological strengths and, on the other, to the Finnish transport problems and policy objectives. The main areas are:

- the increased need for information on road conditions and their dynamics, especially in wintertime
- radio and cellular network (GSM) based information services
- payment systems for public transport
- management of public transport, especially demand responsive public transport
- logistical applications, especially problems connected to combining land and waterborne transport modes
- maritime transport

Responsibility for the development and upkeep of the telematic systems and services for transport will be shared by the public sector, on the other hand, and the private sector on the other. The public sector here primarily means the Ministry of Transport and Communications and the organisations under its co-ordination. The public sector will be responsible especially for the development and construction of the transport telematics infrastructure to the extent that it concerns the administrative sector. The role of public and private sector, as well as administrative, legal and organisational issues will be examined further in the transport telematics strategy currently being formulated by the Ministry of Transport and Communications.

The development of the services will be based as much as possible on existing infrastructure and networks that meet European standards.

3 PRIORITY APPLICATIONS

In Finland, we have identified the transport telematics applications with the highest priority in road transport. We have listed these applications below.

Traffic management and control

- Advanced methods of data collection, e.g. using floating vehicles to collect traffic and road surface condition (friction) data
- For inter-urban areas: speed harmonisation and control, corridor and network control with emphasis on dealing with adverse weather and road surface conditions as well as the use of radio and cellular communications
- New methods for enforcement of traffic laws (weigh-in-motion, hazardous goods, speeding, etc.)

Travel and traffic information

- Pre-trip information services
- En-route travel information services, especially radio (RDS-TMC, DAB, etc.) and cellular based
- Weather-related information plays an important role in all services

Tolling, electronic payment and booking

- integrated ticketing system based on smart cards
- multimodal public transport electronic payment and access control

Freight and fleet management

- electronic data interchange between all partners in the logistic chain
- digital road and street maps combined with the general geographical information for route planning and vehicle navigation
- vehicle location technologies for fleet management purposes and to trace unit loads
- common identification system for transport units as containers, swap bodies, wagons, trailers and vehicles (AVI standards)
- smart card technology for verifying the authorisation of the drivers and controlling automatically their access (driving licence or smart card for electronic tachograph)
- electronic monitoring and control system for transport of hazardous goods - automatic alarming in case of accident
- mobile data communication links between the driver or vehicle and dispatch centre using terrestrial and satellite networks. The mobile data system is already nationwide.

Collective transport services

- integrated fare collection system using smart cards
- real-time information services at bus stops
- priority at traffic signals for collective transport vehicles as part of urban traffic control system

Advanced vehicle safety

- Dynamic speed adaptation and control systems

4 THE FINNISH TELEMATICS TEST AREA

Finnra is currently implementing the 350 km long E18 corridor through the south of Finland from Turku to the Russian border as a test site for telematic applications. The existing infrastructure and the varying climatic conditions form an especially suitable platform for weather related traffic management and information systems as well as mobile telematic services. Transport Telematics - E18 Test Area can be regarded as a prototype of a Finnish traffic management system that makes use of transport telematics (see Figure 1).

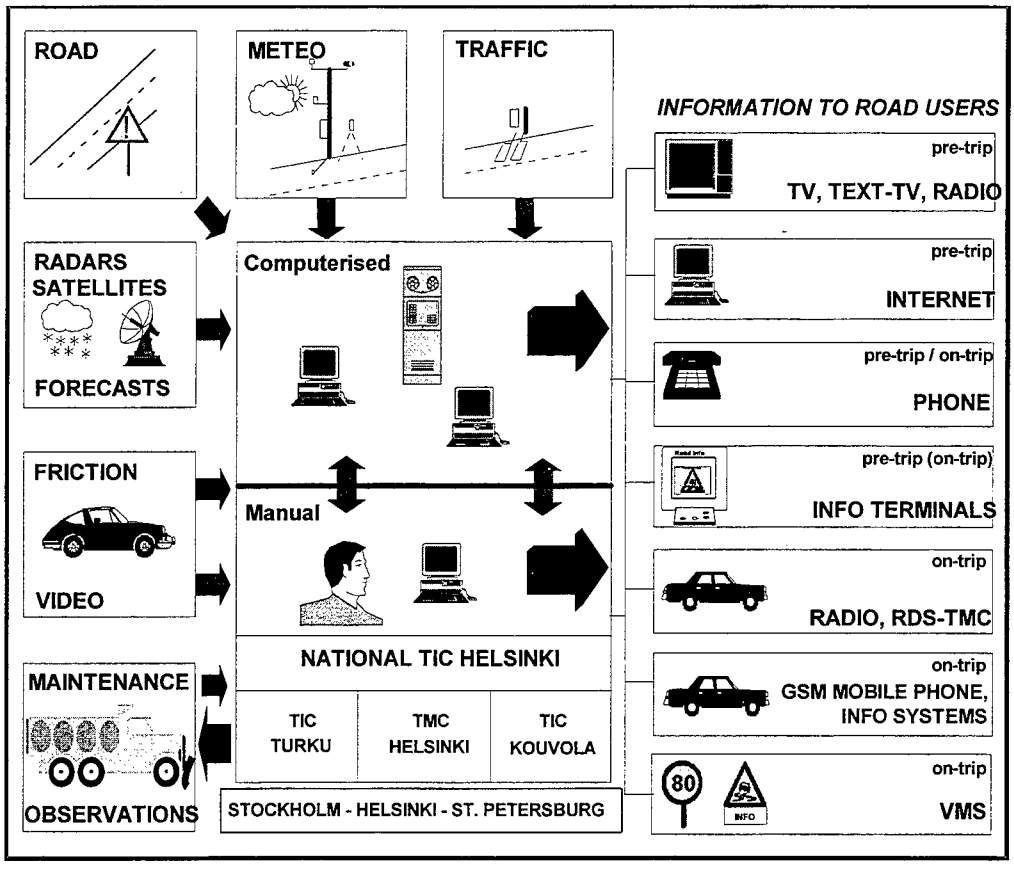

Figure 1. Transport Telematics - E18 Test Area

In data collection, the traffic management systems make use of Finnra's road weather service system with its 206 outstations, 20 road conditions monitoring CCTV cameras

and satellite and radar pictures from the Finnish Meteorological Institute. Traffic conditions are currently monitored with the help of 200 automatic traffic counting stations. In 1997, some CCTV cameras will be brought into use, as well as a dense traffic monitoring network based on inductive loops in Helsinki area. A test on floating vehicles that collect traffic and road surface condition (friction) data will be initiated in late 1996. New methods of data transmission from the outstations to the central system will be tested.

The national traffic information centre (TIC) in Helsinki has been in operation since 1993. Furthermore, there are nine regional TICs in Finland, three of them in the E18 area, in charge of both maintenance management and traveller information. The centre of Uusimaa Region (the greater Helsinki Area) is actually a traffic management centre (TMC) as it also controls traffic signals and other traffic control equipment of its own district. Today's challenge is to integrate and develop the various databases that are essential for effective real-time traffic management.

Travel and traffic information include both pre-trip and on-trip information, and the R&D focuses especially on radio (RDS-TMC etc.) and cellular based services. RDS-TMC will be taken in test-use in late 1996. Internet, Teletext and automatic telephone services are already widely used. At high-level motor way service areas, Finnra has chosen to serve its clients through service terminals, "Traveller's points of information". Weather-related information plays an important role in all services.

Traffic control applications for inter-urban areas include speed harmonisation and control, as well as corridor and network control with emphasis on dealing with adverse weather and road surface conditions. Variable speed limits will be further tested on both motor ways and two-lane roads. Variable message signs that warn for poor road conditions have been chosen to be used at some critical parts of the road network.

5 STRATEGY FOR TRANSPORT TELEMATICS

The transport telematics strategy for the Finnish National Road Administration is based on the vision of the future transport system. This vision reflects the state, which transport policy is aiming for in Finland, or the goal state. The Finnish Ministry of Transport and Communications is currently producing this vision for the year 2020, and has already published a report describing the state of the transport infrastructure in 2010. For our purposes, it is essential that the transport and other policy makers would determine their vision of the role of transport telematics in the future transport system and society.

When we know the goal states of the transport system and telematics, we can plan the strategic path or paths, which lead from the current state to the goal state (see Figure 2).

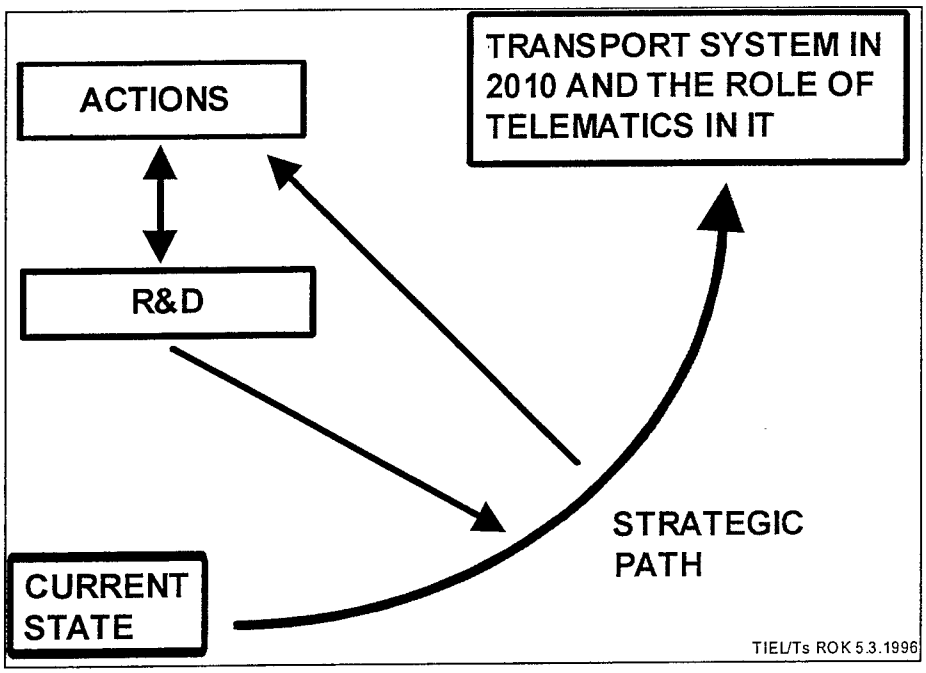

Figure 2. Determining the strategy for transport telematics

The strategy for transport telematics is closely linked to the other strategies of the Ministry and Finnra (e.g. transport infrastructure, information society, traffic safety). The link is especially clear to the overall transport telematics strategy, covering the whole transport system i.e. all modes of transport. This strategy is currently being formulated by the Ministry of Transport and Communications (MTC) in order to manage the planning and implementation of telematic networks, services and research activities of the area. The main points of the strategy are:

- Transport telematics will be based on the needs and acceptance of the users
- The development of telematic systems and services shall be steered towards areas identified as being important for the achievement of the objectives of the common transport and industrial policies
- Telematic systems and services are compatible with European systems
- Systems developed and applied in Finland shall adhere as closely as possible to an open architecture with regard to both technology and transport mode
- The creation of a telematic infrastructure that will allow European industry to produce and develop competitive products and services for the transport sector
- Active participation in European research and development work with the objectives of improving expertise and developing competitive products
- Participation in standardisation work that furthers the cause and interests of transport telematics so that systems developed and applied would, to the extent necessary, be compatible and interoperable with European systems

- The development of telematic systems and services through experiments, so that the effects of the systems on transport and society as well as user-acceptance and user-benefits can be evaluated

The strategic path (or paths) consists of actions and action programmes, which will be determined in the next phase. The implementation of and decision making on these actions require new knowledge and information. Hence, we need specific research and development activities to provide this knowledge and information in order to choose the appropriate actions. The actions are also based on Finnra's general principles and guidelines on the use of transport telematics.

The research and development activities also monitor our progress along the strategic path and thus assist us in altering our course when necessary. The strategy is not a rigid one but rather a process, the contents of which must be regularly adapted to he changes in the goal states and the operating environment.

So far, we have determined the five main points of our strategy for transport telematics. These points are:

1. Transport telematics is used for the purpose of fulfilling the objectives on transport efficiency, safety and environment specifically set to Finnra, and for the integration of the whole multimodal transport system.

2. The development and use of transport telematics applications is based on the requirements and acceptance of the users of the applications (road users, road authorities, transport operators, etc.)

3. Transport telematics is implemented in a controlled manner by carefully investigating the impacts and feasibility of each application through pilot studies and demonstrations before their wider implementation. Applications, which these studies prove to be sufficiently advantageous, can then implemented as part of Finnra's routine actions when appropriate.

4. Transport telematics applications are implemented in a consistent and similar manner throughout the country, following the standards and guidelines agreed upon in Finnra as well as in the European Union.

5. Finnra can provide access to its transport related information systems also to other actors producing transport telematics services for travellers and transport operators, if these services support the fulfilment of Finnra´s objectives regarding the transport system.

6 CONCLUSIONS

Telematics is often regarded as a new area in transport. This is hot, however, the case as it has been widely used in the form of e.g. signal control in junctions. The recent enormous advances in telecommunications and information technology have only now made it possible for us to apply telematics widely in the area of transport. Progress and development have so far often been led by the technology developers, who have identified promising new markets in the area of transport. During the last few years, the public sector has acknowledged the importance and potential of telematics as a tool to be used to solve the efficiency, safety and environmental problems related to transport and its all modes. Telematics is widely seen as the main ingredient in the development of a multimodal transport system, where all transport modes function in an optimal and integrated manner.

All countries have their own specific areas of interest also in the field of transport. These areas are linked to the properties of the country (geographic and political location, climate, land use patterns, economy, standard of living, etc.), the strengths of its industry and the main transport-related problems as perceived by the people and decision-makers. Transport telematics actions are naturally also specific in each country and undertaken in line with the national areas of interest.

The European perspective is, however, increasing in importance. The quality of life in European cities, towns and villages is dependent on the safe and efficient operation of the European transport system. Telematics systems in transport should also pave the way for an integrated multimodal European transport system. This can be best achieved by developing the telematics applications and systems together in the different European fora as well as in co-operation between countries with similar interests.

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FUTURE INTELLIGENCE WITHIN PUBLIC TRANSPORT

1 Objectives

Firstly, a few words about the history and the objectives of the new payment system:
Turku's board of public transport
- the organ that is responsible for organising public transport in the town -
set itself the task of creating a travel ticket system which is flexible, easy to use and secure.

The public transport office
- responsible for implementing this project -
set its own additional targets such as
- on-line access to the state of ticket sales and
- a better data base for planning public transport.

A better data base means
- accurate statistics on travellers with any kind of ticket
- accurate statistics on each bus route and
- each departure.

Let me give an example to illustrate how a better data base benefits us in winning new travellers and to balance the load during the peak hours. In Turku we have had for a number of years a pricing policy whereby adults can travel from Monday to Friday between 10.00 and 14.00 for the same price as a child.

Along the new payment system and accurate statistics we will be able to find new possibilities to extend this kind of time or target tailored pricing policies for other types of ticket.

Another important objective was to build a commonly accepted and reliable clearing system for the regional extensions of the public transport. This is needed for fair sharing of the costs between various bus companies and other parties. Now, thanks to the smart card and the new intelligent payment system there's also a good chance of succeeding with these regional projects.

2 Purchasers and suppliers

There are three parties jointly purchasing the new payment system for Turku's local transport. These are:

- **Turku's board of transport**
- **Turun liikennelaitos**, that is the bus company owned by the Turku municipality
- **Turun linja-autoilijain Osakeyhtiö**, the joint venture company of the private bus companies

The main contract was signed with **Nokia Cellular Systems**. The sub-contractors were **Buscom Oy** from Oulu, the supplier of the payment devices, IC card reader devices and the cards, and **Western Systems Oy** from Helsinki, the supplier of the data transfer and clearing programs.

During the work, the overall responsibility was, for practical reasons transferred to Buscom Oy. The responsibility for the warranty remained with Nokia.

The overall value of the contract was about 7.1 million FIM. The ministry of transport has granted 2.7 million FIM in state assistance.

3 The advantages of the IC card

Turku has chosen the IC card with 1 kilobit of memory developed by Buscom. On what grounds was the choice made?

Because this product meets all our criteria. It's easy to use, quick and suitable for the special demands of city transport.

Before the decision was made we went into it quite carefully. In December 1991 an IC card trial was started in a number of buses. This trial was the first time the IC card was used in public transport.

In addition, we have carefully followed up developments in card technology both here in Finland and abroad. One of those cases has been that of the Tampere travel card.

4 The new bus cards

The first bus cards were ready at the end of 95. At the same time the testing of the cards started firstly in an office environment and later by our personnel on the buses.

The first series of 50,000 cards was produced in France. The design of the cards is of a high quality. The printing work has been done straight onto the surface of the cards. The pictures present the beauty of our town.

The next series of cards was produced by the Finnish printing house.

5 Value cards and period (seasonal) cards

There are three main types of card. To tell them apart, each type of card has it's own picture.

The types of card are as follows:

- Value card.
  This card will largely replace the former 10 trip serial card.

- Period card.
  This is a fixed term card. The period of validity is calculated from the first time it is used.
  It allows the user an unlimited number of trips during its period of validity.

6 Special cards and other tickets

- Special card.
  These include direct debit seasonal cards, cards of a longer duration, and special free cards.

Also single tickets as well as 24-hour-tickets can be given by the electronic ticket machine.

The idea is to develop the travel ticket to a multi-functional smart card. This can be used to pay for both bus travel and other travel services.

7 Zone reader device

On the card reader there are 6 zone buttons which means that the system can be adapted for regional transport. The holder of the value card and the regional traveller register their trip using a zone button.

For paying for trips within the common tariff area - that means Turku municipality - there is a special button marked with the common tariff sign.

For travel outside the common tariff zone, the traveller uses the other zone buttons.

8 Smart card charges

The change to the new system will only have a minor effect on the ticket prices.

The basic price is the price of an adult single ticket. The other ticket prices are calculated from this basic ticket price. On the single ticket and value card there is an additional midday and night time charge.

We don't charge a night-time fee for period card owners.

In addition to the original period on the card, extra days can be added at the day-time price. This can be done on the bus. There is a minimum charge which in the case of adults is 100 FIM and for children 50 FIM.

Turku municipality no longer sells separate tickets for school children. The exception are the legally entitled free school trips, loaded in the value card.

We charge 30 FIM for the IC cards. - In the case where a passenger gives up using the buses, he can return the card and receive 30 Marks back as a refund.

9 Points of sale for tickets and card reloading points

The traditional point of sale for tickets is the local transport service office located by the market place, that is an important terminal for local transport and a place where you transfer to regional buses.

Apart from this point of sale, there are 2 other ticket offices in the centre. In these offices the passenger can

- obtain a card,
- get a refund and
- get the first loading of the card.

The following reloadings can be done on the common tariff buses. You can use a direct debit card as a means of payment.

In addition Turku's electronic card readers have an option for contact cards for future applications.

Turku's smart cards were brought in step by step. In order to minimize the risks we first launched (the 1 st of april) the Special cards as this user group is the smallest. Secondly came the Period cards and at about the same time the Special priced cards for those students, that are Turku citizens.

At present all card types are in use when also the Value cards were launched in October.

10 Examples of Turku public transport information material

Informing people was a large part of the introduction of the new cards.

We have informed travellers through the local radio broadcasters and newspapers and also through a variety of inserts in our own magazine "**Bussi on OK**".

In addition we have carefully tried to find out the wishes of travellers by conducting a 3 stage survey.

In the first stage we focussed on the travellers' expectations of the new payment system. The results of the first phase of survey are now available and very promising. The information had reached the main target group - the bus passengers, so well, that **99 %** of the bus users knew about the new system.

In addition Turku's common tariff transport's personnel is highly motivated to use the smart card and the new payment system.

Although it sounds as if we have had few problems during this process, it must be said, that we did have some minor difficulties on the way, eg the program designer forgot the fact that some children in Finland start school at 6 years old - though they are usually 7. The mistake was noticed so late that we did not have time to test the new program properly, so as a result of the speedy implantation of the new program we had numerous errors in the data system that caused harm to our youngest clients.

Now we have solved the problems and are already enjoying the benefits offered by the new system.

We are also happy to draw the conclusion that the objectives set by the board of public transport have, up until now, been achieved.

sécurité routière

Ministère de l'Equipement, du Logement,
des Transports et du Tourisme

■

Direction de la Sécurité
et de la Circulation Routières

■

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III

French policy of implementation of road telematics systems

Warning:
This document is currently a working document summarising decisions today effectively taken by the Ministry, nevertheless, it has not yet been approved in this form and can be still subject of modifications until its official publication at the end of 1996.

The French Ministry of Transports has implemented since more of twenty years co-ordinate actions of traffic management and road information. From the beginning, these actions used all the most convenient technologies, including telematics. After a new stage of experimentation during the "PREDIT" (French R&D program) and 2th and 3th FP of European Union, the Ministry of Transports decided to implement a co-ordinate program of intelligent transport systems in the road area (road telematics). Many realisations are today decided and planned as part of the French Road Management Master Plan (SDER). These decisions have been taken in a concerted way by all the concerned authorities (State, Regions, counties, cities, motorway companies) and are, for most of them, included in the French "XIth Plan".

Others developments are the subject of complementary studies, particularly as part of PREDIT-2 and 4th FP of the European Union.

This co-ordinate program complies with the decision of the European Union on transeuropean transport networks and with the resolution of the European Council of Ministers on road telematics deployment.

* Objectives and general implementation strategy of the road telematics

The Ministry of Transports is in charge of general transports policy aimed to insure goods and persons mobility. It has to organise an optimal use of the different transport modes, to insure their safety and efficiency while having regard to the environment. Experiments and pilot-projects led in the frame of European projects and of French PREDIT enabled to confirm the interest of road telematics to make the road network management better integrated in a global policy aiming the improvement of safety and of efficiency of transports and the reduction of the pollution. They have also enabled to stress their interest for the positioning of European and French engineering and manufacturing in the international market and for the effective valorisation of research results. Finally, they have enabled to propose an implementation strategy in four steps and organisational and technical basis of their use.

1. In a first step, each concerned authority (road, public transports) implements its own telematic systems to strengthen the safety of its network, to improve its management and to provide the users with new services. They are systems of traffic lights management (SURF 2000 to Paris), of road traffic management (SIRIUS in Ile de France), or systems to help public transport management (AIGLE) for metro, RER or fleets of busses. Others authorities are also involved in these systems : police, for safety, for security and for emergency, firemen, medical services (SAMU).

   The safety and the operation of networks don't limit today to an immediate action on the network and on its users and to on site information (panels and kiosks for public transports, dynamic signs and VMS on the road by ex.). Everywhere,

implementation of "universal services" of information (in the meaning of minimal public service for all users) has been requested in order to guarantee that authorities will control users information in case of important difficulties. Road Information centres did it since about thirty years and also big public transport operators (SNCF, RATP) by opening answering services, MINITEL services and by providing the media with information. Even if on site information is free, it is necessary to underline that this information often uses charged phone numbers (36-68 and 36-15). Motorway companies were also induced to implement dedicated radios (107.7) and a MINITEL service to insure this minimal information.

2. In a second time, organisation of the dialogue between the different public authorities is requested. First of all, within a same mode, this discussion has to induce the implementation of compatible and standardised technical solutions. They enable to organise concerted operational actions, both in big urban areas and among the big road corridors. Thus, the different authorities (State, counties, cities) have to associate to insure a coherent management of connecting networks. Similarly, the different public transport operators have to federate, operation often very difficult because of commercial competition between these operators and because of partial vision, each of them has got on the whole transport network. This standardisation enables equally costs reduction by scale effect and also to develop an industrial policy, more in favour of export.

3. The action of public authorities don't have to stop here. Indeed, these same information, whose collection is very expensive, can also be used to organise personalised services for users. These services are not directly requested by travel management policy, nevertheless they are expected by users whose they improve comfort. They are generating new jobs, without risk of unemployment since they concern new actions and products. The implementation of these added value services gathers together a large number of partners such as broadcasting operators (TDF, France-Télécom, SFR), car radio or telephone manufacturers (SAGEM, ALCATEL, CGA), car manufacturers (Renault, PSA), services operators (Lyonnaise des Eaux, Générale des Eaux). It's surely the most difficult challenge of intelligent transport systems. More, some French operators, manufacturers and consultants (including the technical network of the Ministry) are in a good place in the international competition. The State has therefore to favour private initiatives in this sector, provided of course they don't create conflict with its own objectives, and to organise the partnerships.

4. Nevertheless, it is equally necessary to continue research, notably about safety and alert, evaluation of many new products or improvement of local communication with users. More generally, some industrial developments, particularly in car area, are indirectly linked with responsibilities of authorities. It concerns particularly continuation given to PROMETHEUS projects. A continuous dialogue between manufacturers and road safety responsible persons is requested to insure an optimal development of these products. This is why the co-ordination of ITS implementation and the monitoring of corresponding research projects is needed. It complies elsewhere with recommendations made in the evaluation of PREDIT-1.

For the national road network, this deployment is defined by the Road Management Master Plan (SDER), whose a first stage will be implemented during the French "XIth Plan".

* **General deployment program**

Short term action plan

The first evaluation results of road telematics are still too vague and too unreliable in order that fully generalised applications could be considered. Especially, the knowledge of traffic difficulties or accidents typology isn't sufficiently accurate to measure contributions of telematics, except on networks with heavy traffic. So, implementation effort give the priority to these areas. Some actions have been decided and are today planned as part of the French XIth Plan.

Two priorities were selected for systems aimed to insure operation and efficiency of road networks :

- The equipment with co-ordinated management systems of urban motorways and of urban network in the biggest French agglomerations (more than 500 000 inhabitants). In this framework agglomerations of Paris, Lyon, Marseilles, Lille, Bordeaux, Toulouse, Nantes and Nancy-Metz are planned.

- The equipment of big motorways corridors. In this framework, the corridors Lille-Paris-Lyon-Marseilles-Italy-Spain and Paris-Bordeaux-Spain are planned.

These traffic management systems enable to collect information that can be used as basis for information services to the users. They will include an on site information service by Variable Messages Signs on urban and interurban motorway networks and at some access points to this network. Through the network of Road Information Centres, they will enable the implementation of a minimal public service of road information.

On the motorway network, dedicated radios will insure permanent broadcasting of safety and traffic information.

On the whole national road network, a minimal equipment will be implemented, locally strengthened to face some particular difficulties (return trip from beaches for example).

Finally, private or public operators, but in a competitive regime, will be able to have access to these collected data to develop personalised services.

Systems of automatic toll collection will be gradually harmonised and made interoperable, as well as at technical level as at functional level. Interoperability will be achieved, as part of the TIS project, the 30th of June 2000.

Studies program and in progress experiments

New developments are requested to improve the quality of the service offered to the user. They are realised as part of PREDIT-2 and of the 4th FP of the European Union, they concern notably following priorities :

- Evaluation of the socio-economic impact of the new services,
- improvement of the road safety, notably in areas of incident detection and of alert,
- multimodale pretrip information,

- integration of interurban, periurban and urban traffic management,
- Automatic toll and fees collection.

After analysis of pilot-projects results, these new products or service will be implemented in a second step during the XIIth Plan (after 2001).

European dialogue

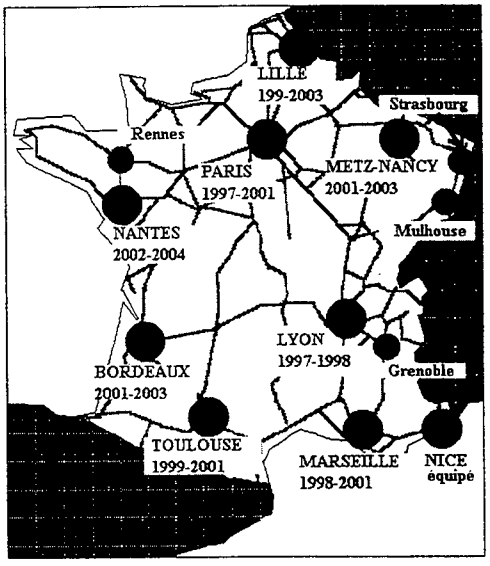
European dialogue plays a large role in French deployment policy. It includes several objectives :

- to insure methodological coherence.
  In order that French partners give a big importance to TELTEN action. This one enables them presently to describe French organisation and deployment with the same words as the other European administrations. The organisation of a TELTEN follow-up committee will enable to jointly validate these common definitions and to achieve gradually harmonised definitions of levels of service.
- to take into account European users in the national policy.
  Reference to TELTEN and to running horizontal projects (EDEN, ECORTIS) enables to study how to guarantee the European user driving on the French national network with a sufficient quality of service. It will insure our national policy to comply with paneuropean vision and to guarantee interoperability and logical continuity of service. That request generally European standard use (signalling, variable message signs, RDS-TMC broadcasting. ..).
- co-ordinated transborders actions.
  On some sites, needs of traffic management or of users information request co-ordination between traffic managers or service operators. Euroregional projects like CENTRICO or SERTI are aiming to that. They enable to co-ordinate on both sides of a border some management or information actions implemented in the framework of national policies. They enable to insure, when requested, the physical continuity of some services.

* **Traffic management in the big agglomerations**

Periurban motorways in the big agglomerations will be gradually equipped with traffic management systems. These systems will include close data collection on motorways and more limited information on the other national roads, automatic incident detection and video monitoring in most critical zones, ramp metering to motorways and information by variable message signs on the motorways and on their main entries.

They will enable 24h a day and 7 days a week real time traffic monitoring and users information on traffic conditions. They will be linked with urban traffic monitoring systems of



Aglomerations Map

local authorities and, in a further step, with public transport management systems.

On the basis of the result of Ile de France experiment, they will enable the building up of local wholesaler servers containing traffic conditions (events, travel time), but probably in a form suited for local needs.

The current program of realisation is the following:

Bordeaux (ALIENOR)	
first stage	in 2001
completion	between 2001 and 2003
Ile de France (SIRIUS)	
provisional equipment on the west part	running 97
completion	between 1999 and 2001
Lille (ALLEGRO)	
first stage	between 1999 and 2000
completion	between 2001 and 2003
Lyon (CORALY)	
completion	between 1997 and 1998
Marseilles (MARIUS)	
first stage	between 1998 and 1999
completion	between 1999 and 2001
Metz-Nancy link	
first stage	between 2001 and 2003
Nantes	
completion	between 2002 and 2004
Toulouse (ERATO)	
first stage	between 1999 and 2000
completion	between 2000 and 2001

Concerned network	Area of Paris	Area of Bordeaux	Area of Lille	Area of Lyon	Area of Marseilles	Area of Metz-Nancy	Aglomératon de Nantes	Area of Toulouse
Implementation date	199-2001	2001-2003	2001-2003	1997-1998	1999-2001	2003-2006	2002-2004	2000-2001
Network management actions								
Speed harmonisation	no	no	no	no	no	no	no	no
Rerouting	yes	yes	yes	yes	yes	yes	yes	yes
Network control	yes	yes	yes	yes	yes	yes	yes	yes
Ramp metering	yes	yes	no	yes	no	yes	yes	yes
Speed management	no	no	no	no	yes	no	no	no
Incident warning	yes	yes	yes	yes	yes	yes	yes	yes
Emergency response	yes	yes	yes	yes	yes	yes	yes	yes
Winter maintenance	no(*)	no	no(*)	no(*)	no(*)	no	no	no(*)
Lane control	in tunnels	no	no	locally	yes	no	no	no
Information actions								
Event information	yes	yes	yes	yes	yes	yes	yes	yes
Public information service	SYTADIN			radio 107.7				
Private information service	RDS-TMC Phone answering							

(*) No specific telematic equipment, but traditional management

Detailed actions (TELTEN classification)

The eight projects are financed by the State and by involved local authorities and registered in XIth Plan contracts. Their implementation is therefore fully decided.

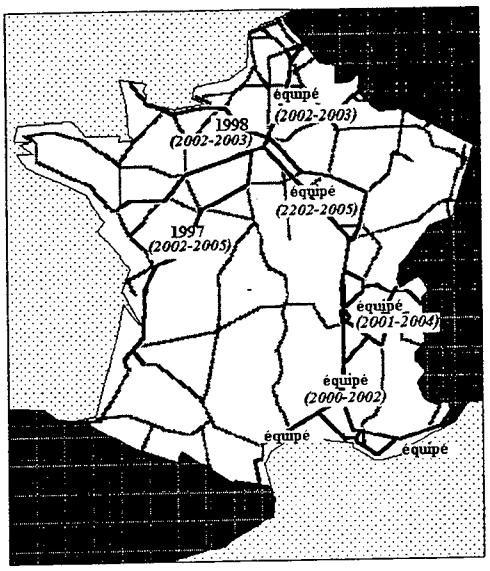
Nice agglomeration is also included as part of A8 Corridor(to see below).

For Strasbourg agglomeration, a study is in progress, but no formal implementation decision has been taken.

Ulterior implementation is considered for Grenoble, Mulhouse, Rennes.

* **Traffic management in the large corridors**

On the large motorways corridors, it is planned to equip the main motorway with traffic management and information system, with minimal traffic data collection, local equipment of incidents detection and of video monitoring, with variable message signs in the main junctions and exits. These actions are managed in dialogue between the motorway company, operating the main motorway, and local services of the State, operating parallel national roads. These ones will be also equipped to enable a minimal co-ordinated management and a minimal information on the whole corridor.



Corridors Map

Corridor A1
- main motorway equipped
- Parallel roads between 2002 and 2005

Corridor A6
- main motorway equipped
- Parallel roads between 2002 and 2005

Corridor A7
- main motorway equipped
- Parallel roads between 2000 and 2002

Corridor A8
- main motorway equipped

Corridor A9
- main motorway equipped

Corridor A10
- main motorway equipped in 1997
- Parallel roads between 2002 and 2005

Corridor A13
- main motorway equipped in 1998
- Parallel roads between 2002 and 2005

Alpine motorways
- main motorway equipped
- parallel roads between 2001 and 2004

Concerned network	Corridor A1	Corridor A6	Corridor A7	Corridor A8	Corridor A9	Corridor A10	Corridor A13	Alpine Massif
Implementation date	equipped axis parallel roads in 2002-2005	equipped axis parallel roads in 2002-2005	equipped axis parallel roads in 2000-2002	equipped axis	equipped axis	axis equipped in 1997 parallel roads in 2002-2005	axis equipped in98 parallel roads 2002-2005	equipped axis parallel roads 2001-2004
Network management actions								
Speed harmonisation	no	no	no	no	no	no	no	no
Rerouting	yes	yes	yes	yes	yes	yes	yes	yes
Network control	no	yes	yes	no	no	no	no	yes
Ramp metering	no	no	no	no	no	no	no	yes
Speed management	no	no	no	no	no	no	no	no
Incident warning	yes	yes	yes	yes	yes	yes	yes	yes
Emergency response	yes	yes	yes	yes	yes	yes	yes	yes
Winter maintenance	yes	yes	yes	yes	yes	yes	yes	yes
Lane control	no	no	no	in tunnels	no	no	no	in tunnels
Information actions								
Event information	yes	yes	yes	yes	yes	yes	yes	yes
Public information service	radio 107.77 RDS-TMC (1997)	radio 107.77	radio 107.77	radio 107.77	radio 107.77	radio 107.77 RDS-TMC (1997)	radio 107.77	radio 107.77
Private information service								

(*) No specific ielematic equipment, but traditional management

Detailed actions (TELTEN classification)

* The road information public service of CIRs

Road Information Centres (a national centre and seven regional centres) are running 24h a day and 7 days a week from many years. Their technical equipment has just been completely renovated. They have today got premises better adapted to road information development and especially one computer processing system using geographical and road information system (TIGRE).

These centres gather all road traffic information (works, meteorology, perturbations and exceptional accidents) collected by Defence, Interior and Transports Ministries. This information can then be largely distributed outside.

Today operational services are :

- a personalised telephone answering service,
- a MINITEL service,
- an AUDIOTEL service (an automated answer service),
- automatic message distribution (TELEX, Fax) to correspondents (notably radios and televisions)
- electronic distribution via one communication node, using a format near to DATEX. A version complying with DATEX standard be available in 1997.

An automatic distribution service of pictures and maps coming from TIGRE system is under development. It will be available in 1997.

* **Dedicated Motorway Radios**

The equipment of motorways with data collection and information process systems has enabled to organise systematic distribution to the users. After several experiences, deeply evaluated, it appeared that dedicated motorway radios, using isofrequency 107.7 (broadcasting with an unique frequency in 107. 7 among the whole network), are the best way to inform the users.

This system has been completed by the "local disconnection" enabling different broadcasted messages in each region.

Currently, A1, A26 (between the Eurotunnel and A1), A5, A6, A31 (between A5 and A6), A7, A8, A9, A10 until Poitiers, A71 until Bourges, A11 are the main equipped motorways.

The system will cover probably the whole toll motorways of TERN in the next five years.

* **The access to public data**

The implementation by each private operator of personalised value added service will be made possible by availability of road information public data.

For interurban networks, this function is mainly insured by CIRs.

For big agglomerations, specific actions are planned. Each road network authority will gradually implement a wholesaler server, making data accessible with standardised protocols and with regulations whose main elements will be common to all road authorities. Homogeneity of regulatory and technical specifications between the different servers entails that, for a potential service operator, all the servers will present like a unique server. A first agreement in this way is being discussed between road authorities of Ile de France (State, City of Paris and counties).

The "standard contract" includes the main next clauses :

- the definition of provided data and of their minimal quality,
- the definition of services, the operator is authorised to use data for,
- the rules the operator has to respect regarding network operation strategy,
- the operator is responsible of information edition,
- the operator has to distribute data using standardised protocols,
- the operator has to distribute only sufficiently up to date information,
- the operator has to provide the authorities, for their own use, with information that it collects itself,
- the operator has, between defined limits, to distribute free public interest messages,
- the price of data use,
- the contract is valid for 5 years.

The operator can not resell information to an other operator, except if specified in the contract. Similarly, authorities can not resell or distribute information provided by the operator, except if specified in the contract. The contract defines also corresponding fees.

All operator committing itself to respect these specifications will have access to data (except an operator which would have been sanctioned for transgressing these specifications). This access

will be charged, according to present regulation (cost of editing and distribution), each authority being free to fix its own price for information use.

All service operators are allowed to open road information service. We don't plan to regulate a priori these services. On the other hand, services which wouldn't respect the specifications wouldn't be allowed to have access to wholesaler servers.

Currently, network authorities study equally the possibility to attribute a "Label Bison Futé" to information services which would reach minimal quality specifications, without this label be required to distribute information.

A work is in progress to define rules of application of the "code de la voirie routière" for an operator which wishes to collect its own information. Rules could be :

- respect of clauses guaranteeing safety and good maintenance of road network,
- authorisation only for information not already collected by authorities,
- necessity of common collection system if several operators wish to collect the same information,
- obligation to provide the authorities, for their own use, with collected information.

Taking into account implementation plans for traffic management systems, availability dates of wholesalers servers will be the following, first for a partial stage (part of the system or of information), then in final form :

Bordeaux	between 2001 and 2003
Ile de France	during the curse of 97 (final in 2002)
Lille	between 1999 and 2003
Lyon	during the curse of 97 (final in 1998)
Marseilles	during the curse of 97 (final between 199 and 2001)
Metz-Nancy	between 2001 and 2003
Nantes	between 2002 and 2004
Toulouse	during the curse of 97 (final between 1999 and 2001)

* **In-car road information**

The development of the in-car road information will be implemented first in the big agglomerations, thanks to progressive implementation of wholesaler servers, enabling public or private operators, operating under competitive status, to be provided with these data openly and transparently. Defined rules of access (to see above), will build the basis of public-private partnership for deployment.

RDS-TMC implementation

A service operator (MEDIA-MOBILE) already decided to launch a commercial service in Ile de France. In order that, it will used data collected by the DREIF, the City of Paris and counties around Paris.

The service will use the protocol ALERT+ and the progressive broadcasting of a free minimal service on the strategic network is planned, using ALERT-C protocol. The whole service will be accessible only to subscribers. On the other hand, the free minimal service will be accessible to all users of standardised RDS-TMC devices.

Studies are under way for the implementation in Lyon and Toulouse of similar services.

Similarly, a RDS-TMC service, using ALERT-C standard, will be implemented on A6 motorway (Paris-Lyon) in complement of 107.7 dedicated radios, during the curse of 1997. This service will be free and accessible to all users of standardised devices.

The progressive extension of this service to all the motorway corridors could take place later, according to the real interest demonstrated by users and to the number of sold European devices. An general free service, broadcasting CIR information in considered but not yet decided.

Other information services

Road information of the Ile de France are also available in real time on INTERNET.

French operators of cellular phone (SFR, ITINERIS) have implemented services of personalised road information exclusively for their subscribers. They could be provided with public information according to rules above.

It is also considered that a public operator, managed according to the competitive regime, launches a service of personalised information by telephone in Ile de France.

* **The Automatic Toll Collection (TIS)**

ATC development in France started first with a wide experimentation stage, due to diversity of needs and to rapid technical evolution. During this stage, several motorway companies have developed different systems, mainly aimed to their subscribers. They have enabled to validate the ATC use in various technical configurations (open, closed, mixed networks), as well in different modes of subscriptions.

From results of these experiments and of works undertaken within the European Union, French motorway companies have decided to implement an interoperable intersocieties ATC system (TIS). This system includes both the technical description of used equipment, that will be compatible with DSRC prestandard, presently discussed in TC278, and commercial rules of reciprocal acceptance of subscribers' cards.

The first implementation are planned to start in early 1997. French motorway companies committed themselves to accept TIS cards on all the toll stations at the latest 30 June 2000 (in a bit less of four years). Old systems, incompatible with TIS specifications will disappear gradually after this same date.

* **Studies and in progress experiments**

Beyond this first road telematics implementation plan, it is necessary to continue study and research works to prepare new applications development or to integrate technological evolution in existing applications. Some priority themes have been defined by the Ministry. They are used as guidelines for the preparation of projects presented and supported by the Ministry as part of French PREDIT and of European Union 4th FP.

Strategic researches
Impacts on employment of new intelligent transport services.

Security and ergonomy
Systems of driver assistance and active vehicle safety (including HMI),
Taking into account of in-car systems in driving simulators.

Intelligent Road
Urban traffic management
Safety and security
Pre-trip information

New services for users
Automatic toll and fees collection

In all these themes, the socio-economic evaluation of the impact of the new applications will be particularly examined.

The most important collaboration between public and private will take place in research sector, with an important joined work notably for study of safety systems, evolution of vehicles and evaluation of road telematics impacts on safety and on environment.

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REGIONAL TRANSPORT TENDERS IN HELSINKI AREA 1994-96

CONTENTS

1. GENERAL

Between January 1994 and February 1996, the Helsinki Metropolitan Area Council, YTV invited tenders for the whole of its regional bus transport. Helsinki Metropolitan Area regional transport covers a mileage of about 29 million kilometres per annum, operated with 436 buses. Regional transport accounts for about 40% of all bus services in the Helsinki Metropolitan Area.

At the turn of the decade, the renewal of traffic operator contracts came under review. The Helsinki Metropolitan Area Council began to prepare to invite tenders in spring 1990. The new Passenger Transport Act that came into effect in March 1991 enabled tenders to be invited for these services. In November and December 1993, the Board of the Helsinki Metropolitan Area Council decided on the tendering principles and selected the routes to be included in round 1.

2. HOW THE TENDER INVITATIONS WERE IMPLEMENTED AND AWARDED

The tendering principle selected was full cost competition, in which the authority inviting the tenders receives all ticket revenues, the traffic operators drawing up their tenders on the basis of the overall costs of the service. The tendering authority plans the routes, schedules and schedule schemes, leaving actual implementation of the transport to be planned by the transport operator. Full cost competition was chosen for reasons such as simplicity of calculation and good operative experience.

The Helsinki Metropolitan Area Council makes the award from the approved tenders on the basis of overall economy, i.e. price and quality. Quality factors include vehicle stock quality, client service and transport service quality, the operator's quality policy, location of the depot and the operator's years of experience, as well as any other factors mentioned in the tender. Each tender is given points, the maximum being 100, distributed as follows:

- Overall price — maximum 70 points
- Cost of mileage change — maximum 5 points
- Vehicle stock — maximum 15 points
- Other quality factors — maximum 10 points

Regulations concerning bus stock were issued in order to ensure that high-quality vehicles would be used throughout the contract period.

The type of stock to be used is resolved separately for each route tendered for, based on passenger numbers, route lengths and passenger turnover. Three different types of bus were defined: city bus, regional bus and low-floor bus.

Traffic operators are required to draw up a quality programme.

Table 1. Keyfigures in inviting tenders for regional traffic

Round no.	1	2	3	4
Tender schedule				
• time	1-3/94	10-12/94	2-4/95	10/95-1/96
• beginning of traffic	1/95	8/95	1/96	8/96
Traffic volume				
• share of total regional transport (%)	15	25	30	30
• millions of km/a	4,4	7,2	8,7	8,4
• vehicle quota on weekdays	55	121	118	141
Number of routes tendered for	13	12	15	16
Km/route				
• average	336 600	603 100	580 900	522 500
• lowest	71 700	210 900	146 000	77 100
• highest	741 900	1155 200	977 100	1 075 500
Buses per route				
• average	4,2	10,1	7,9	8,8
• minimum	2	3	2	4
• maximum	10	21	15	14

3. PARTICIPATION

The tender was organised in four rounds. Seven to 11 bus operators already operating in the area participated in all four rounds. The number of outside operators decreased from 11 in round 1 to one in rounds 3 and 4.

Since several large groups submitted tenders on behalf of their subsidiaries and parent companies, it is more realistic to measure the number of participants as actual independent parties, in which case each group is considered a single participant. Tenders may be for single routes or combinations thereof. *Table 2* shows key figures for participants and tenders.

Table 2. Number of participants and tenders in the rounds.

Round no.	1	2	3	4
Total number of participants	23	16	13	11
Independent participants	22	14	9	8
• already active	11	10	8	7
• new operators	11	5	1	1
Independent participants per route				
• average	7,6	5	4,6	3,6
• minimum	4	3	3	2
• maximum	11	10	5	6
Total number of tenders	112	78	92	63
• combined tenders	25	20	25	17
Routes tendered for per participant				
• average	4,7	3,7	6,5	7,8
• minimum	1	1	1	2
• maximum	13	12	15	16

The size of the route and the vehicle stock requirements affected participation levels. The most tenders were received for routes where

- traffic runs all day
- the total mileage is 100 000 to 500 000 km/a
- the stock requirement is two to six buses
- use of two types of stock, city bus and regional bus, is allowed

No more than 5 tenders were received for large routes of over 700 000 km/a with a stock requirement of at least 10 buses. An exception to this were the airport routes in the first round; they attracted 10 tenders. In addition to the 5 major companies in the area major routes were tendered for by 3 other operators in rounds 2 to 4.

4. MEANS OF COMPETITION AND COMPETITION ACTIVENESS

In round 1. the municipal STA/PKL (owned by Helsinki), submitted a tender for 9 routes out of 13 and won them all, i.e. 82% of the total mileage. The cost level was on average 36% lower than the cost level before the tender. For the remaining routes, costs were reduced by 0% to 30%, making the total cost reduction 33.2%. Swebus won two routes, and municipal Vantaan Liikenne (subsequently Linjebuss Finland) and Helsinki City Transit (HCT) both won one minor route.

In round 2. the total traffic cost reduction was 25.7% - less than in round 1. Swebus won 8 routes, or 62% of the total mileage. However, most of this was traffic already operated by the group; the group's market share increased only slightly. The private Oy Liikenne Ab, which won two major routes, became the second winner of round 2, a completely new operator snapping up 1.8 million km per year. The private Nurmijärven Linja group was the third winner in round 2, retaining one route already operated and adding another.

In round 3. the total traffic cost reduction was 29,3%. The major winner in round 3 was Linjebuss, which had lost a significant number of routes in rounds 1 and 2. Linjebuss won nine routes, or 65% of the total mileage. The second major winner was STA, with five routes, or 25% of the total mileage. The Swebus group won one route already operated.

In round 4. the total traffic cost reduction was 30%. Swebus won 15 routes out of 16, or 87% of the total mileage. HCT won one major route.

The cost differences between the highest and lowest tenders and the cost reduction for each round are shown in *Table 3.*

Table 3. Cost differences between two best tenders and cost reduction in the rounds of regional transport tender invitations

Round no.	1	2	3	4
Cost margin (%)				
• lowest	3	0	0	2
• highest	36	17	13	24
• average	19	5	4	8
Cost reduction (%)				
• lowest	-1	21	25	29
• highest	42	34	32	34
• average	33	26	29	30

Apart from cutting costs, companies have also been improving their chances by concentrating on quality, the main quality factor being the bus stock, in particular its age. The winning tenders featured a total of 127 new buses, or 29% of the vehicle stock included in the tenders. The average age of the vehicle stock in regional transport was 4.9 years in 1993, before the tender invitations. The average age of the vehicle stock in the winning tenders (not weighted by total mileage) was 3.2 years.

Improved quality control and consideration of environmental factors in corporate operation was also mentioned in many of the tenders.

In round 4, Swebus offered to install CRT filters in both old and new buses to reduce harmful exhaust emissions.

Combined tenders accounted for 22% to 27% of the total number of tenders in the various rounds. In round 1, combined tenders were mainly used as competition tools by new operators aiming to enter the regional transport market. In rounds 2 to 4, combined tenders were also put in and won by corporations already operating regional transport; that is, combined tenders became competition tools for large companies. Combined tenders won 14% to 82% of the total mileage in the various rounds.

The tenders were evaluated on the basis of overall economy, consisting of the cost tendered and quality factors. The point total of winning tenders varied from 80.78 to 94.50, the average being 89.56 points.

Table 4. Point totals of winning tenders and point margins of the least-cost tenders in the overall economy comparison

Round no.	1	2	3	4
Winner's point total				
• lowest	84,60	80,78	84,36	87,43
• highest	94,50	90,36	93,26	92,40
• average	89,61	87,35	89,55	91,20
Point margin of least-cost tenders (%)				
• lowest	0,60	0,91	0,19	0,81
• highest	18,00	6,25	7,65	16,75
• average	10,01	2,16	3,62	8,66

Table 4 shows that the point margins of the least-cost tenders were lowest in rounds 2 and 3, i.e. only a few points on average, whereas in rounds 1 and 4 the margins were 8 to 10 points. However, in every round there was at least one route that was awarded with a margin of under one point between the winner and the runner-up, showing that the competition at least for some of the routes was very stiff indeed.

We can safely say that there has been a degree of real competition in all rounds. The cost competition was particularly close in rounds 2 and 3, since the winners' point margins were quite low.

Rounds 1 and 4 showed a determined effort on the part of STA/PKL and Swebus, respectively, to corner the market. The means of competition used included cost-cutting (by 36% and 30%, respectively) combined with a large proportion of new vehicle stock (33% and 42%, respectively).

The level of competition was increased in round 1 by the large number of participants, which was evidently due to the interest generated by the opening of a new market. The number of independent participants in rounds 3 and 4 was eight and nine, respectively, and no new companies have entered the market.

5. EFFECTS OF THE TENDER INVITATIONS

The tendering process cut the costs of regional transport by 29.2% on average, a reduction of FIM 105 million per annum.

The prices of regional tickets were reduced by 8% from the 1994 level in 1995 and 1996. Due to the price reductions, the income from regional transport tickets in 1996 is expected to be 8% (FIM 24 million) less than in 1994.

The total mileage was increased by 560 000 km/a in the 1995/96 transport plan and by 944 000 km/a in the 1996/97 transport plan. The effect of these increases on operating costs is about FIM +12.8 million.

The quality of the vehicle stock has also improved. The number of regional type buses with 1 + 1 doors in city traffic has dropped. Seven regional transport routes have introduced or will introduce low-floored buses. Winning tenders also included a number of semilow-floored buses which can be considered quite user-friendly.

Operator changes have been implemented smoothly. The content and volume of customer feedback received by the Helsinki Metropolitan Area Council has not changed since the tendering process began.

The sector has become more insecure from the point of view of employees of bus companies, particularly drivers. Working conditions have deteriorated in companies that used to be municipal authorities and for drivers that have had to transfer from one company to another.

The Euro II standard emission level required of new buses, together with the large number of new buses introduced into regional transport, has reduced the level of exhaust emissions. The CRT filters introduced in round 4 have reinforced this trend.

6. CHANGES IN MARKET STRUCTURE

In 1993, before the tender, 10 independent operators ran the regional transport routes. 23 independent operators participated in the tender rounds; six of these won routes. Thus, the tender and the corporate acquisitions connected with it have concentrated the market structure.

The ownership of five regional transport companies changed due to transactions that took place during the tender.

The STA group gained the most in market share (+4.3 million km/a), representing a fourfold increase in its regional transport volume and slightly surpassing Linjebuss.

Oy Liikenne Ab and HCT, both of which operate city transport in Helsinki, increased their market share by 1 to 2 million km/a each. Nurmijärven Linja Oy also increased its market share in regional transport.

Swebus and Linjebuss, the largest regional transport operators, both lost some of their market share. Swebus's losses were slight (-950 000 km/a), while Linjebuss, with a loss of 3.6 million km/a, was definitely the major loser.

Operators changed extensively; a new operator took over in 53% of the total mileage.

The market shares in regional transport before and after the tender are shown in *Table 5.*

Table 5. Regional transport market structure in 1993 and 1996

	Market share in regional transport (%)	
Operator	1993	1996
Regional transport operators 1993		
Swebus group	48,5	46,4
Linjebuss group	33,9	19,9
STA group	5,1	20,2
Nurmijärven Linja group	1,4	3,1
Lähilinjat Ltd	5,1	0
P. Tyllilä Linja/Pohjolan Liikenne Ltd	3,7	0
Åbergin Linja Ltd	1,6	0
Keskuslinja Ltd	0,8	0
New regional transport operators		
Helsinki City Transport	0	4,0
Oy Liikenne Ab	0	6,4

7. MAJOR BENEFITS AND DISADVANTAGES OF THE YTV REGIONAL TRANSPORT TENDER

Briefly, the benefits of the tender were:

- Regional transport costs have been reduced by 29%, saving the Helsinki Metropolitan Area Council FIM 105 million per annum.
- Regional transport ticket prices have been cut by 8%.
- Municipal compensation for regional transport has been reduced by FIM 15 million to 20 million per annum.
- Regional transport services have been improved by increasing supply.
- New high-quality vehicle stock has been introduced.
- Service production has improved as the operators have enhanced their cost-efficiency.

Indirect benefits include:

- Sales income acquired by the Cities of Espoo and Vantaa from selling their bus companies.
- Benefits to the Cities of Helsinki, Espoo and Vantaa through being able to negotiate more advantageous operator contracts for their respective city transport operations under a real threat of competitive tendering.

Disadvantages or negative phenomena related to the process include:

- Laying-off of staff and deterioration in working conditions, which in the long term may decrease the attraction of the sector and affect the level of customer service adversely.
- The limitation of competition to regional transport, giving an advantage to operators handling major amounts of city transport in any of the cities in Helsinki Area.
- Market structure concentration, which in the long term may reduce competition and raise costs.

reference: Helsinki Metropolitan Area Council YTV. YTV Regional Transport Tenders 1994-1996. Helsinki 1996.

SYMPOSIUM FRANCO-FINLANDAIS SUR LES TRANSPORTS

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Financing and institutional organization of urban transport in France

Maurice ABEILLE - CERTU FRANCE

France has historically got an original situation regarding to most other countries. Without mentioning other urban services, there is a long tradition of complex relations in public transports between public power and private firms.

At the end of the 19th century, public transport, which were mainly tramways operated networks, have known a successful development thanks to private companies which assured their rentability by receipts, material supplies and electricity distribution.
There were three forms of contracts :
- the franchise,
- the lease franchise,
- and the public administration with a mandate contract.

The system of franchise contracts were of a very long length (51 years).

This kind of organisation began to decline after 1945 because of car expansion which introduced a competitive mode by decreasing tramway rentability and increasing road congestion.
Thereby, operators could not anymore keep their agreements. Loss of tariff freedom accelerated the disinvestment of private capital in public transports.
During the 1970's, operators were no more able to respect contractual clauses and to renew materials and fixed equipment.
As a consequence, a change in contract categories could be observed progressively as well as the disappearance of the notion of franchise contract.
In 1979 and 1980, the first series of new laws put an end to this uncertainty by the specification of new types of contracts for the management of transport networks.

I. The institutional organisation

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The administrative organization of France (58 million inhabitants in 1993), is comprised of three levels of public authority, assemblies elected by direct public suffrage. In ascending order of their importance in terms of size are :
- the « Communes » (municipalities), approximately 37,000 in number, administered by a « conseil municipal » (municipal council), which elects a mayor from within its own ranks to head the executive body for the Commune ;
- the « Departments », 100 in number, administered by a « conseil général » (general council), under the authority of a « President du conseil général », who is elected by the general council members ;
- the « Regions », numbering 26, administered by a « conseil régional » (regional council), under the authority of a « Président du conseil régional », elected by the regional council members.

In FRANCE, outside of the Paris Region, responsibility for organizing urban and interurban transportation services has relied, for the most part, on local government ever since the enactment of the decentralization laws of 1982-83.

In 1982, the law on internal transport (LOTI-law : loi d'orientation sur les transports intérieurs) made a clear distinction between two functions in the system of public transport :
- the authority that is in charge of the organization of public transport which is considered as public service
- the operation of public transport, which can be done by the authority through a public company (what we call in France « régie ») or under a contract of delegation of the operation linking the authority with an operator. This company can be a semi-private company, with shares owned by private and public partners, or a private company. But this law is not applicable for Ile-de-France. So we will have the distinction :
- France outside Paris Region
- Paris Region.

I.1 The public service organization in France, outside Paris Region

I. 1. 1. Public service organization

Within the incorporated urbanized zones, the organizing authority may be a municipality or a group of municipalities assembled in the aim either of exclusively providing transportation services or of managing other public service areas as well. In any event, an urban transportation services boundary ("P.T.U." in French) is drawn, inside of which co-ordination activities are carried out.

Outside the PTU, public transports are organized by departments.

195 conurbations have defined an area of urban transports and are engaged in public transport organisation as follows :

- towns (municipalities)	75	39%
- urban associations	110	56%
- mixed syndicates	10	5%
	195	100%

Mixed syndicates are associations between local communities or public entities with the municipalities.

In France, the State intervenes first and foremost to limit service rate hikes, to pursue overall policy goals and to subsidize major capital investments in infrastructure, while entrusting local authorities with a good deal of manoeuvring room in developing and implementing their own policies.

I. 1. 2. Public service administration

Operators status : according to the kind of the chosen administration (direct or undirect administration), the operator will be different :

direct administration : public companies	17	9%
undirect administration : private companies	126	71%
mixed economy companies	39	20%
total	195	100%

Undirect administration represents the main part and can be assured by private companies which depend on national groups (three big groups and one association) or by mixed economy companies mainly constituted by local public capital and private capital from one of the three national private groups.

Most of the time, there is only one operator though more complicated cases can exist. When undirect administration is in use, the operator is chosen after the result of competition and a consultation which respects strict laws.

PROCEDURE FOR THE CHOICE OF THE OPERATOR
Delegations of public services are presently submitted to a tendering procedure for the presentation of various competing offers (except when the service is operated by a public administration in the form of a public industrial and commercial commercial (EPIC)) (Loi Sapin, 1993).

PRINCIPLES FOR DELEGATIONS
The Board of the organizing authority makes a decision on any delegation of local public service principle, and their final decision is based on a report which provides a description of the characteristics of the transport service to be supplied.

PUBLIC CALL FOR APPLICATION

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After a public call for application, the competent authorities shortlist candidates admitted to submit a bid. The organizing authority provides each candidate with information describing the quantitative and qualitative characteristics of the services.

AD HOC COMMISSION INTERVENTION
The envelopes containing the offers are opened by a commission made of the president and five representatives of the organizing authority.

FREE NEGOTIATION
In view of the opinion of the commission, the authority empowered of signing the agreement starts up an open negotiation with one or several competing companies, and recommends its choice of a company to the board of the organizing authority.

APPROVAL BY THE DELIBERATIVE ASSEMBLY
At least two months after the seisin of the commission, the organizing authority comes to a decision regarding the selection of a delegatee and the delegation contract. It is only possible to resort to a direct negotiation procedure when, subsequently to the advertising of the tender, no bid has been received or accepted by the public authority.

The relation between the local transport authority and the operator is written in a contract.

I. 1. 3. Contracts between public authorities and operators

The contracts explain the role of each part (especially the financial part) as well as risk sharing out :
- investment risk
- service risk and its cost
- commercial risk on receipts.

The agreements are of fixed duration, according to the services required of the delegatee (and of the type and amount of capital investment to be provided if the delegatee has a responsibility in this field). It is recommended that the agreements include the measures to be taken at the expire date.

The duration of the agreement cannot exceed the duration of depreciation of the installations when these are charged to the delegatee.

The delegation can be extended up to a year, for common interest purposes.

The agreement must specify :
- the general content of the services provided,
- the conditions applicable to operation of the services (timetables, periodicity, etc., ...),
- ticket fares paid by passengers and the impact of specific parameters or indexes on ticket fare increases,

- the financing conditions of the services,
- the obligations of both parties to users,
- the methods to be used for monitoring the use of funds committed or guaranteed by the organising authority.

Every year, prior to June 1st, the delegatee is expected to produce a report, including the accounts of the overall activities and an analysis of the service quality, as well as an appendix, to allow the organising authority to assess the execution conditions of the public service.
In addition, it is recommended that the conditions should provide :
- conditions of interruption of the services before the agreement expires,
- reasons for the re-negotiation of the general terms before the due date.

Recent contractual trends :
The actual content of the contracts is tending increasingly to make the operator a simple supplier of services. His remuneration is no longer linked only to the growth of the service on offer or to the number of customers. It is now also linked to :
- productivity conditions (the vehicle-km/salary-paid ratio, for example),
- the attainment or not of cost per kilometre targets, and disparities between budget forecast and return,
- the progression of the income/expenditure or similar ratios,
- more and more respect of the quality of the service offered to the user.

Today, urban public transport annual statistic reports classify contracts in three different families, except for contracts where the operator accepts all the risk, i.e. :
- operation contracts with financial compensation,
- operation contracts at a fixed price,
- management contracts.

Operation contract with financial compensation
The operator is fully responsible for operation expenses and takes a more or less significant commercial risk on revenues, provided that fares are set in the agreement.

On the basis of the operator's revenue forecasts, the organising authority commits itself to pay the operator :
- either a lump sum compensation,
- or the difference between actual and guaranteed revenue.

This system is generally complemented by :
- a compensation on fare reductions granted to certain categories of passengers and imposed on the operator,
- a sharing of revenue-related risks according to the actual passenger traffic level.

Operation contract at a fixed price

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The organizing authority agrees the operator a fixed annual price, set according to operation cost estimates, regardless of their actual amount. These costs can be calculated on the basis of a price/km, or more comprehensively, for a given activity.
The operator can also receive an additional remuneration (either as a bonus or a penalty payment), according to the actual evolution of the transport service and of readership.

Management contract
The organizing authority ensures, in case revenue is not sufficient, to cover the operator's expenses within the limit of the annual budget it has approved.
The operator's remuneration depends upon the type and volume of services supplied, and according to management results, a bonus or penalty system is set up.

Contracts called « own risks » do not exist anymore in public transport though they are still called like this.
Other contracts represent :
- financial compensation : 34%
- contractual price administration : 35%
- management contract : 27%

In recent contracts, operator is responsible for production risk. The authority, in some cases, defined a level of revenue with penalties in the case it is not reached, the responsibility of fares assumed by the authority.

I. 2. The institutional organization in Ile-de-France area

Paris, the Capital City of France, is with its suburbs by far the largest French conurbation (10.8 million inhabitants for all of the Ile-de-France region). From an institutional perspective, it has always been treated as a special case. This is particularly true for urban transport since it does not fall under standard French conurbation common law.

I. 2. 1. The public transport organizing authority : the « Syndicat des Transports Parisiens (STP) »

For the Ile de France Region, a specific organizing entity has been set up : S.T.P. (Paris Transport Authority), within which the State plays a fundamental role. The Region and its eight component departments, that participate fully in the authority's activities, do nonetheless adopt a more dynamic stance than mere "spectators".

Since 1959 (order 59-151 of January 7, 1959) the STP has been given the responsibility to organise mass transit within the « Paris Transport Region » which since January 1912 is the same area as the Ile-de-France region. The STP

administration council is composed of 24 members, equally divided between representatives of the State and the Departments. It is presided over by the Prefet of the Ile-de-France region who has a deciding vote (named by the State).

The STP has an independent budget of which the « Employer's tax » is the main financing source (97%).

The STP is responsible for the choice of transit routes, the choice of transport operators, the transport operation mode, the fare policy, the approval and management of the transport operator budgets (however, within the regulatory frame for transport co-ordination, the local authorities may sign agreements with operators already registered in the transport plan, since they intend to improve the public transport services).

Contrary to the public transport organizing authorities in the provinces, the STP is not alone in its responsibility for major mass transit capital investments. Once the STP has approved the projects, the corresponding investments are set up with the frame of decisions taken by an inter-ministry body, the « Fonds de Développement Economique et Social » (FDES : economic and special development funds), in co-ordination with the region.

The reciprocal commitment of the State and the Ile-de-France region in the field of transit and road capital investments are set up by the State-Region « contract plan » which fixes the principal aspects of the projects to be executed for à five year period and the corresponding method of finance.

I. 2. 2. Public service administration

The organization of mass transit relies for the most part on two state owned companies, the RATP (Régie Autonome des Transports Parisiens) and the SNCF (Société Nationale des Chemins de Fer).

- The RATP :

The RATP is not only responsible for the operation of the lines is has been assigned :

* it performs feasibility studies and conceptual design of new dedicated right-of-way lines or extension of existing lines, for approval by the STP,
* it performs the design, tendering and construction management of approval projects, handling of all public works administrative responsibilities,
* it determines the conditions for construction, supply of equipment and operation of the transport system assigned to it as part of its mandate.

- The SNCF :

In the Ile-de-France region, apart from the rail lines of national interest, its authority is similar the RATP, but for the suburban railway and RER lines which it operates. A contract plan signed between the State and SNCF determines the objectives assigned to

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the company (and to the SNCF group) as part of a national master plan, and the resources to be applied for this purpose.

- The APTR and the ADATRIF :
The APTR « Association Professionnelle des Transporteurs Routiers », professional road carrier association (53 members, approximately 1,500 vehicles) and the ADATRIF, « Association pour le Développement et l'Amélioration des Transports en Région d'Ile-de-France », association for development and improvement of Ile-de-France regional transport systems, (30 members, approximately 1,500 vehicles) are both private enterprise associations, which have a rather limited role (though growing), in comparison with the RATP and the SNCF, (7.5% of total urban public transport ridership in the Paris region).
The APTR and the ADATRIF member companies operate the bus routes on the periphery of the Paris transport area.
The APTR and the ADATRIF carry approximately 20% of the overall Ile-de-France region regular bus line ridership.

II. Financing the urban public transport

In France, as in virtually all other developed countries, the revenue from the fare-paying passengers of the urban public transport systems is insufficient to cover the operating costs, and the development costs in particular.
The revenue from the fares represents, on average, less than 50% of the total network operating costs (outside of the Ile-de-France region), and this frequently does not include the cost of capital investment depreciation. This revenue is therefore insufficient for the renewal of the rolling stock and other equipment.
The situation arises from the willingness of the public authorities, both at national and local levels, to apply fares which favour the see of public transport, over a long period of time and until recently, also because of a government policy to control inflation by limiting price rise in the consumer field.

In the financial domain, the government has therefore instituted a collection of measures so that the financing of the transport networks depends mainly on three economics agents :
- the users,
- the employers,
- the local authorities and the State.

II. 1. Financing from fares

Outside the Ile-de-France region, in 1995, the users directly financed 45% of operating costs. The percentage is higher in agglomerations which have an underground or a tram than in small agglomerations :

Numbers on 166 networks, in 1995

Mean and median : $\frac{R^*}{D}$ R* without tariff compensation

Population	Number of networks	Median	Mean	Min	Max
+ 300,000	14	47%	46%	28%	64%
between 100,000 and 300,000	48	42%	46%	19%	60%
between 50,000 and 100,000	41	34%	39%	15%	69%
- 50,000	63	28%	31%	6%	64%

The mean cost of a trip is approximately 7.90 FRF and the passenger directly pays only 3.07 FRF, thanks to the important increase of the subscriptions (including tariff reduction) and to the free of payment ; this one represents on average 17% of travels.

The fare structure :

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The fare structure applied to urban transport other than in the Ile-de-France region has been excluded from the common right to freedom of pricing almost continuously since 1949, except for a short period (16 August 1985 to 17 July 1987).
Principles :
the legal authority for the setting of fare structure and levels belongs to the organizing authorities, subject to the overall powers of the State in respect of prices.

The fares are determined by decree, and are modified annually according to the cost of equipment, the cost of maintenance, the cost of energy, and salary levels. (The maximum fare increases are fixed by interministerial decision).
This rule may be waived under certain conditions, provided the Prefet gives his consent.

AUTHORISED MAXIMUM ANNUAL FARE INCREASE CEILING SINCE 1987

YEAR	1988	1989	1990	1991	1992	1993	1994	1995	1996
Maximum authorised increases	2.5%	2.2%	3.5%	3.8%	3.3%	3.0%	3.5%	2.7%	2.5%
CPI* variations	2.7%	3.6%	3.4%	3.2%	2.4%	2.1%	1.7%	2.1%	

* CPI : consumer's price index.

THE SPECIAL CASE OF THE RATP AND THE PARIS SUBURBAN SNCF

Since 1989, the contribution of passengers to the coverage of operating costs in public transport (RATP and SNCF) has remained quite stable, approximately 38-39%. The average price per trip paid by passenger had risen (all taxes included) to 3.59 FRF per journey by 1992.

II. 2. Financing by employers

The Versement de Transport (transport tax)
Since 1971, in the Paris region, and since 1973 in the remainder of the country, the French authorities have set up a system whereby public transport can be financed by employers, by the creation of a special tax, the income from which is assigned to public transport. This is known as the « Versement Transport », or the transportation tax, or the employer's tax.

<u>In France outside Ile-de-France Region</u>

The introduction of the levy depends upon a decision taken by the organizing authorities in the conurbation.
This payment is collected from all employers with more than nine employees inside the « urban transport perimeter » (PTU).

The basis for calculation of the tax is the salary. It is collected via the organizations responsible for the other social contributions. Rate at which the tax is set is at the discretion of the local organizing authority, within the limit of a ceiling set by the law, and which has progressed with time.

The « Versement transport » is set up by :
- 100% of organizing authority > 100,000 inhabitants
- 80% of organizing authority between 20,000 and 100,000 inhabitants.

The profit was 7.8 million of FRF in 1993, that is 330 FRF per inhabitant of the urban transport perimeter.
It represents to 35% of the exploitations expenses.

In the Ile-de-France Region

There are several rates for Paris, Department of first periphery and departments of second periphery.
The profit represented 9.4 millions of FRF.

Since 1982, the employers of Ile-de-France Region have to pay a part of the price of the weekly, monthly or annual pass purchased by their staff for their journeys from home to work using the public system. This contribution is limited to the area within the operating limits of Ile-de-France region. The rate of this contribution has been 50% since October 1st, 1983.

The repayment by employers to their staff of half of the cost of travel to work by public transport corresponded to a transfer of charge from the users to the employers of about 2,300 million francs in 1993.

All of the part of employers represents 39% of the exploitation expenses.

II. 3. Financing by the public authorities

II. 3. 1. General case outside the Ile-de-France region

The role of the local authorities

A large part of the operating costs of the networks is not covered by the revenue from fares and the transport tax. This missing part is covered by the budget of the organizing authority. These operating subsidies, the final payer of which is the local taxpayer, represent some 20% of the total operating costs.

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In the investment area, the costs are mainly borne by the organizing authority. Self-financing of the networks is on a very low scale (some 5%), and the investment resources are drawn equally from the income from the transport tax and from loans taken out by the organizing authorities (40/40), with the addition of about 15% in the form of equipment subsidies.

The role of the State

The State financially contributes to the development of public transport by granting the relevant projects of the local authorities.
The financial aid to urban public transport from the State is defined in the circular dated December 21st, 1994 from the Land Transport Department of the Ministry of Transport (DTT, Direction des Transports Terrestres).
The State provides grants to local authorities modernizing their public transport. By way of such grants, the State encourages local authorities in developing an overall travel pattern policy following three main principles :
- to get a global politic on transports,
- to favour intermodality,
- to give priority to modernize existing networks.

The budgetary allocations by the State was of 636 million of FRF in 1994 for investments of about 4,500 million of FRF as following :
- public transport on own right-of-way : 46 %
- purchase of rolling material : 33%
- other investments : 21%

They are financed by :

autofinancing	49%
loans	31%
subventions + State	5%
others	15%
total	100%

II. 3. 3. The case of the Ile-de-France region

Financing operating costs

The operating subsidies (the compensatory payment) paid to the RATP and the suburban SNCF with the agreement of the STP - Syndicat des Transports Parisiens - (apart from the fare compensation payments taken from the « Versement transport » - the transport tax) are paid by the State and local authorities represented on the STP, namely the Departments. The distribution rule is 70% from the State and 30% from the Departments.
In 1992, the contribution of the State amounts to 20% of all operating costs, all taxes and charges excluded, and that of the Departments to 10% of this total.

The overall operating subsidy was 7,690 million francs (compensatory payment) or 8,286 million francs including compensation for reduced fares, all taxes included, in 1992, which is 712 or 767 FRF per inhabitant of the served area.

Passengers	**10,462 million FRF**	**39%**
Employers	**6,586 million FRF**	**25%**
State	**5,297 million FRF**	**20%**
Local communities	**2,270 million FRF**	**8%**
Miscellaneous	**2,121 million FRF**	**8%**

Financing capital investment costs

The RATP and suburban SNCF companies also receive equipment subsidies from the public authorities for the extension of the networks and for some specific modifications. The remainder of the capital costs (in particular rolling stock) must come from their own resources, by loans, and when possible, by any excess from the transport tax.

The equipment subsidies for extension projects are in general paid by the State and the Ile-de-France region.

These concern only the infrastructure (civil works and equipment). Rolling stock for network extensions is financed entirely by the RATP and the SNCF, as it is renewal.

As a general rule, the State and the Ile-de-France region contribute according to a variable proportion which depends on the type of operation : equally for dedicated right-of-way road infrastructure (50/50) and according to a different proportion for rail extension projects (since 1994, 30% and 50% respectively for most projects, and 0% and 80% for specific operations decided by the region). For works concerning extension of the metro, the RER and the suburban railway lines, the overall subsidy rate is 80% since April 1984. The remaining part has to be covered by the companies

Loans (regional loans excluded)	3,740 million FRF	39 %
Own resources and miscellaneous	3,373 million FRF	35 %
Region (loans included) and local communities	1,393 million FRF	15 %
State	1,019 million FRF	11 %

International infrastructure projects around the Gulf of Finland area

Finland

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1 (6) pages

Contents

1. FINLAND'S SOUTH COAST AS A PART OF THE NORDIC TRIANGLE

1.1 The Nordic Triangle project

Within the Nordic Triangle project, a high-quality road and rail link is created between Copenhagen, Oslo and Stockholm with an extension over sea to Turku and Helsinki and on to the border of Russia. The link has a connection to the continent in west, too. The Great Belt link will be opened to rail traffic in 1997 and to road traffic in 1998. The Oresund bridges and tunnels between Denmark and Sweden will be completed in the year 2000.

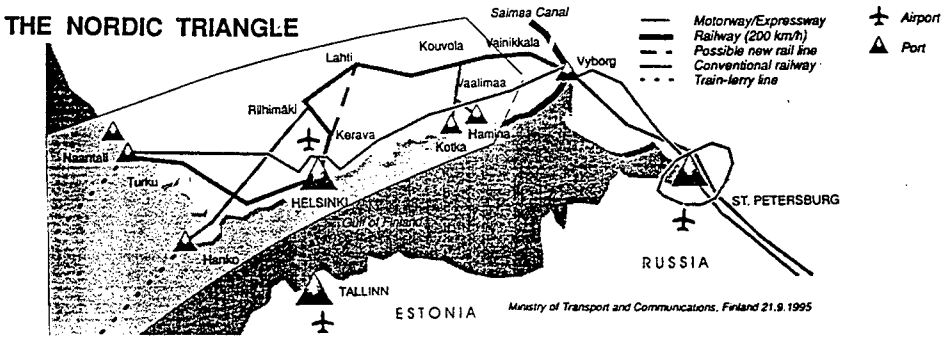
The Nordic Triangle is in Sweden a program of 4.4 billions ECU (= 25 billions FIM). Its motorway links and modernized railways will provide high speed transit between the Nordic capitals. From Turku to the border of Russia, the Nordic link programs have an estimated cost of ECU 2,5 billions. That exceeds the resources available in Finland in next fifteen years. Thus, a remarkable EU's and other outer financing is obviously needed.

1.2 Transit route developes to an international production and service center

The economical and political integration of west and central Europe and the openings of east Europe for free trade, traffic and telecommunication have dramatically changed the situation in South Finland. The first stage in the development has been the rapid rise of transit through Finnish ports, railways and roads. E.g. Vaalimaa border station at E 18 road reports an average 80 % yearly growth of traffic in 1992-95. The ADT-volumes of border crossings in 1995 were 860 cars and vans, 40 buses and 520 trucks.

At the moment (1996) the road, rail and harbour connections are relatively competitive on the northern shore of the Gulf of Finland (GOF) compared with routes through southern shores of the Baltic and also the Middle-European ones. The new logistics in Russia uses much road freigth and containers. That operation type needs special harbour and handling capacity, which is found in Finland. The Scandinavian road to St Peterburg is technically quite good, in the class of first-stage-motorway the biggest part between Vyborg and St Peterburg. The border crossings also run smooth in Finnish-Russian border stations due to the efficient finnish-german-russian data handling system (Project TEDIM).

Later on in the future (say in 2010 ies), the Finnish southern coast area expects to develope to a belt of Value Adding Logistics with warehousing, packing, delivering and other service functions. With that policy, Finland is trying to get more profit of logistical services than it it possibly with a transit and gateway concepts.



2. BORDER CROSSINGS

Finland has altogether 9 border crossing stations along the eastern border with Russian Federation. Four of them: Vaalimaa, Vainikkala, Nuijamaa and Imatra are located at the eastern end of the Nordic Triangle. Since 2nd World War, Finland has build up friendship and cooperation with Russia (then Soviet Union). As a result of this 50 years effort, the Finnish-Russian border now owns much less tension than many other borders between Central and Eastern European states. That makes a big advantage for future development.

In all the border stations, big investments are made or going on to solve the queuing and toll operation problems. The new terminals have been this year (1996) opened both on railway and the roads. A typical investment example is 100 millions FIM to new Buslovskaja railway station on the Russsian side of the Border.

3. PORTS AND WATERWAYS

3.1 Helsinki builds a 12 millions tons per year cargo harbour

The City of Helsinki has accepted in April 1996 an investment of great harbour. This new Vuosaari harbour will be constructed within the years 1999-2003. The estimated cost will be FIM 1,2 billions for harbour an FIM 0,8 billions for seaway, rail and road connections. The Vuosaari harbour will be located close to the E 18 road at the Helsinki Ring III and the Helsinki-Vantaa Airport, too.

The estimated yearly capacity of the Vuosaari harbour will be about 12 million tons of containers and general cargo. After the Vuosaari harbour is finished shortly after the year 2000, the existing container and ro-ro harbours at west and east sides of the city core will be redeveloped to residential and recretional zones.

3.2 Seaports of Kotka and Hamina increase capacity

Besides the big project in Helsinki's Vuosaari, many other Finnish cities are expanding their harbour activities, too. A special attention is to be paid for project in Kotka and Hamina, which are locating nearets to the border of Russia. Because of cheapness and effectiviness of sea transport, the vessels naturally tend to travel as far close to the final destinations as possible. Thus, the demand for harbour services has been very fast growing in Kotka.-Hamina area of South Kymenlaakso.

Both Kotka and Hamina provide excellent facilities and latest handling equipment. The cities have invested to their harbours billions during a decade. The yearly transport volume of these two harbours was in 1991 about10,2 million tons and has rised rapidly up to some 15 millions. 4-5 of that volume is at the moment (1996) freigth to/from Russia. Both

harbours are technologically continuously developed according to the actual needs. The Kotka and Hamina ports are feeded in exports mainly by trains but in imports for a great deal by trucks, which often are Russians or eastern Europians for their nationality.

3.3. Inland waterways net of Finland to be expanded?

The old ideas of connecting the big lakes Saimaa and Päijänne with each other and the Gulf of Finland are again discussed. The Kymijoki Canal construction is one major question in developing the Finland's inland waterway system. Its estimated cost will be several hundreds of billions FIM. Closer plans and schedules are not yet available.

4. RAILWAYS

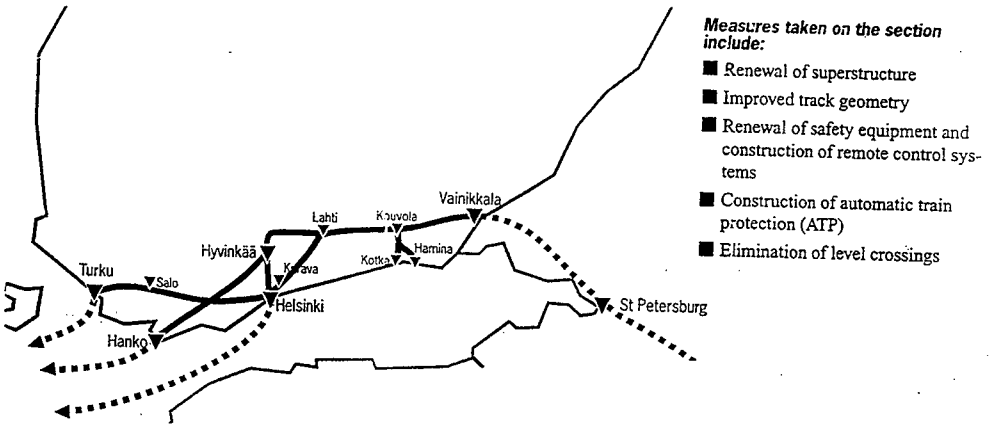
4.1 A major FIN-RUS connection

The train connections between Finland and Russian Federation are traditionally well operating since 1870, when the railway between Riihimäki and St Peterburg was opened. These days, some 25-30 freight and passenger trains cross the border in Vainikkala carrying a freight of over 10 million tons yearly. A great deal (25-40 %) of that is transit via many Finnish harbours.

4.2 FIM 7.6 billions ro rails upgrading program in 15 years

As a part of Nordic Triangle, the Finnish rail network needs many structures renewals and safety systems. Also a new 58 km railways straight from Helsinki to Lahti has been designed. The link from Luumäki to Vainikkala needs a 34 km double track for demands of growing volumes and speeds.

The Finnish Railways have an estimate of future spendings to this railway modernization and the new tracks and lines. The really huge program rises in the 15 years period 1996-2010 up to FIM 7.6 billions.



The railway program of Nordic Triangle in Finland 1996-2010

5. ROADS

5.1 The E 18 road claims FIM 5.2 billions investment

The European trunk road E 18 runs from Oslo to St Peterburg and is an essential part of the Nordic Triangle eastwards extension. In Finland's territory, that connection has a legth of 350 km, of which only 92 kms have at the moment the technical standard level of a motorway.

The E 18 program in Finland comprises the construction of modern highway -mainly in motorway standard- within the years 1996-2010. The estimated cost of the program is about FIM 5. 25 billions.

5.2 Vyborg bypass and Petrozavodsk-Parikkala road wait on the Russian side

On the Russian side of the Finnish border, two important road connections wait for the realisation:
*The Vyborg northern bypass (27 km) with connections to Lappeeenranta and Imatra.
* The Petrozavodsk-Parikkala road connection (230 km).

The cost estimate for Vyborg bypass is 57,5 millions USD = 263 millions FIM and for Petrozavodsk-Parikkala 184 millions USD = 840 millions FIM. Obviousle an international financing is needed for these projects, which already are preliminary handled as DFBOT-cases in the Russian administration.

6. AIRPORTS

The Nordic Triangle program of Finland gives no major attention to airport improvment program because the capacity and technical equipment of the Helsinki-Vantaa Airport is very sufficient. At this main airport of Finland, a construction of third runway will be started in 1997, with a schedule of 5-6 years and a cost of about 500 millions FIM.

Some discussion has been rised of the need of a freight airport nearer the eastern border. There, the alternatives are lengthening of runways and widening the facilities either in Lappeenranta or Utti Airport. Both of these have to day only 2 kms runway length.

7. PIPELINES

Finland has since two decades a natural gas pipeline from Russia to southern Finland with a yearly capacity of over 3 billions cubic meters of gas. At the moment, this pipeline is to be widened with 50 kms of 80-90 cms diameter double pipe and some compression

stations construction by the Finnish natural gas company Gasum. Cost estimate of the program is FIM 500 millions. Future expansions westwards over the Gulf of Bothnia to connect the Russian-Finnish with the Scandinavian gas nets are discussed

8. CONCLUSIONS

The Finnish GOF-infrastructure project list comprises by traffic modes within the years 1996-2010 altogether following:

Harbours and waterways	3 000 millions FIM
Railways	7 600 millions FIM
Roads, E 18 in Finland	5 250 millions FIM
Airports and pipelines etc (rough estimate)	1 500 millions FIM
Whole program	17 350 millions FIM
Average yearly spending in 1996-2010	1 160 millions FIM
Additionally the connecting roads on Russian side	1 100 millions FIM

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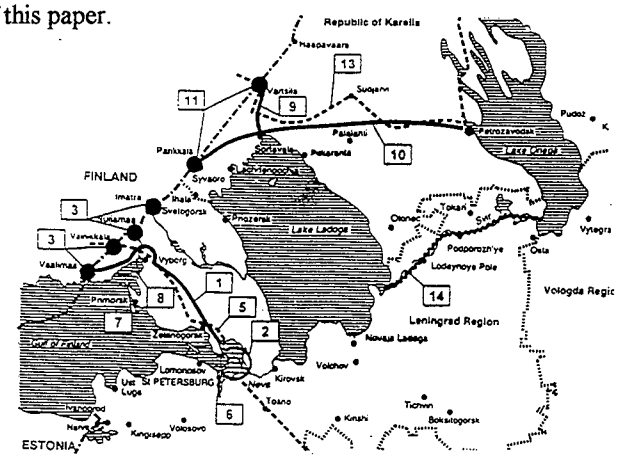

The Vyborg bypass and the Parikkala-Petrozavodsk motorway are two major road projects waiting on the Russian side of the FIN-RUS border

Infrastructure projects in Estonia

(by Mr. Aleksander Kaldas - Deputy Director General of the ERA)

Road transport.At present road transport makes about 72% from all passengers' and 52% from all goods' cargos of Estonian domestic economy. Shipping and airways keep the most part of the international connections. Due to certain political and economical reasons the technical and operational level of our railways is temporarily very low. That's the reason why the most essential part of the infrastructure projects belong to roadkeeping and road using area.

International transport corridors. The territory of Estonia is crossed by three international and one important domestic route. They are the next:
-European road E-20 (Estonian section Tallinn-Narva)
-European road E-67, part of Crete corridor No.1 , also called VIA BALTICA (Estonian section Tallinn-Pärnu-Ikla)
-so called VIA HANSEATICA route (Estonian section Jõhvi-Tartu- Valga)
-national main road Tallinn-Tartu, which connects the capital with the second biggest town in Estonia.Total length of above mentioned road sections is about 900 km.

Estonian national road network has total length 14992 km.Accordingly to the small countrry it is not so big,but quite dense.Density of the roads is 0,35 km per sq. km(national roads) and 1,01 km per sq. km (all the roads). By its classification the natonal road network is divided into main(1192km), basic(2665km) and local(11136km) roads.

Border crossings. The main roads of Estonia are connected with seven border crossing points(Tallinn, Narva, Ikla, Valga, Murati , Luhamaa and Koidula).Traffic volume is the biggest in Ikla. By the traffic data of the year 1995 the share of foreign transport in these points is different changing from 15% to 60% and depends on the dislocation

International infrastructure projects. There are seven remarkable national ifrastructure projects, which could be called international as well, as they either concern international transport corridors or could be classified as such by there character and volumes:
-Solution of the transport problems on Tallinn area and between Tallinn, Muuga and Paldiski ports;
-Reconstruction of Tallinn-Narva road;
-Construction of Narva by-pass;
-Reconstruction of Tallinn-Tartu road;
-Via Baltica;
-Via Hanseatica;
-Bridge to island of Saaremaa.

Road connection between the northern ports. Three important ports are dislocated on the north-west shore of Estonia.

-Tallinn old or City port, where mainly passenger transport is dominating;
-Tallinn new or Muuga port, which works for cargoes;
-Paldiski port which has low technical level and capacity at present, but is to be developped,as this port is free of ice during the most time of winter or even totally.
Part of the road network connecting the ports listed above includes a section of Tallinn-Narva road, whole Tallinn ringroad and Tallinn-Paldiski road completely. Narva road section close to Tallinn has been reconstracted into 2+2 lanes motorway. Its present technical status is satisfactory, except crossings with other public roads.Also the existing ringroad needs reconstruction works in certain points. Actually the new additional ringroad is required closer to city area. Present Tallinn-Paldiski road is the most inferior component of the road connection under discussion. Specially the final section of the road close to Paldiski has very light type of pavement and cannot meet traffic rquirements in springtime. Probably the last mentioned component will be reconstructed first of all in the next 2-3 years using own roadkeeping budget with expected PHARE-assistance.

Tallinn-Narva road. The road is classified as a public main road, which is identical to a part of European Road E - 20 and connects the capital with the frontier city Narva.It is an object of great interest for transit traffic through Estonia towards St.Petersbourg and farther to North-West Russia.
Reconstruction of this road to the one with 2+2 carriage-way has been going on relatively long time. The last project which was started after 1980 comes up to the settlement of Aaspere (approximately km78). Construction works are continuing extremely slowly due to lack of money for investments.
Temporarily the volume of transit traffic is unpretentious (about 600 vehicles per day on the average in border-crossing point of Narva). Assuming the contacts between West and East will develop, the road
is certainly required to be reconstructed up to Narva (approximately km210) with Narva by-pass and a new bridge over the Narva River. In its turn the improvement of traffic-conditions on the road is expected to make a favourable influence on development of the contacts mentioned above.

Narva by-pass could solve part of the present problems of border-crossing - narrow conditions in cheking points, heavy vehicles on city streets , average speed, etc. At the same time there are serious circumstances troubling to start with construction works immediately or in the nearest future, like:

-technical (a suitable solution for ~28km new road dislocated on the territories of two different countries
is required)
-financial (estimated costs are too high to cover them using existing sources for roadkeeping money)
-political (the pact about the border between Estonia and Russia is not signed by the proper sides)

Tallinn - Tartu road is the public main road between two biggest Estonian cities. The road has important role both for transit and for local traffic. Modernization of the road in according to the growing traffic has been started on the first 14-km section

from Tallinn in 1985. At present the section functions as motorway where the speed 110 km/h is allowed during sommertime.
The rest of the road section up to Tartu being constructed respectively the 3rd technical class of the former Soviet normatives needs reconstruction to the full extent as further rapid growth of traffic density is probable in the next 10 years. Just now the most essential technical problem is how to reconstruct the road - to modernize the existing one or to leave it for local traffic and build quite new speedway. The researches have been started and are going on to solve the new alignment of all the road in the next 2 years. Thereupon possible investors of 1,5...2 BEEK will be needed to realize the project.

Tallinn - Pärnu - Ikla road, also a main public road, is very closely connected with VIA BALTICA project from the rebirth of which now the ninth year is going on.
Via Baltica is a north - south transport corridor which provides a new link between North-East and Central Europe. It is an effective addition to the present connection via Denmark and Scandinavia.
In a restricted sense we speak about Via Baltica as an existing nearly 1000km long highway from Tallinn to Warsaw including ferry-connection over Gulf of Finland to Helsinki. As road E-67 it occupies really essential position in the European network. It is a matter of course that Via Baltica serves traffic in and between the Baltic countries as well.
Present traffic volumes on this section make from 2500 vehicles per day in the average to 4000 and even 10000 correspondingly near Pärnu and Tallinn. Neither city of Pärnu nor three small settlements on the route have any by-passes. Except these "bottlenecks" the existing road is able to meet above mentioned traffic needs today and during some next years assuming sufficient maintenance and repairs. Because of general economic situation road construction have been mainly stopped.
Today's problems have been connected in 3 points on the route - two cities and border-crossing with Latvia. City of Tallinn has old and narrow street network without any modern crossing or speedway.
To get through the city-centre and out of whole city area the construction of a new crossing with 2 viaducts and certain street sections will be taken into use next year. Also widening of the street dislocated in the very beginning of Via Baltica will be started.Design of another main street section near the harbour is going on. City of Pärnu has reconstructed the existing old bridge but needs construction of an access road to the new harbour and improvement of the ringroad. Ikla border-crossing point is under construction. Building of an up-to-date custom and border control station is going on.
Further works on the Via Baltica section are to be implemented up to 5-year investment plan submitted by the High Level International Working Party in 1995 correspondingly to the Memorandum of understanding signed by the countries involved (Poland, Lithuania, Latvia, Estonia, Finland).

Jõhvi-Tartu road could be spoken about as about a part of VIA HANSEATICA project. Preliminary study of this project has not been on the same level with VIA BALTICA. It is rather an idea at this time. The project connects southern shore of the Baltic Sea (Germany) with St.Petersburg (Russia) linking diagonally through the Baltic countries along the existing roads which need serious reconstruction and correspondingly remarkable investments to be used by transit traffic.

Present traffic density to the full extent of the route is quite modest. It means that profitableness of the needed reconstruction works can stay under suspicion during a long time.

Bridge to the Island of Saaremaa is the most beautiful and the most challenging one of the all infrastructure projects mentioned above. At present the islands (Muhu and Saaremaa) are separated from the continent by two sounds. The future road linking over the 8km-wide Big Sound by an assumed bridge instead of ferry-connection and then over the Small Sound by the existing sea-embankment, could bring essential benefits and changes into the economy and life-style of the islanders.
Technical side of the project is certainly complicated but quite feasible specially keeping in view good examples in Denmark and elsewhere in Europe. Unfortunately one cannot say the same regarding economical side as the estimate of the construction costs is really high compared even to the whole state budget. Still it has been decided to start with preparative investigations and researches right now in order to be ready for realization of the projct on commercial basis at well-founded moment (probably in 2010...2015).

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DEVELOPMENT PROJECTIONS FOR THE TRANSPORT SYSTEM OF ST. PETERSBURG AND NEIGHBOURING AREAS

1 EXTERNAL TRANSPORT SYSTEM

- 1.1 Sea and River Transport
- 1.2 Air Transport
- 1.3 Railways
- 1.4 Motorways

2 CITY TRANSPORT AND THOROUGHFARE SYSTEM

3 PROBLEMS OF THE CITY CENTER

DEVELOPMENT PROJECTIONS FOR TRANSPORT SYSTEM OF ST. PETERSBURG AND NEIGHBOURING AREAS

St. Petersburg is situated in the easternmost end of the Gulf of Finland, where the Neva River flows into it. The city center occupies a territory of 635 square kilometres. The city with administratively subordinate suburbs takes up 1472 square kilometres. The population numbers 4,8 million , including 4,3 million in the city center.

The good geographical location of this city is an important advantage for the creation of a major transport junction (including a system of seaports , the motorway between the Volga and the Baltic Sea, high speed railway commission with Moscow and the northern Europe, and international air terminal and speedways) in St. Petersburg and the neighbouring areas, linking Russia with the rest of Europe.

1 EXTERNAL TRANSPORT SYSTEM

1.1 Sea and River Transport

One of the top priority tasks in the development of St. Petersburg 's transport junction is the establishment of a large up-to date marine import and export complex, completed with an appropriate infrastructure. According to estimates, the freight turnover of the projected St. Petersburg Region's port complex may reach 120 to 150 million tonnes per year. Today, the St. Petersburg Seaport handles 12 million tons a year, the Vyborg Seaport processes 2,5 million tonnes, and the Vysotsk Seaport 1,5 million tonnes of cargo per year.

The highest priority is the enhancement of St. Petersburg's existing seaport in accordance with the projections built the city's general plan, envisaging the creation of new territories in the water landing area of the Gulf of Finland, west of the existing coastline. However, given St. Petersburg's limited railway access routes, its cargo turnover cannot be increased more than 2 to 2,5 times, i.e. up to 25-30 million tonnes a year. The limitations necessitate the construction of a large, new port, or several large new ports in this region. New ports may be built both on the southern coast of the Gulf of Finland, in the Luga Inlet (with an estimated cargo turnover of up to 35 million tonnes per year) or in the Batarcynaya Harbour (15 million tonnes per year), and the northern coast, in the Primorsk area, near Vyborg (45 million tons a year).

In addition, it is potentially possible to deploy marine freight terminals in St. Petersburg's nearest suburbs, including the areas adjacent to the Flood Barrier Complex (FBC). The cargo turnover of such terminals would total 20 to 25 million tonnes per year.

The current freight turnover St. Petersburg's river transport totals about 12 million tonnes per year. It may increase by twofold within the next 15 years if the existing freight handling facilities will be reconstructed, and new ones will be built next to the FBC.

1.2 Air Transport

The aerial gateway to the city is the Pulkovo airport, which is located in close proximity to the city. The location is very convenient for air travellers (a bus ride to nearest Metro station takes only 15 minutes), but creates problems for the residents of nearby neighbourhoods because of aircraft noise. Compared to large cities abroad, the passenger turnover of the Pulkovo Airport is very modest: no more than 5 or 6 million passengers per year. The airport links St. Petersburg to 33 cities world-wide. There is no reason to expect any substantial increase (twofold growth is the limit) in Pulkovo Airports productivity, as a more radical increase would result in higher noise pressure in the nearby residential communities.

The development of the city's second airport (local airlines), located east of the city, in the Rzhevka area, is subject to same kind of restrictions. Bearing that in mind, the draft general city development plan pinpoints two suitable out-of-town sites for the construction of a new international-class airport: the Tosno area (70 km from the city), and the Izhora area, 30 kilometres from the city, on the southern coast of the Gulf of Finland.

1.3 Railways

Seven outside mainline railways join at the St. Petersburg railway junction. In addition the city has multiple commuter railways connecting it with the maritime communities on the coast of the Gulf and Lake Ladoga. The city's five railway stations serve 215 million outbound travellers per year, including one million long distance travellers.
A project is currently underway, and construction has commenced on a high-speed mainline railway from Moscow to St. Petersburg. The project length of the new mainline railway is 645 kilometres. It will take 2,5 hours to get to St. Petersburg from Moscow. Regrettably, neither the design, nor the construction pattern of the new railway takes into account its subsequent integration into system of high-speed railways spanning to Russia and Europe, which includes the Helsinki- St. Petersburg-Moscow- South of Russia (Black Sea) railway. The penetration of this railway deep into the city to Moscow Station will take a very serious reconstructional effort, a part of which includes effective protection of nearby buildings against the noise impact. One of the priorities here is the construction of a new Ladozhky Station in the right-bank part of the city in order to alleviate palpably the workload of the Moscow and Finland Stations.

The development of the railway junction with an emphasis on freight carriage is to provide suitable options for relocating cargo handling and sorting operations to areas

lying outside of the city limits , as well as reroute transit cargo flows around the city. The construction of several new out-of-town sorting stations, and railway detour around the city from the east is planned for that purpose, which is a major problem in its own right for the St. Petersburg Region.

1.4 Motorways

The structural core of the region's system of motorways is made up of the five existing radial national highways-the Vyborg highway, the St. Petersburg-Murmansk highway, the Moscow highway, the St.Petersburg-Kiev-Odessa highway and the Tallinn highway - and the projected St. Petersburg- Kirishi- Yaroslavl highway. All these motorways will be linked together by the ring road to be built around St. Petersburg.

The feasibility study for the ring road has been recently completed. The 150- kilometre ring road will be aligned within the space between St. Petersburg and the ring of satellite cities (Krasnoye Selo, Pushkin , Kolpino, Vsevolozhsk and Sestroretsk) The western segment of the ring road will be aligned on top of the FBC dam now under construction, across the Gulf of Finland. Its eastern part will be rooted via a "communicational corridor" across restricted access areas. The time frame for the construction of the ring road has not been defined yet. Obviously, the ring road will be built end brought into operation by phases. Very likely, the first phase to be build will be the section across the dam between the Vyborg and Tallinn highways.

2 CITY TRANSPORT AND THOROUGHFARE SYSTEM

The vital task is to ensure that the motorway system of St. Petersburg and the neighbouring areas is interconnected and conducive to curbing the adverse impact of vehicles on the environment. The general plan of the city calls for the creation of a system of transit or "regional" routes criss-crossing the body of the city within shared transport corridors with meridinal and latitudinal railway lines with access to peripheral motorways. The total length of these regional thoroughfares within the St. Petersburg city limit will be about 200 kilometres.

Now that St. Petersburg has placed its bid hosting the Olympics, a feasibility study is underway for " The Western High-Speed Diametrical Route", a motorway crossing the city from north to south, spanning all Olympic facilities. This route is integrated into the future regional thoroughfare network.

St. Petersburg's traditional inner-city street and road structure in its present state leaves much to be desired. Its imperfections are manifested most strikingly in the huge amount of transit traffic, including heavy-duty vehicles, passing through the city center due to the lack of detours, causing heavy congestion on some of the city's key streets and bridges across the Neva. In accordance with the general city plans, construction has long ago started on a detour around the city's central districts. According to analysts, when the detour route is completed and some advanced traffic regulation

technology is installed, an estimated 25 to 30 % of the heavy traffic and up to 15 % of the automobiles now passing through the city center will be re-routed away from it. This will greatly improve the centres environmental situation and make driving generally safer in the center, where more than half of all traffic accidents take place today, although the central districts occupy less than 10% of the city's area.

The problems related to the structuring and safety of city traffic have become much more acute over the last five years due to an incredibly rapid growth in the number of personal vehicles in the streets. In 1992 alone, the number of cars in the city increased from 65 to 150 cars per 1000 residents, or more than doubled. The number of cars may be expected to reach as many as 250 per 1000 residents by 2010. The adverse consequences of this process become obvious enough if we look at the largest Western cities. These consequences include traffic jams, lack of parking space (especially in the center), and environmental problems. It is, therefore, exceedingly important to prioritise public rather than private transport, ensuring a high level of comfort and efficiency of the former.

The aggressive expansion of the city into new territories that has taken place for 30 years before it was halted in 1990, whereby multi-storey residential complexes rose to the periphery. While most employers stayed within the city center and surrounding industrial belt, this brought about a considerable increase in commuting distances and the inward flows of morning traffic. Under these circumstances, the underground railway (the Metro) was intended to become the leading means of municipal transport. The full-scale use of the Metro in this capacity was held back only by the slower expansion of its network compared to the tempo of residential development. Nevertheless, from 1966 through 1990, St. Petersburg's transport infrastructure was developing along the lines envisaged by general city plan and the comprehensive public transport development schedule worked out on its basis, albeit at a slower rate than was stipulated by these documents. Over the past five years, the level of public transport services have been steadily on the decline as part of the overall economic crisis.

Currently, all types of municipal transport in St. Petersburg carry a total of approximately 4 billion passengers per year, 86% of passengers travel by the four leading means of municipal transport, including the Metro (28%), trams (20%), trolley buses (13%), and buses (25%). 10% of residents travel by automobile; above-ground railways within the city account for 2% of the total, and the other means of inner city transport (river boats, service buses and fixed-route taxis) carry the remaining 2% of the total number of passengers. The Metros share in terms of workload (passengers per kilometre) is 60% of the city's four main types of transport.

The four existing Metro lines are 92 kilometres long on aggregate. The city's Metro has 54 stations and 6 inter- line transfer junctions.

The total length of the above-ground public transport routes is 1370 kilometres, including tram tracks- 300 km, trolley lines -345 km and bus routes 725 km.

The guidelines for the development of St. Petersburg's transport are set out in the general city plan. According to the city's development concept, the priority in passenger carriage is given to municipal public, not private, transport. Every means of transport is assigned a special role to play as part of the overall passenger carriage infrastructure of the city and the suburban areas.

Structurally, the system is supposed to heavily rely on high-speed railway types of transportation, such as the Metro, which is to bind all city districts with its center and with each other, and the above-ground railway lines, ensuring the passage of trains through the city and connecting it with the suburbs. The high-speed railway means of transport will be providing passenger carriage cervices for distances of 5 km or more. In order to ensure adequate high-speed railway service of St. Petersburg's territory, the Metro network must comprise a minimum of six diametrical lines converging in the city center. In the future, the total length of Metro lines must increase more than twofold, reaching 215 kilometres.

The existing system of settlement and recreation in St. Petersburg's suburban areas does not require new railway lines. The main task is to enhance the throughput of the existing lines by building new tracks and tightening the train timetable. The creation of transferfree commuter routes is being held back by the dead-end-based pattern of the St. Petersburg railway junction with its five deep cuts into the city going all the way to the center. During the first phase these cuts may be linked together to form a consolidated system by reconstructing the city's existing semicircular railway route to make it suitable for electric trains with access to direct outward lines going in different directions. Later on, a diametrical through-railway may be built in a tunnel running deep under the city center, spanning the Moscow and Finland routes.

Above-ground public transport is to play a consistent role with its carriage capabilities and velocity. The tram, having the most capacity of the above-ground means of transport, is to service the connection between the city's physically adjacent neighbourhoods and between the closest of these neighbourhoods and center, with distances serviced ranging from 3 to 4 km. Express-timetable tram lines are planned for certain routes not served by the Metro.

As the Metro network grows, the bus and the trolley bus are increasingly playing the role of a means of transport to take the passengers to the nearest Metro station. They also provide carriage services within individual city districts, covering distances from 2 to 3 km.

3 PROBLEMS OF THE CITY CENTER

In spite of the fact that the development plans for St. Petersburg's public transport system has been worked out in detail, we must admit that the current economic crisis has caused certain constrains in the budget appropriations for the maintenance and development of the city works. As a result, Metro construction has slowed down drastically , while above-ground transport system has begun to disintegrate, primarily

because of its lack of rolling stock. As the scope of public transport operations diminishes from year to year, not only is the number of private cars increasing, but they are being increasingly used for trips to work or on business. This tendency is making itself felt particularly strongly on the narrow central streets, which are virtually packed with cars both moving and parked in driveways and on sidewalks, and pedestrians who would walk one or more bus stops rather than wait for public transport to arrive.

Given this situation, the solution of the transport problems in downtown St. Petersburg requires, alongside the aforesaid measures to reroute transit traffic flows away from the city center, a dedicated effort in a bid to normalise the operations of the above-ground public transport, and accelerated construction of the Metro lines connecting the downtown and the new residential communities. However, the St. Petersburg city hall's recent policy has been aimed at a further curtailment of public transport operations in the center by dismantling tram tracks on streets and bridges across the Neva. These measures are designed to increase the automobile throughput capability of central streets, and rely on the example of some other large world cities including Moscow, where hardly any trams run in the center. In doing so, the authorities fail to take into account the following:

- the density of Metro lines in downtown Moscow is 1,5 times higher than the density of tram tracks in downtown St. Petersburg, while the number of Metro stations there reaches 2.2 per square kilometre, which is 5 times more than in St. Petersburg;

- the experience of overseas cities shows that any increase in motorway throughput capability, especially at points where they flow into the downtown area, gives an additional impetus for a further increase in the influx of automobiles , resulting in another crisis 2 or 3 years later.

The structuring of downtown traffic in St. Petersburg may only be carried out successfully if a comprehensive package of measures is implemented including restrictions on automobile access, a rerouting of transit traffic, improved public transport operations, stricter parking regulations and, in the long run, more aggressive utilisation of underground space (for traffic tunnels, parking lots, etc.)

Overall, one can't help but admitting that the state of St. Petersburg's transport system has drastically deteriorated over the last three years, qualifying as "critical" at the moment. We have no right to ignore the lessons that major overseas cities have to teach us with respect to the development of transport infrastructure. Apparently, it is about time to study them in greater detail with a special focus on the coexistence patterns of public and private means of transport (park and ride, etc.), imposing limitations on the inflow of automobiles at approaches to a city, and at the city's historical center.

Figures taken from the publication:
A study on the Transport Infrastructure of St. Petersburg and the Leningrad Region 1993. Ministry of Transport and Communications of Finland

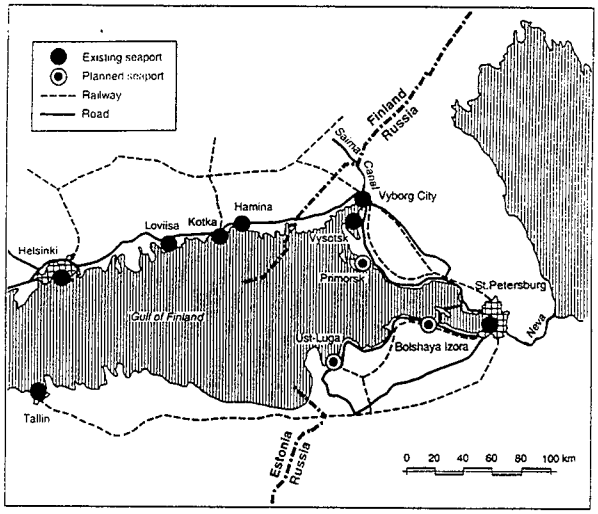


Fig. 1-7.4 Existing and planned sea ports in the Gulf of Finland

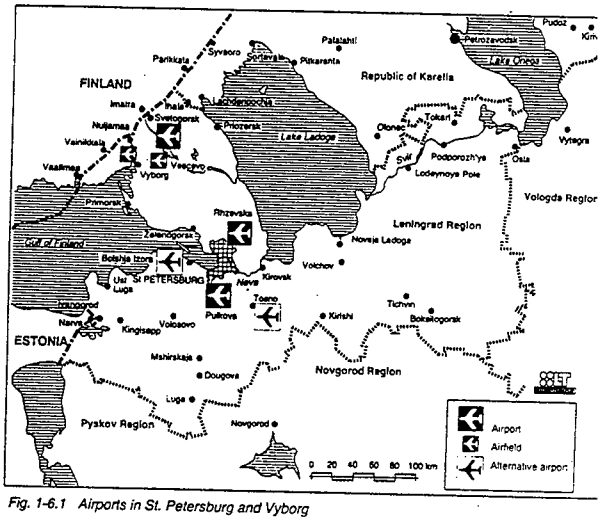


Fig. 1-6.1 Airports in St. Petersburg and Vyborg

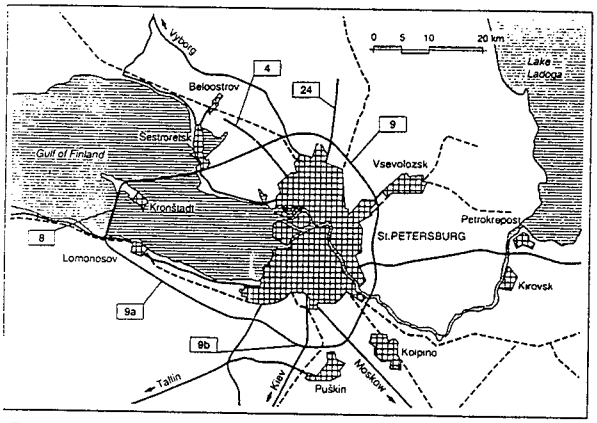


Fig. 5-4.1 St. Petersburg outer ring road

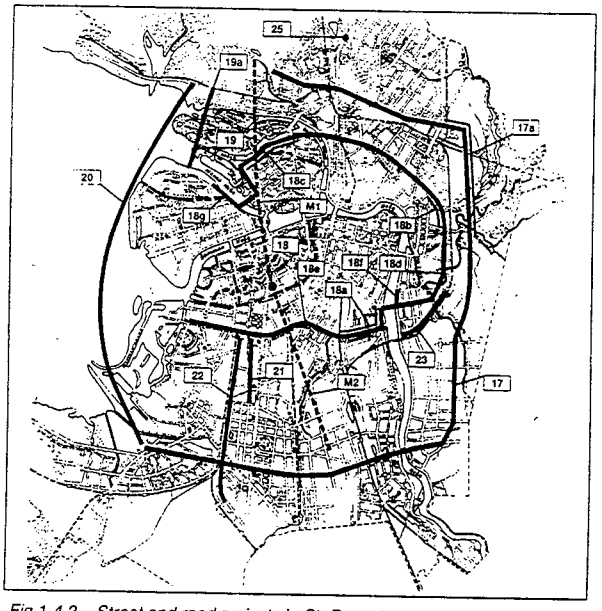


Fig.1-4.2 Street and road projects in St. Petersburg

French experiences of cross-border transport cooperation
A few examples from the French, German and Swiss region of the Upper Rhine
(by Dr. Dominique RITZ, Direction Régionale de l'Equipement d'Alsace)

A few recalls about the notion of cross -border cooperation and the intervention-framework of French authorities in this domain

Before presenting a few French examples in cross-border transport cooperation with Germany and Switzerland and more particularly between Alsace in France, the region of Baden and the South of Rheinland Pfalz in Germany, and the cantons of Basel in Switzerland, territories which form the region of the Upper Rhine, it is worth coming back at first and shortly on the notion of cross-border cooperation and the intervention-framework of the French authorities in this domain.

The cross-border cooperation has above all a local nature and has been intended for a long time to sort out neighbourhood problems which could appear in such a field as environment or the movements of goods and people. In particular with the European construction, the field of cross-border cooperation has been made wider and it becomes a means for the populations along the border to improve the quality of their relationships and to carry out on the local level initiatives which answer best their needs. In this situation, France, Germany and Switzerland enter in 1975 into an agreement (agreement of Bonn) which instutionnalizes the cross-border cooperation in the region of the Upper Rhine.

In France, the cross-border cooperation until the eighties was entirely in the hands of the state. As regards local problems, it was the regional prefect, who represents the state in the region, who was responsible for controlling the cross-border cooperation with the assistance of the local technical departments of the concerned ministries such as the Direction Régionale de l'Equipement (regional departement of the ministery of infrastructures and transport).

It should be noted that the laws which have been organizing since 1982 the competences transfert between state and local public authorities (municipalities, departements and regions) have given these local public authorities progressively the options of developing cooperation with their counterparts on the other side of the border in the framework of their competences. In this situation, France has been removing since January 1994 its declaration made in the framework of the Council of Europe (Madrid agreement) which bound the cross-border cooperation between local public authorities to an intergovernmental consent. Very recently the law of the 4th of February 1995 authorizes the local public authorities in the regions along borders to take part in cross-border public bodies which provide public services or realize an indispensable equipment for the local life. This law leads France to sign with Germany, Switzerland and Luxembourg a new agreement in Karlsruhe the 2nd of January 1996 which works out the pratical details of the cross-border cooperation between local public authorities on each side of the border. Thus, today, the departments of the state see their missions in cross -border cooperation to be reduced to verify that the cooperation between local public authorities does not damage the interests of the nation or is contrary to the French international obligations.

The fact that today in France local public authorities have real competences in the cooperation field has a particular importance in the transport of passengers owing to their major roles in this domain: the region is now competent in regional public transport by rail, the departement is competent in secondary roads and in local public transport by bus and the

municipality is competent in urban public transport. Certainly, the state keeps an important role and more particularly for national roads, rail infrastructures, or for the regulation of the transport field in general but its action on the local level is henceforth subsidiary and it is carried out in the framework of an partnership with the local public authorities.

The region of the Upper Rhine: the cross-border reality

As we have seen, the region of the Upper Rhine is a geographical teritory which groups together in France the Alsace, in Germany the region of Baden in the land of Baden-Württemberg and the region of Süd Rheinland Pfalz in the land of Rheinland-Pfalz and in Switzerland the cantons of Basel.

This territory is a privileged space for cooperation because of the fact that the cross-border reality is important in the life of many thousand people.

Some examples allow to illustrate this.

- the always growing number of German and Swiss families which are living in Alsace. This number exceede on some parts of the Alsace territory 5% of the local population;

- the very important part of persons from Alsace who work across the border (about 25 000 in Germany and about 30 000 in Switzerland). The influx of workers in the opposite direction is still relatively small but is increasing continuously;

- the high and always growing level of the cross-border traffic.

A cross-border cooperation which is in line with a particular institutional context

The cross-border reality in the region of the Upper Rhine has led progressively to an adapted intitutional framework.

After the reconciliation of France with Gernamy at the end of the second world war and with the construction of Europe, several initiatives have been taken in order to create the conditions for a better cross-border cooperation. They were in line with the legislative context which was previously described.

Until 1975, several local bodies of cooperation such as "Regio Basiliensis" or "Regio du Haut-Rhin" were born in the region of the Upper Rhine but they were without real powers.

The Bonn agreement between France, Germany and Switzerland in 1975 set up:

- an intergovermental commission for neighbourhoud-questions. It holds a meeting about once every three years;

- bi- and tripartite local committees which became in november 1991 the Conference of the Upper Rhine. This institution makes suggestions to improve the cross-border cooperation. In the Conference each country is represented by a

delegation under the supervision of a political local authority (regional Prefect in France, "Regierungspräsident" in Germany, cantonal delegate in Switzerland).

Today, it is at first in the framework of the Conference that initiatives are taken in order to develop the cross-border cooperation. The Conference holds a meeting twice a year and has workgroups which are in charge of preparing its work, of making the rapprochement of people and mentalities easier and of making proposals to get ahead with cooperation.

The transport field is without any doubt the most active domain of the cooperation because of its place in the cross-border reality.

In this context it is also important to note the essential role that plays the European program Interreg. In particular, it has permitted and permits still to carry out actions and studies which could not exist without this source of financing.

A few examples of cross-border cooperation in the transport domain

In the transport domain it must be emphasized that the cross-border cooperation concerns at the same time the improvement of road infrastructure, the development of public transport, the promotion of the combined transport (intermodal transport for which inland journeys are mainly on rail and waterways and initial and/or final legs are done on road), the airports development, or still the transport of hazardous materials.

Some examples can be presented here to illustrate this.

Road infrastructure

-the conversion of the german national highway number 9 (Bundesstrasse 9) between the villages of Kandel (D) and Lauterbourg (F) into motorway. This conversion which garantees the continuity of motorway between the North of Alsace and the South of Rheinlan-Pfalz should ensure a better quality of the motorway network in the Upper Rhine region and make easier the transport of people and foods. It is described in the national German programm for transport infrastructure (Bundesverkehrswegeplan) as "first priority" and should be completed in the year 2002.

- building of a new bridge of 450 meters over the Rhine at the South of Strasbourg between the two villages of Eschau (F) and Altenheim (D). This bridge should make the traffic between France and German easier in the region of Strasbourg. The building should begin very soon because the necessary intergovernemental agreement has been signed last April and the financing is available (overall cost 270 millions of francs, with 140 millions paid at parity by France (state, region, department) and Germany (State and region) only for the bridge).

- building of the " North tangent of Basel ", motorway section that bypasses Basel and designed to ensure continuity with the French motorway A35 and to avoid that the transit traffic crosses the town of Basel. The building is under way and should be completed in the year 2007.

Transport of passengers by rail

- Métro-Rhin. It is a cross-border train which has been linking since 1989 Strasbourg (F) to Offenburg (D) with seven round trips by day and for which the operating costs are supported by the Alsace-region and the land of Baden-Württemberg in proportion of the running kilometers in each country. This local train is intended to make the local journeys easier, in particular of the persons who work across the border, and to reinforce the integration of the offers of transport by rail which are made on each side of the border.

- Regio-S-Bahn. It is a cross-border train which should link with four round trips by day the towns of Mulhouse (F), Basel (CH) and Frick (CH) without having to change of train in Basel. Intended to persons who work across the border in Alsace, it should be operational in May 1997. Its operating costs will be supported according to the same principle as in the case of Métro-Rhin.

- Reopening of the rail link between the two towns of Winden (D) and Wissembourg (F). The next 2nd March should be reopened this rail link intended to persons in the North of Alsace who work across the border in Germany. Its operating costs will be supported by the land of Rheinland-Pfalz.

- Euro-Rhin. It is a concept of cross-border train which should link in the future the main towns of the region of the Upper Rhine (Karlsruhe (D), Strasbourg (F), Colmar (F), Mulhouse (F), Basel (CH) and Freiburg i. Br. (D)). This concept was the subject, in the framework of the european program Interreg, of a faisability study and of a passengers potential study. This latest study, completed last June, has allowed to analyse several scenarii of the development of transport by rail and their consequences to the dividing up among the different modes of transport by using a disintegrated model of people movings. This study draws the conclusions that it is interesting to carry out partially the concept between the towns of Strasbourg and Freiburg. This point will be discussed at the Conference of the Upper Rhine in June 97.

Combined transport

- reflections under way on the possible actions to promote in a cross-border framework the development of the combined transport such as multisite terminals on the cross-border territories of Karlsruhe (D)/Wörth (D)/ Lauterbourg (F), Strasbourg (F)/ Kehl (D)/ Offenburg (D), and Mulhouse (F)/Weil am Rhein (D)/ Basel (CH) or as the development of the cross-border customers for the existing terminals in the region of the Upper Rhine.

Air transport

- Euroairport Mulhouse-Basel-Freiburg. It is probably one of the most accomplished achievement in the cross-border cooperation in the region of the Upper Rhine. This airport which has been set up by a bilateral convention between France and Switzerland in 1962 is today a real cross border instrument of development, used by French people as much as German people or Swiss people.

It is the seventh French airport by the number of its passengers and its prospects of development are important (more than 4 millions of passengers in 2010).

Transport of hazardous materials

- informations brochure for the lorry drivers who transport hazardous materials. This brochure of four pages written both in German and French is intended to inform the lorry drivers who work in the region of the Upper Rhine about the complementary rules to the international rules for hazardous materials transport (ADR) of each country own.

The cross-border cooperation: sometimes a difficult cooperation with several reverses

The cross-border cooperation in the region of the Upper Rhine is sometimes a difficult cooperation with sevreal reverses. The variety of cultures, experiences, sensibilities makes sometimes difficult the emergence of the necessary consensus. Still today, in spite of a long pratical in the cooperation field, the cross-border cooperation in the region of the Upper Rhine is sometimes stopped by a narrow perception of the common interest which does not cross the border.

Two examples allow to illustrate this comment.

Transport by rail

The practical details of the appropriation of the operating costs of some projects lead each country to support the operating costs in proportion of the running kilometers on its territory. The absence of an homogeneous dividing up of the customers can lead in this conditions to serious financial imbalances on one side of the border which, because of the fact that the project does not concern only the population of the land, can lead to stopp the project. This is at the present time what is more or less happening with Métro-Rhin for which the permanence is no more garanteed on the French borderside because of its low number of customers and its operating deficit (1,9 millions of francs by year). The same problem occurs in the Euro-Rhin project.

Air transport

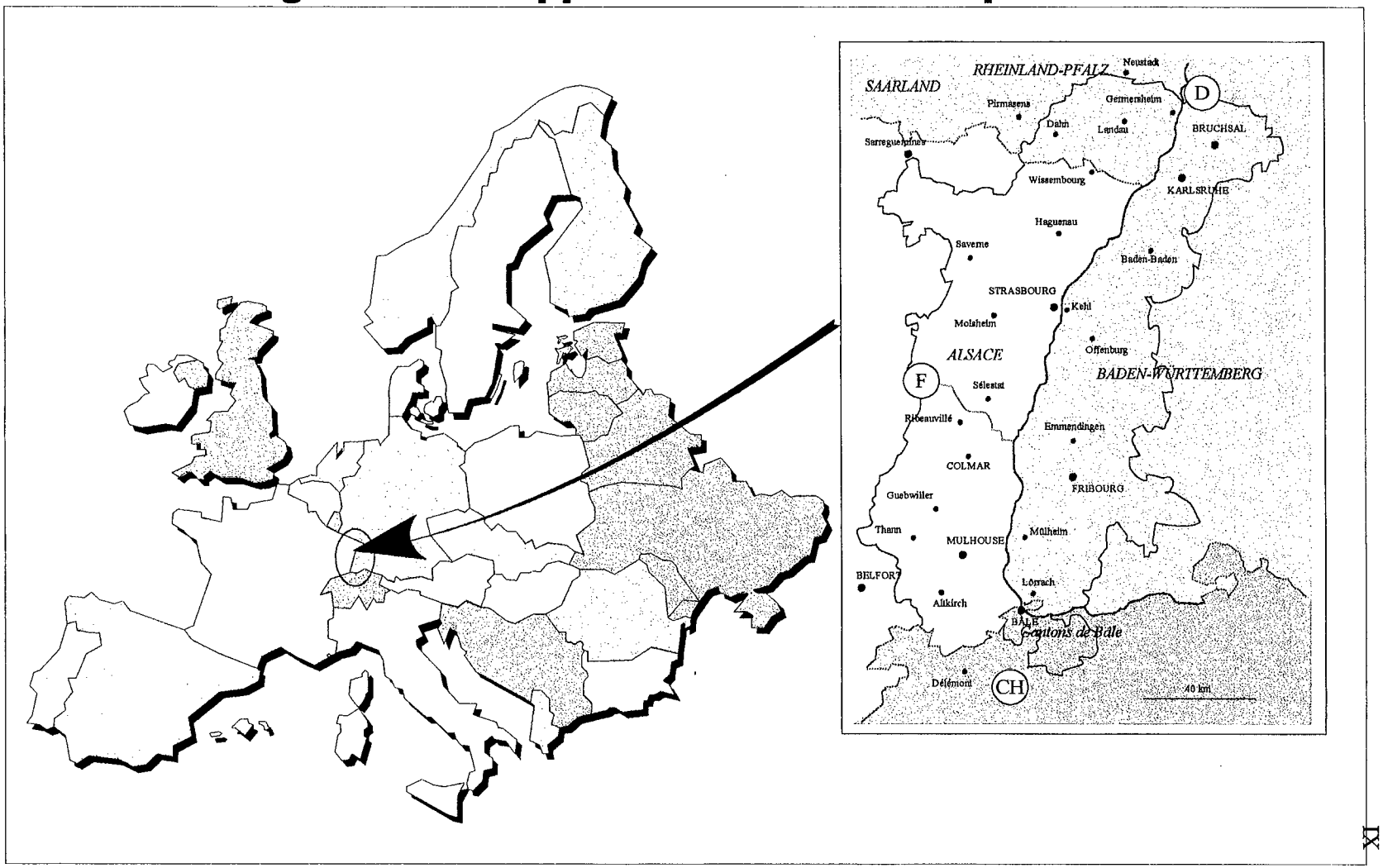
The opportunity that the commercial use of the former NATO airport of Söllingen meant for the local development has persuaded German authorities to convert into a comercial airport this former military airport. But Söllingen is 40 kilometres far from the airport of Strasbourg-Entzheim (which has been existing for more than 20 years and is already binational in its operating) and will have almost the same catchment area of customers as Strasbourg-Entzheim.

The cross-border cooperation: a necessity for the future

Whatever happens in the current cross-border cooperation, it is an absolute nessecity that cannot be ignored from the moment that a cross-border reality exists in the life of an important part of the population.

The building of Europe and more generally the desire of each person to live in harmony with its neighbour make of the cooperation an imperative. Even if the cooperation meets reverses, even if the results are not always immediate and are not a step in the hoped direction, it is necessary to persevere in this process in particular by creating the right organization of cooperation in which the persons will learn progressively to know and to respect their border neighbours and at the end conceive a cross border common interest.

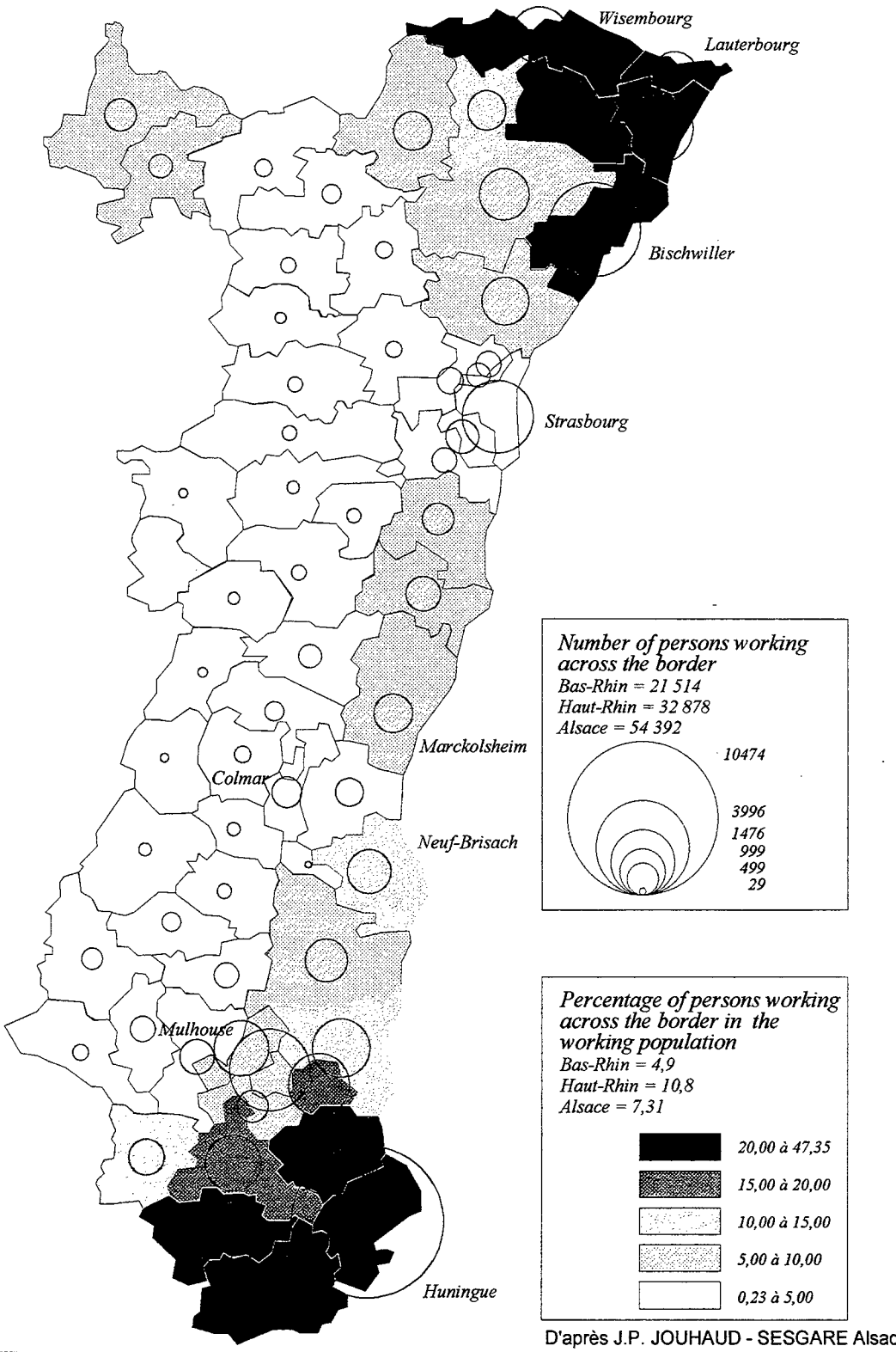
The region of the Upper Rhine in the European context



DRE Alsace- Division Economie des Transports

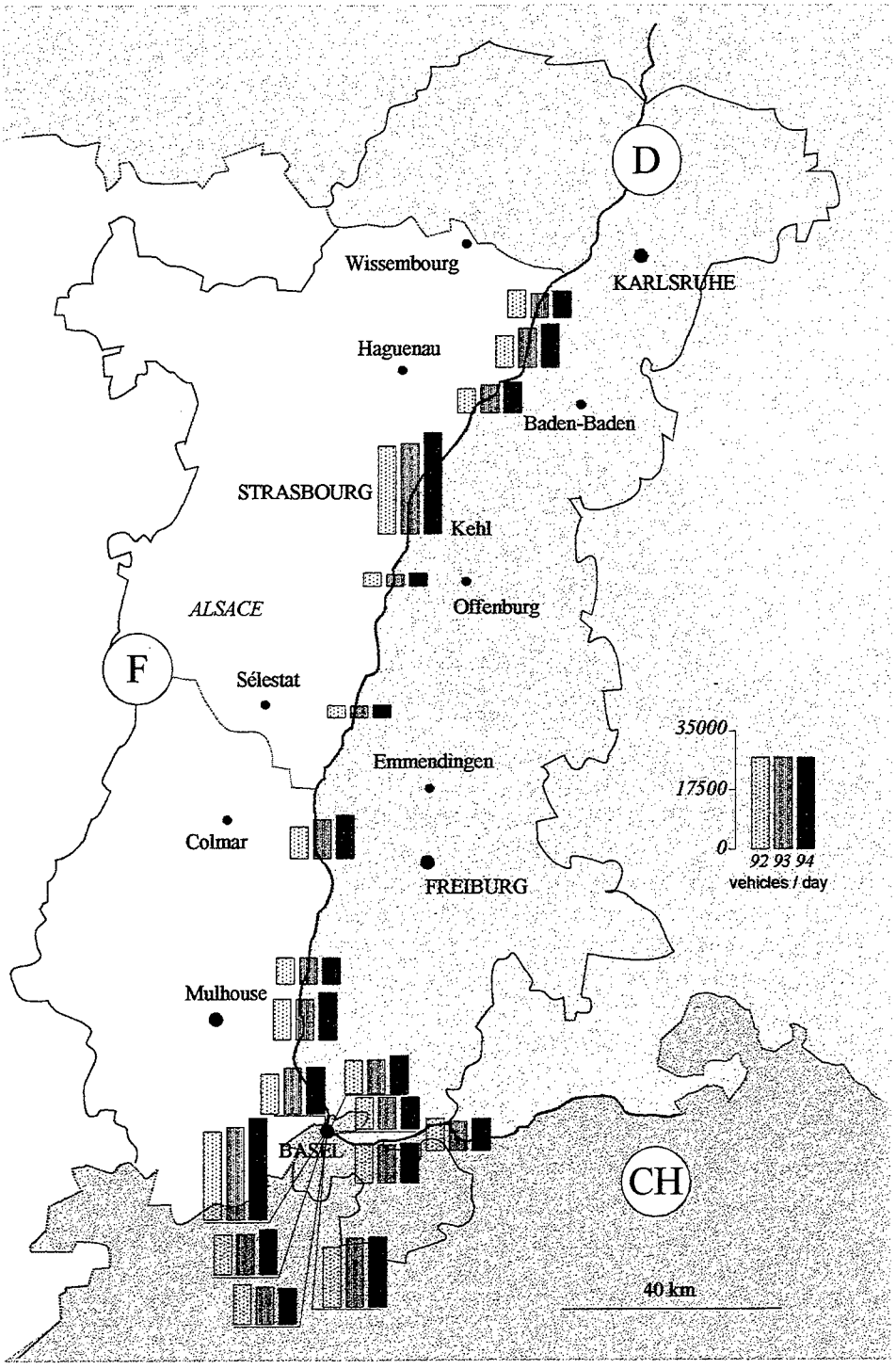
IX

Persons who work across the border in Alsace in 1990

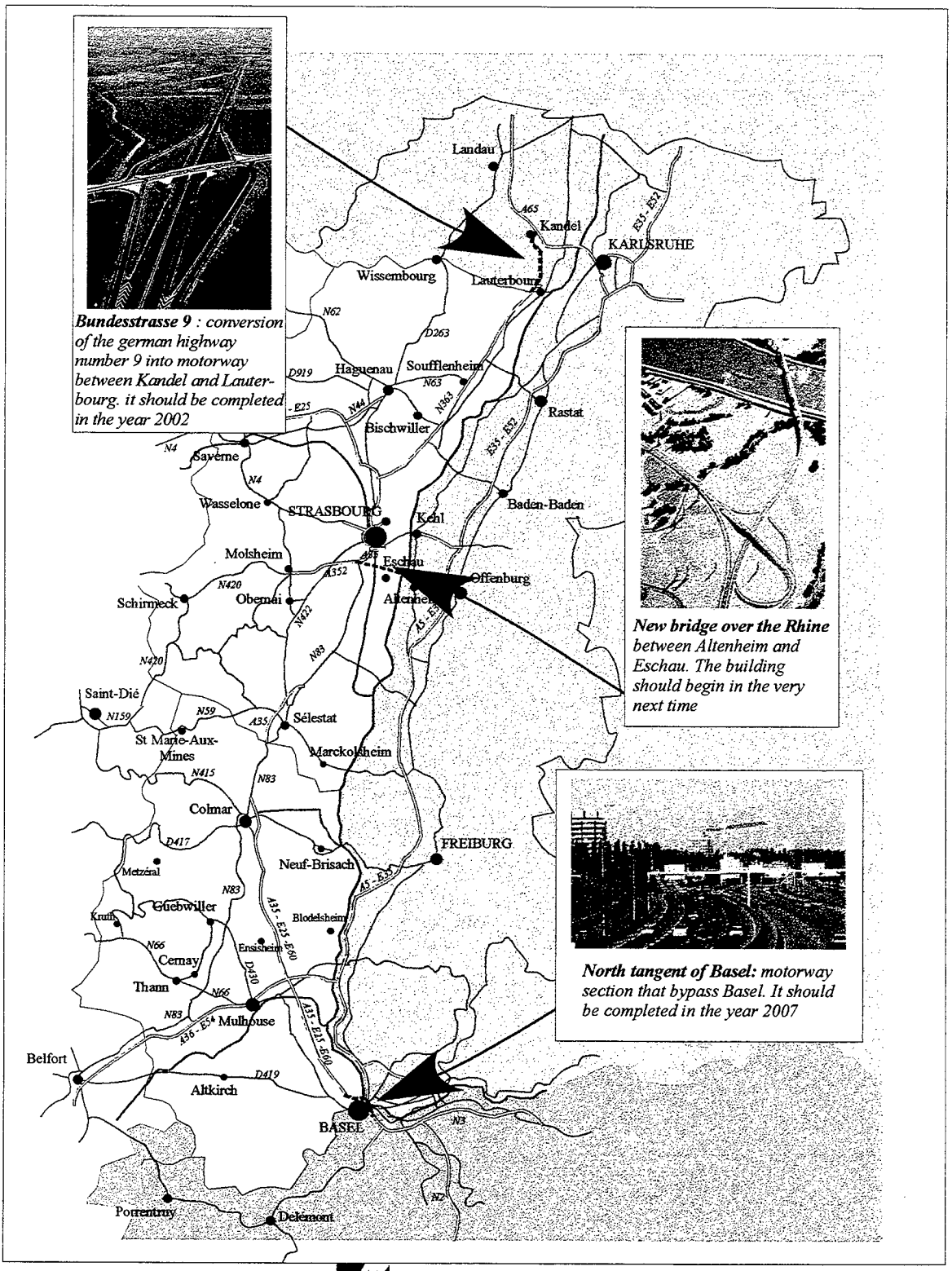


D'après J.P. JOUHAUD - SESGARE Alsace

Cross-border traffic in the region of the Upper Rhine



Croos-border road projects in the region of the Upper Rhine



Bundesstrasse 9 *: conversion of the german highway number 9 into motorway between Kandel and Lauterbourg. it should be completed in the year 2002*

New bridge over the Rhine *between Altenheim and Eschau. The building should begin in the very next time*

North tangent of Basel: *motorway section that bypass Basel. It should be completed in the year 2007*

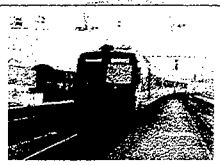
DRE Alsace- Division Economie des Transports

Cross-border rail projects in the region of the Upper Rhine

Reopening of the rail link between Winden and Wissembourg. It should be operational in May 1997

***Euro-Rhin:** concept of cross-border train which should link in the future the main towns of the Upper Rhine. It is still under consideration.*

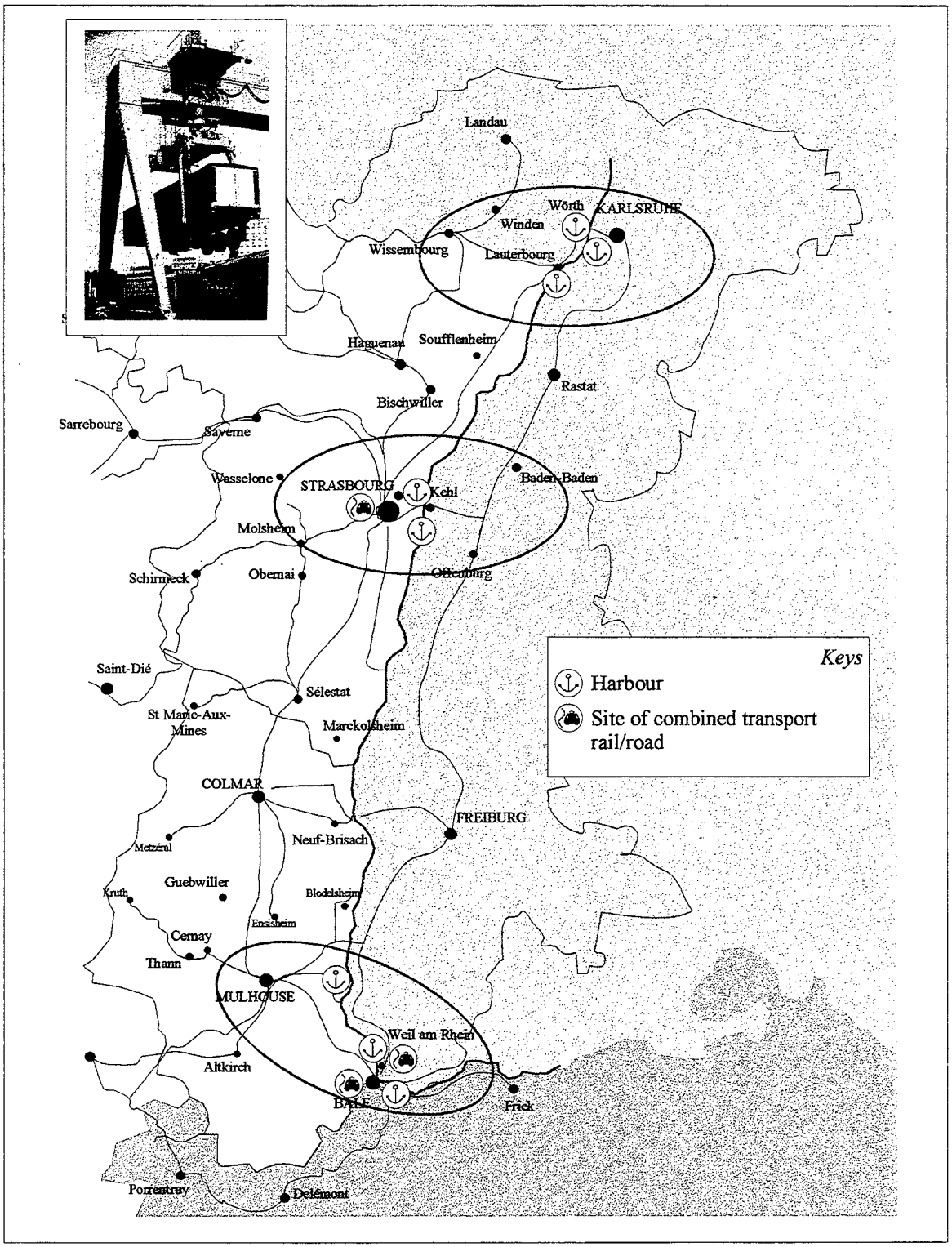
***Métro-Rhin:** Cross-border train linking since Mai 1989 Strasbourg to Offenburg with 7 round trips/day*



***Regio-S-Bahn :**Cross-border train which should link from May 1997 the towns of Mulhouse, Basel and Frick with 4 round trips/day*

Landau
Wörth
KARLSRUHE
Winden
Bitche
Wissembourg
Lauterbourg
Sarre-Union
Haguenau
Soufflenheim
Bischwiller
Sarrebourg
Saverne
Wasselone
STRASBOURG
Kehl
Baden-Baden
Molsheim
Schirmeck
Obernai
Offenburg
Saint-Dié
Sélestat
St Marie-Aux-Mines
Marckolsheim
COLMAR
FREIBURG
Neuf-Brisach
Metzéral
Guebwiller
Kruth
Blodelsheim
Ensisheim
Cernay
Thann
MULHOUSE
Altkirch
BALE
Frick
Porrentruy
Delémont

Potential cross-border areas for the development of combined transport in the Upper Rhine



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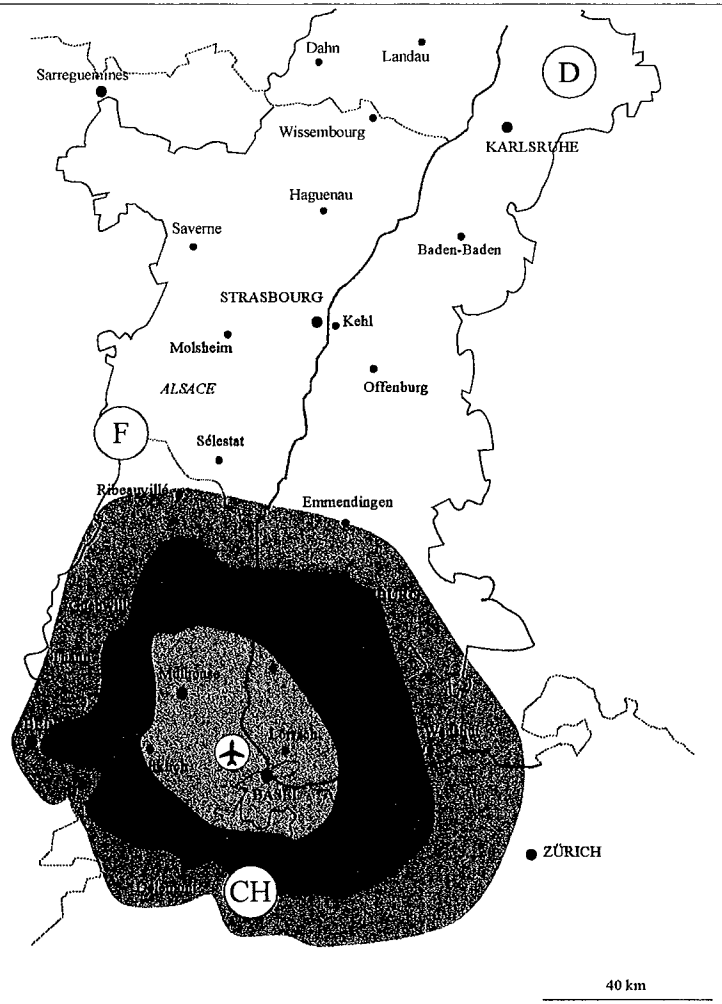
Catchment area of customers of the airport of Basel-Mulhouse



Accessibility of the airport	
Isochrone	*Served population (thousand)*
30'	*527*
45'	*909*
60'	*1178*
90'	*2385*

Progression of the passengers number	
1990	*1 845 202*
1991	*1 856 597*
1992	*2 002 907*
1993	*2 046 790*
1994	*2 159 624*
1995	*2 357 857*

Keys

catchment area at 30'

catchment area at 45'

catchment area at 60'

catchment area at 90'

Sources: ITA

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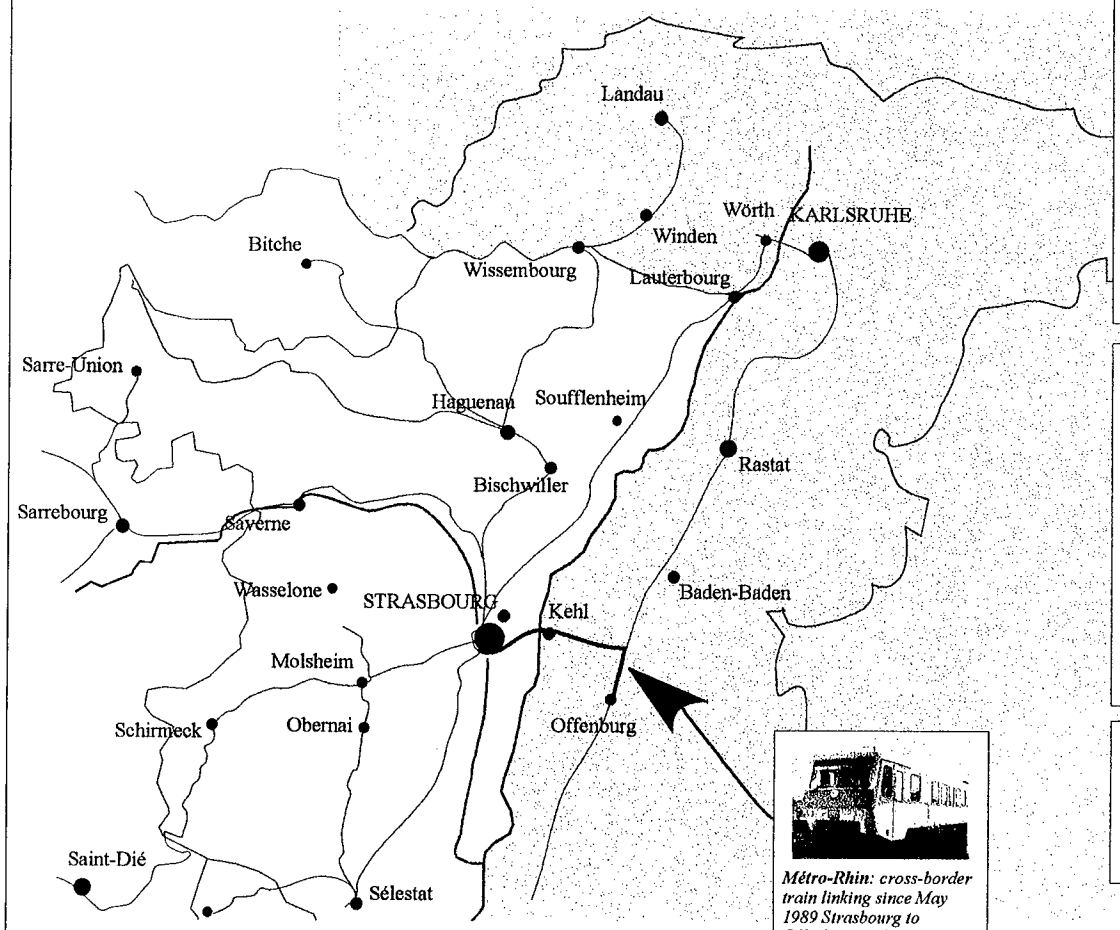
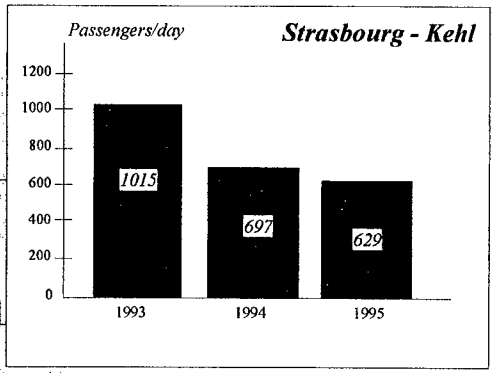
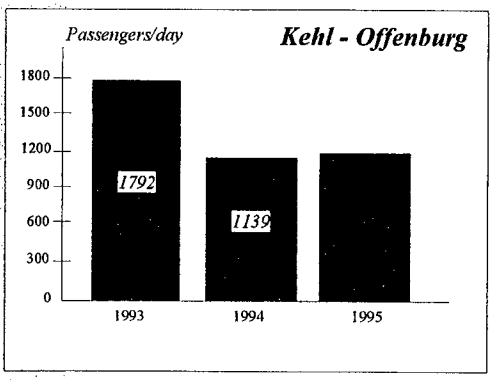
Progression of the Métro-Rhin customers





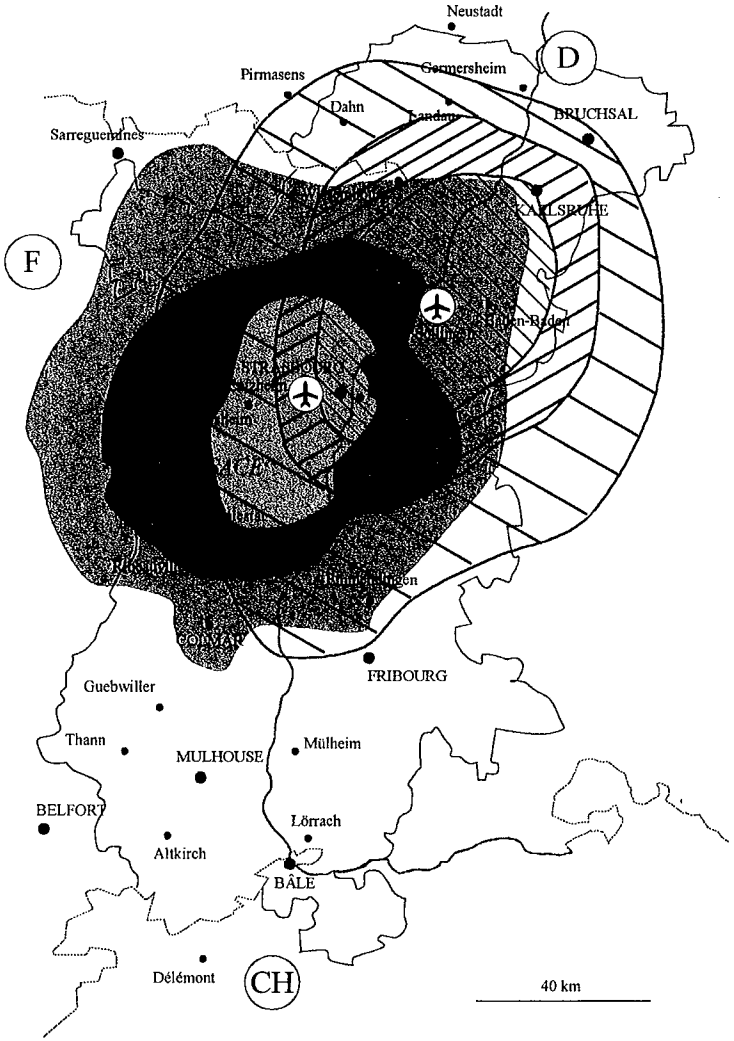


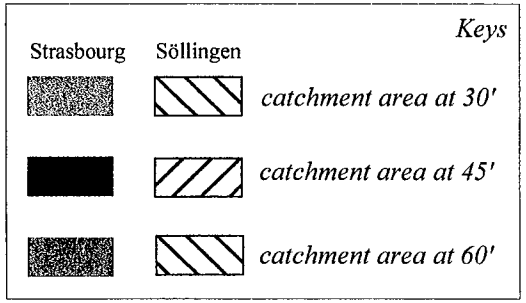
Métro-Rhin: cross-border train linking since May 1989 Strasbourg to Offenburg with 7 round trips/day

Financial report for the Strasbourg-Kehl section

Expenses :	*2902 KF*
Receipts :	*969 KF*
Balance :	*- 1933 KF*

Catchment area of customers of the airports of Söllingen and Strasbourg-Entzheim





IX

DRE Alsace- Division Economie des Transports

VISIT OF THE TRAFFIC MANAGEMENT CENTRE OF THE UUSIMAA REGION

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The Finnish National Road Administration (Finnra) is divided into nine regions. The Uusimaa region is probably the most significant of all the regions. It includes Helsinki, the capital of Finland. The population of Helsinki and its surrounding areas amount to about one million residents. While only having six percent of the country's public roads, the Uusimaa region represents twenty percent of the nation's traffic flow.

The traffic management centre of the Uusimaa region is being set up in connection with the existing road weather monitoring centre in autumn 1995. The tasks and the functions of the road weather monitoring centre have been expanded in such a manner that the centre can also function according to the aims and objectives of traffic management. The development of the traffic management centre is co-ordinated by a project called MATHEUS (**Ma**nagement of **T**raffic in **H**elsinki **U**rban **S**urroundings).

The MATHEUS-project aims to produce the traffic management centre to take care of traffic monitoring, traffic control and traffic information in the Helsinki area. The aims and the objectives of the traffic management centre are to improve traffic fluency and traffic safety and to reduce the pollution and other environmental damage caused by traffic. Co-operation between all the actors of the traffic management is highly needed. The traffic management centre of the Uusimaa region operates daily together with police, emergency services, cities and media to reach the goal, incident management.

The development of the traffic management centre will be proceeded in small steps. There are already several tools for traffic guidance and information in Uusimaa region:

- the queue warning (VMS) and the camera surveillance system on Helsinki Western Artery
- the route guidance system (VMS) on main road 4
- the long-distance control of the traffic lights and their surveillance system
- the variable message signs, weather and traffic monitoring on the E18 between Lohjanharju and Sammatti
- the moose detection and warning system
- the park and ride (P&R) system
- the traffic signs for bad road weather conditions and the road condition cameras
- the driving speed panels
- the variable speed limit signs at road construction sites

In the near future the main point of the development work will be on plans to make an integrated traffic management system with the new and already existing components.

URBAN TRANSPORT IN FRANCE: CASE STUDY

Maurice Abeille – CERTU France

1 About the propositions of change concerning traffic and environment in the Strasbourg area

1.1 Description of the initial situation (1991)

The expansion of the urban area of Strasbourg has caused problems in traffic of the city centre. Narrow streets suit badly to the automobile traffic. Car trip times have continually lengthened and parking problems have increased. In bus transport the travel speed is too low, timetables doesn't hold and there are raising pressures in ticket prices. The goods deliveries to city centre are getting more difficult due to congested streets. The quality of life in the city centre has got worse (pollution, noise, traffic accidents).

1.2 Objectives

Private car traffic will be restricted: through traffic will be limited in order to advance the loading and unloading of goods transports; resident parking system will be taken to use. The number of parking places will be reduced by ordering them in other purposes. The public transport system will be renovated: tramway becomes the basis of the system supported by the bus transport. Bicycle ways will be built. Safe routes for pedestrians will be arranged. The architectural values will be taken into account when making changes. The number of city residents is wanted to increase and the cultural life of centre is wished to stimulate.

1.3 Measures

The first thing to do is to contribute into public transport, so that access into city centre would be easier. The first tramway line has been built in 1994 and the bus network has been extended. Car traffic in the city centre will be restricted, electric car will be taken into test use in Central Business District (CBD). Streets of CBD will be turned into pedestrian streets, bicycle network will be developed in the city centre and it will be attached to the existing peripherical bicycle network (115 km). Parking facilities will be built to the outer border of the CBD and there will be a fast bus connection to the CBD. Bus travelling will be made easier for handicapped persons. Three tax stations will be set to serve the CBD. The routes, time limits, loading and unloading areas for goods deliveries will be planned. Comfortability of the area will be made better by plantings in market places etc.

2 HABITAT II
The traffic plan of the historical centre of Dijon

2.1 Important occurrences

1973: Pedestrian street project begins, the historical centre area gets preserved.
1976: The project for increasing the car accessibility in city centre gets abandoned, the construction of eastern passing-by road continues.
1978: The most important way in city centre gets reserved for buses and pedestrians, pedestrian streets in city centre are added.
1992-1993: Parking facilities (1200 parking places) are built outside the city centre, which gets reserved for pedestrians and public transport.

2.2 Before

Dijon is located in the crossing of great transport routes (Rhône Valley, connections from Paris to south-east France and Italy). Dijon is the administrational capital of Bourgogne and university town. There are 230 000 inhabitants in the Dijon area. During the 1980's the population of city centre decreased significantly.

2.3 After

- Population decreasement in city centre has stopped.
- University has 25 000 students, over 10 % of population.
- There are lot of working places in city centre.
- Area reserved for pedestrians is 68 000 m^2, car traffic in the city centre has been limited, use of public transport is common (170 trips/resident/year, only Paris, Lyon, Marseille and Nantes are in the same level).
- Historical and architectural things have been taken into consideration.
- Leisure time spending in the city centre has increased during 1980's.

2.4 Strategy

- Preservation and recondition of valuable buildings and spaces
- Improvement of residential environment
- Attraction of cultural life and tourism into city centre
- Development of residential blocks of city centre

The development of public transport doesn't affect on city centre alone. It concerns the development of the whole residential area. During 1980's the existing railroad network has been taken into use in the local train traffic and the railway fleet has been renewed. Local trains take care of connections mainly to the southern parts of the town.

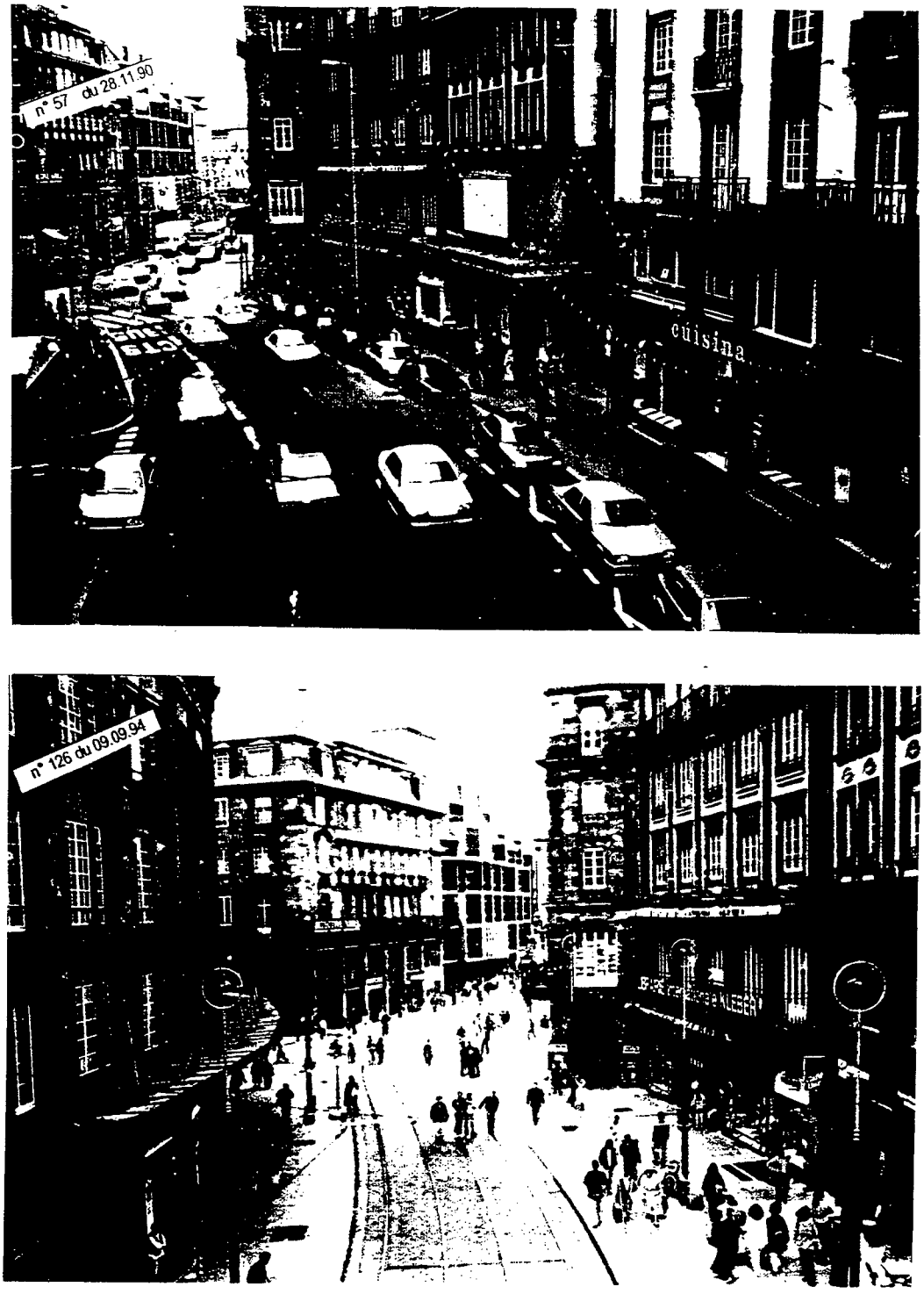
There has been set up a commission, which studies the traffic arrangements of the town and tries to see it as a part of the field of community planning. When the physical structure of an area is planned, the commission is requested for a statement about the requirements of public transport in the area.

In the course of this planning, in addition to the office work, there has also been arranged about 60 public meetings, where residents and entrepreneurs have been able to express their opinions.

Picture 1. Location of Strasbourg and Dijon.

Table 1. Comparison of urban public transport systems of Strasbourg and Dijon in 1995.

	Strasbourg	*Dijon*
Population of the area	*433101*	*230475*
Number of lines	*24*	*27*
Total length of lines (km)	*297*	*277*
Trips (million/year)	*54263*	*38096*
Vehicle kilometres (million/year)	*12048*	*8795*
Trips/resident/year	*125,2*	*165,2*
Vehicle kilometres/resident/year	*27,8*	*38,1*
Trips/vehicle kilometre	*4,5*	*4,3*



Picture 2. Example of a before-after comparison of traffic arrangements in Strasbourg.

Mr Juhani Tervala, Director of Infrastructure Unit
Ministry of Transport and Communications

15.11.1996 Suomalais-ranskalainen liikennesymposiumi

Alternative ways of highway financing

D.B.F.O in Järvenpää-Lahti motorway

The need to introduce private finance for roads has arisen on several different occasions. The Finnish Transport Infrastructure 2010 working group acting under the auspices of the Ministry of Transport has suggested that it would be unwise to lower the finance required to maintain the transport infrastructure below the 1995 level. The group noted that owing to the current strain on public finances, definite attempts should be made to experiment with new finance options, such as private finance, and to introduce these as suitable projects arise.

Compared to other western countries, expenditure on road management in Finland comes from one source only. Finland is the only western country where road management is funded only from the state's budget. For example, in England around one-third of the state's road budget will, in future, be spent on shadow toll projects. Another example is Norway, where a quarter of all road projects is carried out as toll roads. Earlier attempts were made to introduce direct road tolls also to Finland but political pressure led to these user-based private finance schemes being shelved. Also there is not enough traffic volumes to justify direct road tolls.

The use of private finance has long been under consideration also within the European Union. The EU approach has been to efficiently reconcile private and public finance. In 1994, the EU set up the Christophersen working group to develop new finance options. The group underscored the importance of private finance in funding projects. This year another high level working group was appointed to develop a public-private partnership in the project funding.

At present, Finland is developing its first privately financed infrastructure project. The Järvenpää- Lahti motorway will be realised by using the so called shadow toll or D.B.F.O system. DBFO is actually an abbreviation for Design, Build, Finance and Operate.

Based on competitive bidding, a private consortium will conclude a minimum 15 year DBFO agreement with the road authority under which it will design, build, finance and operate a specific stretch of road. The consortium will produce a service package for the stretch and it will receive payments from the state budget during the concession period. Payments will be based mainly on traffic volumes, and also partly on other criteria such as environmental factors and road safety. The proposed option would enable the project to get under way by spreading the costs over a long period. It is important to note that the state will pay for the entire road management system. The costs of designing, building and operating will not be separated. It will be the consortium's responsibility to price the actual traffic volume so that the state´s payments will cover all the expenses.

As I mentioned earlier the state's management contribution is based on traffic volume. Bidders will determine the unit price for traffic volume. The idea behind this pricing model is that the risks associated with traffic volume are spread between the client and the bidder.

At the invitation to tender stage, the road authority is not interested in how the bidder prices the construction or maintenance. The authority is interested in the cost of the road management as a whole. This approach aims to allow the bidder as much leeway as possible to use new innovative solutions. The road is expected to be opened for traffic in the autumn of the year 2000.

Estimating the final cost of a privately financed road project in advance is difficult, since the price is determined through competitive bidding and the contribution for management depends on traffic volumes. The bidding will determine how low the cost of private finance is when we finally know the principles of the shadow toll option and the impact of the competition. Nevertheless, the pricing model defines the maximum for state's payments

above which no payment will be made. This ceiling is necessary with respect to the budget economy because the flow of payments has to be reasonably well predicted. At the moment, we expect the consortium's turnover to be about 100 million Finnish marks per year.

It is also important to note that the state does not guarantee this project. Nor does the state intend to be a shareholder in the company.

Drawing comparisons between road management carried out using the shadow toll approach and the traditional method is difficult because the two alternatives differ significantly from each other. The shadow toll option is a completely new payment mechanism in road management, and the time span is exceptionally long by Finnish standards. Nevertheless, there are certain advantages and disadvantages, compared to conventional funding. I have listed the advantages and disadvantages of the shadow toll system. The advantages are:

- Design, construction and maintenance costs can be lowered by increasing competition.
- This approach reduces the need for state's paymentin the early years of the project and payment terms become easier.
- This approach highlights a macroeconomic means of examination, where investments and operations are examined as a whole.
- A private company is able to carry out a project much faster than is possible under existing budget practices. This brings socio-economic benefits. Implementation of the project would also help the unemployment.
- The consortium is better able to optimise the organisation and implementation than the State and has the ability to innovate.
- Optimum risk sharing would limit the state's exposure to cost overruns, etc.

On the other hand the disadvantages of the shadow toll option are:

- Setting up shadow toll projects involves a long-term commitment to carrying out certain projects, which in turn limits the finance available for other projects.

- The cost of the project is not clear until the invitation to tender stage, and the final cost is determined over the concession period, and it cannot be known exactly beforehand.
- Changes in circumstances and society can take place during a long concession period.

The Main Road 4 is the first shadow toll project in Finland. Today this road is a semi-motorway. The road alignment and other associated road systems have, however, been made so as to allow for future upgrading into a motorway. The length of the second carriageway to be built is about around 70 km.

The shadow toll approach is expected to reduce costs. Normally such a stretch of road would be divided into three sections, all of which would be tendered for separately. With the private finance approach, the consortium bids for the whole road management system. Thus the consortium can achieve economies of scale through which it can effectively cut construction costs. To date, there has been little competition for maintenance contracts. For example, if competition achieve a 10% cut in investment costs this will represent a saving of around FIM 50 million during the entire concession period. In operating costs, the saving would be about FIM 20 million.

The Järvenpää-Joutjärvi section suits the shadow toll option because, from the socio-economic aspect it is very feasible. The cost/benefit ratio of the project is 2,7 and the time and accident cost savings are estimated to be between 120 and 180 million Finnish marks annually. Additional savings are expected from shortening the construction time of the project. Compared to the current budget practice the project can get under way at least five years earlier than planned.

The state allocated 5 million Finnish marks in spring 1996 to cover the costs of planning the project. No documents existed for this type of project so FinnRA tailor-made its own documentation. As the DBFO-agreement is so new taxation laws were changed accordingly

In the beginning of May the tender notice was published in the Official Journal of the European Union. Five consortiums expressed their willingness to produce the service in

question. One of these was totally Finnish one Swedish and one French. The other two were Finnish-Swedish and Finnish-Spanish consortiums. All the consortiums met the criteria set beforehand and were given about three months to make their tenders. The selected tenders will be left next Tuesday after which the negotiations with the consortiums will start. The negotiation stage is needed as the consortiums are allowed to submit two alternative bids for the project.

Negotiations will lead to the final choice of partner and the concession will be signed in early 1997. The final decision at the governmental level will be made on the basis of information received from the bidding competition.

This is the first shadow toll project in Finland but there are over ten similar projects going on in the United Kingdom. As the time span of this project is exceptionally long it will take time to get a proper analysis. For now the Järvenpää-Lahti motorway will be the only shadow toll method project. If the analysis is positive the shadow toll approach will be adapted for other transport projects.

We are studying possible projects where private capital could be involved in providing railway infrastructure services.

This study concerns, on the one hand the financing of large track projects with private funds and on the other hand the best ways of introducing market forces into this area.

Main Road 4,DBFO

D Design

B Build

F Finance

O Operate

Main Road 4, DBFO
DBFO method

- International bidding for chosing the RoadCo
- Road Co designs, builds, finances and operates the road
- Contract period is long, minimum 15 years
- Government sets only the objectives. RoadCo decides how to achieve them
- Governments payments are mainly based on the traffic performance

Main Road 4, DBFO benefits

- Competition will reduce costs
- Scale benefits
- Costs will be payed over the concession period
- Investment and maintenance are examinend as a whole
- Socio-economic benefits of the project

Main Road 4, DBFO Timetable

- 5/96 Prequalification announcement
- 7/96 Selection of tenderers
- 11/96 Submitting of tenders
  Contract negotiations
- 1/97 Choosing the company

Main Road 4, DBFO

Companies taking part to the competitive bidding

- Group Vt4: SRV-Viitoset Oy, Niska & Nyyssönen Oy, Karjalan MUrske Oy, Ins.tsto Seppo Rantala Oy, Sata-Asfaltti Oy,Dragados SA (Spa)
- Nelostie Oy: Skanska AB (Swe), Skanska Oy and Tekra-Yhtiöt
- BOUYGUES SA (Fra)
- NCC AB (Swe), NCC-Puolimatka Oy
- VIANOVA: YIT-Yhtymä Oy, Neste Oy, Rakennus Oy Lemminkäinen

French Experience in Motorway Concessions•

by

Alain Fayard
Associate Professor, University of Lille I
Special Adviser to the Director, French Road Directorate

November 14, 1996 - Espoo, Finland

INTRODUCTION

This article presents the French experience of concession which spreads from concession of a motorway section granted to a public-owned company to concession of a network on a risk-financing basis. This experience is informative about the merits of toll financing, concession per se (i.e. the provision of public utilities by an autonomous body, either public or private, rather than by a government road authority or a government administration) and private risk-financing

I. BACKGROUND

1.1 Governments throughout the world are showing increasing interest in toll roads in general and private toll roads in particular ; interest is also growing in setting up autonomous public agencies or in giving to private companies roads to be built and/or operated in consideration of periodical payments, from public authorities.

1.2. France has experimented with both toll and non toll financing as well as with publicly and privately owned toll roads in building its system of motorways (or "autoroutes") and trends toward risk venture. The construction, maintenance and operation of the national road network is financed through the national budget (1/4 of total of resources), the regional budgets' grants to national network (1/4), and toll receipts (1/2). The total funding is more than 5 billions ECUS.

1.3 The French road network carries 66% of freight traffic and 90% of passengers' one. This network includes 900,000 km roads, 36,000 km of which compose the national network. On this 4% of the whole road network 40% of traffic is concentrated, in particular on motorways and more especially on toll motorways which support an average traffic of 23,000 vehicles per day. The intercity motorways which make the framework of the national network are usually tolled. Presently 7,400 km are in use (6,300 km of which are tolled) and 1,700 km 2 X 2 lanes expressways are quasi motorways ; accordingly the total of motorways and quasi motorways is over 9,000 km (more than 70% of which are tolled).

1.4 The French toll motorway system emerged in the 1950s and went through the four following distinct periods presented below.

• *A Concession can be defined as an arrangement whereby a public authority grants specific right to a company (semi-public, or private) to construct or rehabilitate infrastructure and operate the facility for an extended period. The company carries both investment costs and most of the commercial risks. The assets revert to the public sector at expiration of the contract.*

II. 1955-1969 : A COMMITMENT TO TOLLS WITH PUBLIC COMPANIES

2.1 In the 1950s the main rebuilding of World War II damages were over and car-ownership began to increase rapidly. By 1951 the Government established a special dedicated road fund (FSIR) which was to receive a percentage of motor fuel tax receipts but competing budgetary pressures prevented the Government from funding the FSIR in full. So, in 1955 a law was passed to allow toll financing of motorways ("autoroutes"). Public control would be maintained by granting concessions only to a local public organization, a Chamber of commerce or a "mixed" company in which public interests have a majority of shares".

2.2 Moreover the 1955 law stated "the use of "autoroutes" is, in principle, free" but the exception became rapidly the rule within a decade since, between 1956 to 1963, five "mixed" companies were set up (these companies are called "sociétés d'économie mixte concessionnaires d'autoroutes", or SEMCAs). Nevertheless, the initial concessions were for only short portions of motorways (50 to 70 kilometers) except, in 1963, for the top priority, the south-north axis part between Lille-Paris and Lyon (130 and 160 kilometers segments).

2.3 All five SEMCAs shared a similar financial and organizational structure : they were very weakly capitalized (100 000 to 300 000 Ecus) and share-holders were only public bodies; the national equity stake was held by the Caisse des Dépots et Consignations (CDC) a State-owned investment bank.

2.4 The Government provided an initial financial assistance by guaranteeing the loans of the SEMCAs and providing cash and advances which were fairly significant (averaging 30 to 40% of construction costs). Throughout the 1960s the SEMCAs were little more than paper organizations, nothing more than the "false nose of the State" as a Minister said. Their only staff was in charge of toll collection.

III. 1970-1981 : LIBERALIZATION AND PRIVATIZATION. EMERGENCE OF CROSS-SUBSIDIES

3.1 At the end of 1960s only 1,125 km of intercity motorways were in service A reform was set up in order to: (i) allow private companies to compete for new concessions; and (ii) strengthen the existing SEMCAs to give them more autonomy and responsibility.

3.2 Four competitions (and not bids for the principal's choice was absolutely free) resulted in awards to four private toll road companies between 1970 and 1973 for 300 to 500 km motorways each. All four new concessionaires were consortia of major French public works companies.

3.3 The Government was less generous with assistance for concessions granted in the 1970s than it had been in the 1960s. Nevertheless, significant financial aid stayed available to both private and SEMCAs concessions. For example for the first private company COFIROUTE 10 % of the funds was covered by equity, 10 % by in-kind advances from State, 65 % by State-guaranteed loans and 15 % by loans without guarantee, that is to say that 75 % of the funds was brought or backed by the Government.

3.4 Increasingly the motorways companies were expected to subsidize new branches with surpluses generated on their older segments which had higher traffic and had been built at lower cost. Moreover the dates at which the concessions on their older and more lucrative sections

expired would often be extended. A system of cross-subsidization within companies appeared gradually ; it undermined the concept itself of profitability of the individual motorway segments and even of the company (for SEMCAs).

3.5 Last but not least the concession agreement of the four private companies stated that the toll rates would be set by the company in the limits determined in the concession agreements ; this procedure was extended to SEMCAs. Nevertheless in 1975, the Ministry of Finance declared it would regulate tolls and eventually a French court, (the same court which gave an advice about concession agreements), ruled that the concession agreements violated a 1945 law. Tolls came back firmly under the Ministry of Finance's control and this Ministry can, by this way, control the entire toll motorway system.

IV. 1982-1994 : FACING THE CRISIS, A NATIONWIDE MECHANISM OF CONSOLIDATION NETWORK

4.1 At the beginning of the 80's the motorway system faced serious problems of cash deficit a reason of which (but not the only reason) was the oil crisis. The State took over three out of the four private companies and indemnified shareholders, which was a soft enforcement of the forfeiture clause.

4.2 Moreover, in 1982 the Government established in place of FSIR a new dedicated fund, the FSGT (Special fund for public works). This fund was allowed to issue bonds to give a leverage effect to the additional tax on top of fuel tax which was earmarked for it. On average, public resources dedicated to road (budget + FSGT) have been stable during the period of existence of this Fund, until 1987 : The FSGT increasing resources were compensated by decreasing budget funds.

4.3 With respect to the SEMCAs, a new Government Agency, Autoroutes de France (ADF) was set up in 1982 to serve as a clearing house for issuing new advances to and receiving repayment of former advances from the SEMCAs. ADF allowed the Government to go in cross-subsidies among companies (as well as within companies like since the mid 1970s).

4.4 In 1987 the Government announced its intention to strengthen ADF with an infusion of 2 billions French francs in capital (approx. 300 millions ECUS) which ADF could use to make advances to SEMCAs and to increase the State's equity amount. This capital infusion, taping funds of privatization strengthened the central Government's control over the SEMCAs.

4.5 By the late 1980s both local and national Governments began to discuss the possibility of new private concessions on a non-recourse basis, especially in urban areas.

V. SINCE 1994 CONTRACTUALIZATION AND CONSOLIDATION INSIDE THE PUBLIC SECTOR

5.1 Since 1994, pluri-annual contracts for investment have been implemented ; these contracts make a balance between investment and toll increase and give a clarity to concessionnaire for a five year range. The semi-public companies have been consolidated into three main groups in order to gain in terms of geographical coherence, and financial viability. Parallel to this consolidation, there has been an increase in the capital (from 4.3 million ECUs to 158 million ECUs). The prospects for the whole toll motorways system are not yet clear largely because of uncertainties about environmental requirements, the Ministry of Finance's policy toward tolls and the future of cross-subsidization with regard to Community's regulations.

VI. LESSONS LEARNED

6.1 France has set up, step by step, a road financing system adaptable to changing circumstances and which enables it to collect funds for a special target: the creation of a modern road network not financed by the tax payer but by the road user. Advisers too often think that only one solution exists. The French experience shows that solutions change ; the French concession is not a matter of statute law but of praetorian structure, of a common law, a trial and error process.

6.2 The French, Italian and Spanish intercity motorway systems are largely toll financed. France has a particularly broad experience : strictly speaking toll financing, semi public concession, private concession backed by Government, risk private concession, fitting project financing in concession.

VII. MERITS OF TOLL FINANCING

7.1 The key advantage of tolling for most countries is that it permits more motorway investments than it would be possible by relying on taxes alone. But it is not always possible to recover the costs of building and maintaining a motorway through tolls where traffic volumes are low or costs unusually high ; even in a developed country like France (whose car ownership was 200 cars per 1000 inhabitants in 1966, which is comparable to the actual level in Central Europe) a significant initial State's support was necessary to have a toll motorway system taken off ; then the extension of the network to routes where traffic is lower needed large cross- subsidies.

7.2 Tolling may also be used to improve the use of transportation network (allocation of road traffic, intermodal split) but pricing schemes have to meet different aims which can conflict with one another : incremental cost pricing, objective of recovering costs, maximization of yield.

VIII. DESCRIPTION AND MERITS OF THE CONCESSION

8.1 **Main Characteristics of a Concession**. The main elements of an infrastructure concession are:

- **Package size**. The role of the State is to define the « exact » size of package for which the companies will bid.

- **Duration** (construction and operation). The duration of an infrastructure concession (construction and operation) is long (usually over 30 years)

- **Tariff**. Tariff setting is a very sensitive issue. Depending on the country, the tariff can be set up by the Government (as the result of a negotiation between the concessionaire and the State) or by the implementation of a provision laid down in the concession agreement.

- **Award criteria** (price being not a basic criterium). The award criteria should be, where possible, clearly established. Moreover, when signing the contract, a re-negotiation between the State and the concessionaire should be scheduled so that environmental, political, and traffic-related constraints can be better assessed.

- **Freedom for innovating ideas**. The contract between the State and the concessionaire should be written in a way that would allow the concessionaire to come up with certain potential innovating ideas.

- **Service specification** The service specifications (but not necessarily the common « rules of the art » generally recommended) must be strictly followed by the concessionaire.

8.2 **Merits of a Concession**. The creation of an autonomous agency (semi-public or private) in charge of the construction, operation, and maintenance of a highway section presents the main following advantages: (i) earmarking resources for the maintenance of the highway network; (ii) introducing an actual discipline of management, and accounting; and (iii) reaching more flexibility in all the steps (the construction, maintenance, and operation) than the State would have. These three advantages are detailed below.

8.3 **Earmarking resources**. An obvious advantage is that the concession is the best way to earmark resources not only to build but also maintain the motorway. Moreover the concession gives an organizational framework to maintain and operate the motorway ; when an impetus was given to construction of non-tolled motorways, the public administration could find some useful trends in toll motorway companies organization chart to set up an organization fitted with high performance expressways.

8.4 **Discipline of Management**. The concessionaire may be able to design, build and operate the motorway in a more effective way owing to a longer time range than annual budget and a greater flexibility. Otherwise the company does not need to be private to be effective ; the point is the discipline of accounting, the image to be enhanced, the technical savoir-faire. (Nevertheless cross-subsidization within the company or even within the system erases this discipline and may alter the system into an administrative one).

8.5 **Flexibility**. During the stages of construction, and operation, the concessionaire has more flexibility than the State.

IX. MERITS OF PRIVATE RISK-FINANCING

9.1 Private financing of transport infrastructure is too often a contest between political dogma and economic rationality, a contest between economic and financial rationality, a contest between finance and civil engineering.

9.2 It is now time to determine criteria to decide whether a financing package is "public" or "private". First some misconceptions about private financing, among a lot, have to be listed : a project is not private because financial markets are tapped and is not public because a budget advance is granted (if this advance is a lump sum). Likewise the owner of the infrastructure can be a public body (in France, for instance, motorways are public property) but the right to levy tolls can be conceded to a company financing the project through a perfectly private scheme.

9.3 Finally, a true private financing must be stated as a private risk venture which means that a private investor of any kind accepts to bear directly part of the numerous risks of the project.

9.4 Consequently, risk ventures are always "mixed" schemes because the State (or public sponsor) has a capital part to play as a key partner in public works projects.

9.5 Private financing key word is "risk". When a private investor accepts to bear a risk, it asks for a return, a risk premium. Therefore private risk financing seems to cost more than public financing irrespective of cost of toll collection. It is because insurance has a cost (and those costs are generally hidden in public schemes), but it also benefits to the community as private investors can bring extra funds, management techniques, effectiveness, productivity gains and finance a

needed investment sooner and faster than the public sector could. As risks are numerous, they have to be shared between partners. A balance has to be found between them through a good concession contract negotiation to split the risks. Finally, a community of interest between principal and concessionaire and between concessionaire and its contractors through a well balanced contract can lead to a successful project for the satisfaction of each party.

9.6 The risk sharing structure is critical. All the risks are not the same and have not to be taken by the same entity. Four categories of risks can be presented:

Political and Legal Risks. These risks are typically taken by the State (with some guarantees if needed). They can be mainly of three natures: (i) acts of God, force majeure, war, civil disturbance; (ii) change of legislation; and (iii) government policy change, e.g., changes in regulatory regime, impossibility or unwillingness of the Government to meet its contractual obligations

Technical Risks. They are the construction or rehabilitation risks, which include risks on completion, quality, delays, cost overruns and project modification. These risks are typically assumed by the concessionaire.

Commercial Risks. The commercial risks arise because of the uncertainty of traffic levels (due to the possible improvement of an alternative infrastructure). The commercial risks (tariff x traffic) should in theory be taken by the concessionaire. However, experience shows that, particularly at the highway opening, these risks may be too high to be taken only by the concessionaire. Traffic has to be very carefully analyzed and traffic forecasts should be realistic.

Economical and Financial Risks. These risks are due to the uncertainty of economic growth, inflation rate, risk of rates, convertibility of currencies, and exchange rate. They are assumed by the concessionaire. However, there is a clear interrelationship between tariff setting, degree of competition (which can be set by the Government) and the concessionaire's income risks (not to mention a possible intervention of Government on tarrif, which is a political and legal risk).

9.7 **Limit of the Private Financing**. A problem is the possibility that the private company may, either be tempted to exploit any monopoly it might enjoy, or benefit by an unreasonable return on investment. The problem is to strike a balance between protecting the public from potential abuses of monopoly while insuring that the company has an opportunity to earn an adequate return on its investment. Therefore, the State may consider it useful to keep an operator in the system so that an acceptable price is always at least available.

9.8 In general terms, any government that seeks to encourage the private sector to participate, on a risk basis, in the development of public infrastructure must be prepared to foster a positive partnering attitude along with adopting and respecting clear-cut laws, rules and contracts. It is a challenge in every country for public officials, in particular those of the Ministry of Finance.

Conclusion of the symposium
Prof. Matti Pursula, HUT

Ladies and Gentlemen!

It is my pleasant duty to give a few closing remarks for the First French-Finnish Symposium on Urban Transport. These two days have been very interesting and inspiring, especially because we until now have been missing broad and continuous connections between French and Finnish transport specialists. Without doubt, the Finnish membership in EU will, together with increasing knowledge of the French language in Finland, increase contacts between our nations.

During these two days we have discussed several topics in the fields of urban, interurban and international transport. We have, among other things, learned the ways transport telematics is and will be used in both countries. It is my understanding that we share the same opinion that telematics in transport is not a purpose itself but a means to tackle the actual problems. The differences in approach are related to differences in problems in both countries. In general, the French have longer traditions in this field, and more congestion on roads than we in Finland do. On the other hand, we Finns have to develop our own approaches to deal effectively with adverse weather conditions and thin traffic flows by using our highly developed communication infrastructure.

Pedestrianization and promotion of public transport in urban areas are also very timely topics in both countries and the examples of French solutions have been extremely interesting. In Finland, tendering in public transport and DBFO in motorway construction are new approaches and here we have been able to present our solutions, and to compare them to the ways of financing and organising public transport and toll roads in France.

Cross-border traffic is a commonplace practise in Central Europe, and we have heard examples of the ways of organising that traffic between France, Germany and Switzerland. The Nordic countries, too, have long traditions in this field. Around twenty million people cross the Finnish borders between Sweden and Norway yearly, and we have financed common infrastructure, like bridges, on those borders.

But cross-border traffic is increasing between Finland and the East, too. We Finns have more that one thousand kilometres of common borderline with Russia, which gives us a gateway position between EU and Russia. In relation to that, our Russian and Estonian speakers have given us some perspective to the transport and infrastructure problems of our non-EU neighbours at the Gulf of Finland.

In all, this first French-Finnish Symposium on Urban Traffic has been very fruitful, both professionally and socially. I hope that it has opened new connections and contacts between French and Finnish professionals in this field. I hope that there will be some continuation for this kind of co-operation in the future. And last, I want to

thank the organisers and the sponsors of the symposium for their effort. Especially I want to thank His Excellency, The French Ambassador in Finland, Mr. Alain Briottet, and the Head of Road Transport Department of the Finnish Ministry of Transport and Communications, Mr. Harri Cavén, for their opening addresses. Warm thanks to all the speakers, especially our French, Russian, and Estonian guests for their interesting presentations, and to the audience for making this symposium an active forum of discussion and exchange of ideas.

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