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Prepared Ulrich Leiss

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Main Contributors

Ulrich Leiss (IABG) – author
Andrew Winder (ISIS) – peer review

Further information on EXTR@Web's editorial team for Thematic Research Summaries can be obtained from Annex III.

Distribution

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Abbreviations and Acronyms Used

AG	High level Advisory Group (to the EXTR@Web project)
BG	Benchmark Group (associated with the EXTR@Web project)
CEEC	Central and Eastern European Country
DG TREN	EC Directorate-General for Energy and Transport
EC	European Commission
EFTA	European Free Trade Association (Norway, Iceland, Switzerland, Liechtenstein)
ERA	European Research Area (EU, EFTA and CEECs)
EXTR@Web	Exploitation of Transport Research Results via the Web (DG TREN FP 5 Accompanying Measure project)
EU	European Union
FP 4 (5, etc)	EC Fourth (Fifth, etc) Framework Programme
PAG	Programme Analysis Group (part of EXTR@Web project)
PRT	Personal Rapid Transit
RTD	Research and Technical Development
TRKC	Transport Research Knowledge Centre; TRKC website at ec.europa.eu/transport/extra

Table of Contents

1. Introduction

This paper provides a structured guide to the results of Research and Technical Development (RTD) projects relating to **Other Modes**, carried out in transport research programmes throughout the European Research Area (ERA).
It is one of a series of 28 papers. Two further from an original set of 30 transport themes – i.e. Long-distance Transport and Financing Tools – have been discontinued as separate reports, though all related projects will eventually be covered elsewhere in Thematic Research Summaries.

	Paper no.	Transport theme
Dimension 1	1.1	Passenger Transport
	1.2	Freight Transport
	1.3	Urban Transport
	1.4	Rural Transport
	1.5	Regional Transport
	1.6	EU Accession Issues
Dimension 2	2.1	Air Transport
	2.2	Rail Transport
	2.3	Road Transport
	2.4	Waterborne Transport
	2.5	**Other Modes**
	2.6	Intermodal Transport
Dimension 3	3.1	Economic Aspects
	3.2	Efficiency
	3.3	Equity and Accessibility
	3.4	Environmental Aspects
	3.5	User Aspects (incl. ergonomics, quality, choice and rights)
	3.6	Safety and Security
Dimension 4	4.1	Decision-support Tools
	4.2	Information and Awareness
	4.3	Infrastructure Provision (incl. TENs)
	4.4	Integration
	4.5	Intelligent Transport Systems
	4.6	Regulation / Deregulation
	4.7	Land Use Planning
	4.8	Transport Management
	4.9	Pricing, Taxation and Financing Tools
	4.10	Vehicle Technology

Of the roughly **5600** projects from research programmes covered in the Transport Research Know-ledge Centre (TRKC), a total of **28** projects deal partly or fully with the issues of **Other Modes**.

1.1 How to use this paper

It is recommended that you use this paper to locate RTD (Research and Technical Development) results on sub-themes where you have a particular interest, rather than reading the paper from start to finish:

- Start in Section 2 to get an overview of the scope of the particular theme.
- Read Section 4 that summarises the findings for each sub-theme of interest to you.
- Consult Annex I to identify the individual projects, be they of European or national origin, relating to a particular sub-theme.
- If this is the first time you have used one of the series of thematic research summaries, it is strongly recommended that you read Annex II. This explains the background and purpose of the EXTR@Web project, and the basis upon which information in this document was selected and analysed.

The other sections of this paper can help you to gain an overall picture of the **Other Modes** theme, associated policy issues and the background of the EXTR@Web project.

The analysis in this paper is the responsibility of the EXTR@Web project team, and does not necessarily represent the official viewpoint of the European Commission.

1.2 The link to the Transport Research Knowledge Centre website

Further details on individual projects can be obtained from the Transport Research Knowledge Centre (TRKC) website at: **ec.europa.eu/transport/extra**

The TRKC website includes summaries and full final reports of individual projects, as well as a variety of analyses, and publications prepared by the EXTR@Web project.

How to best use the online resource:

- The 'Projects & Analysis' section allows the user to specify a project-wide search on 'Publication date', 'Origin', 'Document type', 'Mode', 'Sector', 'Geographic area', 'Policy objective' and 'Tool', or any combination of these criteria.
- This may be complemented, or superseded, by the flexible 'Free text search'.
- On the query result screen, free text search criteria may be refined, as appropriate. Further tick boxes here allow limiting query results according to 'Project status' (five levels).
- Query results are presented in a table, which allows for sorting by column (click on relevant column header for alphanumerical sorting).
- Project-specific summaries may include links to project websites, or provide contact details for the project, where available.

It should be noted that the online Transport Research Knowledge Centre will be updated frequently, though dependent on input from project co-ordinators.
Other parts of the TRKC website cover transport research at Programme level, and expand on transport related issues, e.g. in the 'Links', 'Events', 'Glossary' and 'FAQs' sections.

2. Scope of theme

2.1 Definition of theme

"Other land transport" consists of all transport not covered within the definitions of road 1 and rail. Other land transport requires special vehicles and infrastructure.

The category includes new modes developed with the intention to introduce innovation in technological and operational concepts. Innovations are mainly related to guidance and support, e.g. air cushions or magnet suspension instead of wheels, or guideways that vehicles straddle or where vehicles are suspended instead of those where vehicles stand. Innovative operational concepts include dual mode operation, with vehicles capable of using two types of facilities, fully automated operation and non-stop service from origin to destination of individual passengers.

The category of other modes comprises unconventional underground transport, e.g. utilising evacuated tubes, pipelines, fast moving walkways, various types of Personal Rapid Transit (PRT) and cable driven support systems.

2.2 Topics included in theme

This covers all management and operations of land transport and innovative means of transport which is neither classic road nor rail.

The topics included in this theme are:

- Infrastructure (planning, construction, maintenance) other transport systems, including stations, depots, etc;
- public or collective land-based passenger transport (either scheduled, semi-scheduled or demand-responsive), using unconventional means (i.e. other than ordinary public road or rail-based systems);
- walking and cycling support systems; and
- freight transport (by pipeline, aerial cableway, etc).

This paper covers technological solutions to assist walking, cycling, etc (such as moving walkways and cycle lifts) as well as innovative means to speed up walking and cycling like rollerblades, Go Peds etc. General research actions relating to slow modes, particularly insofar as they affect road design and management and their interaction with other road users are covered under the "Road Transport" thematic paper.

The above summary of topics describes the principal breakdown of technical, organisational and managerial aspects that come under the theme, whereas Chapter 4 of this document reflects sub-themes according to actual priorities in transport research policy.

[1] Note that the definition of Road Transport includes "classic" aspects of walking and cycling modes.

2.3 Significance of theme

The economy is growing and transport is in parallel growing even faster. This has consequences for the volume and the quality of transport, is threatening the environment and entailing risks for safety. In addition, the European Union is one of the most densely populated areas in the world and a lack of space is emerging. Congestion is producing intolerable costs and problems, e.g. external costs of around 4% of the GDP.

This situation calls for a reflection on possibilities to find new ways of transportation, using less surface space, enhancing safety, being more environmentally friendly, consuming less energy and being more efficient. Modern society requires hi-tech solutions characterised by a high degree of reliability. Industry and research are developing new ways of transportation which respond to most of the requirements mentioned.

3. Policy context

Congestion and sustainability
Road congestion is possibly the greatest single problem facing transport policy in Europe. Whilst urban roads, intercity highways and traffic nodes are collapsing almost every day, other conventional modes like rail are often not fully used to their limits. Consequently one of the EU policies aims at the revitalisation of railways, although this is not the subject of this thematic paper.

In the past canal, railway and road infrastructure has been built rapidly following each other to some saturation. Now the overarching policy for sustainability requires new technologies to improve the existing conventional modes of transport. These enabling technologies are dealt with in the thematic paper “Vehicle Technologies”. Furthermore new transport concepts are required not only through the introduction of new technologies but also the introduction of new operating concepts and services. Consequently other modes are tackled rather indirectly playing a complementary role to all conventional modes.

EU actions and policy priorities
The Commission Communication on “Developing the Citizens' Network” [2] stresses as a policy priority the support for public transport as a means to reduce congestion, energy use, pollution, noise and social exclusion, and to improve quality of life. In the area of guided urban transport the setting of standards is highlighted as a priority action also by the Action Programme 1998-2004 [4]. A key issue is the definition of a common core of technical specifications, to be used also for public procurement. This applies to conventional systems and may apply to innovative intermediate modes as well (intermediate modes are innovative bus and tram concepts filling the gap between conventional bus and rail-based transport).

City of Tomorrow and Cultural Heritage
This Key Action aims to improve urban sustainability throughout the EU by 2010 [5]. It will achieve this by concentrating the resources on four specific areas:

- City planning and management;
- cultural heritage;
- built environment; and
- urban transport.

The Key Action has been specifically designed to ensure rapid, EU-wide take-up of practical new approaches to urban governance, planning and management. It is expected to produce, within a decade, measurable advances in economic development, environmental performance and quality of life which will directly benefit the 80% of EU citizens who now live in cities and large towns. The Key Action 'City of Tomorrow and Cultural Heritage' makes urban issues the specific focus of an ambitious Community research programme for the first time.

Technologies and planning for more efficient urban transport systems constitutes the direct link to the “Other Modes” thematic paper. This last of the Key Action's four specific areas addresses the sustainability of city transport systems. Here, the aim is to reduce congestion and pollution dramatically, by developing tools and methods to support the formulation and implementation of new policies and new land use strategies, and by developing more environmentally-friendly alternatives to the private car. The integration of

land-use and transport planning, and comparative assessment of new urban transit technologies and systems, are among the specific topics addressed.
Europe can expect a great variety of benefits as a result of research carried out within the 'City' Key Action. In the short term – i.e. with the completion of FP5 – the main benefits are the deliverables developed and tested by the projects. These consist primarily of tools and methods designed to support a new, more holistic approach to urban sustainability. They will facilitate improved policy-making or, at operational level, the integrated application of new technologies and approaches – as a means of enhancing cities' social, cultural, environmental and economic sustainability.

The demonstration phases of many projects will also produce direct benefits - for example, reduction of emissions or noise, improved living conditions or easier access to essential urban services and historic sites. In some cases, these direct impacts will be on a very large scale.

Competitive and Sustainable Growth
The main targets of the Competitive and Sustainable Growth Programme are to:

- Produce, disseminate and use the knowledge and technologies needed to design and develop processes and produce high quality, environmentally and consumer friendly products which will be competitive on tomorrow's market;
- help increase economic growth, maintain and/or create new jobs in Europe;
- sustain the continuing innovation and modernisation efforts of manufacturing, processing and services enterprises (including SMEs) so as to improve their competitiveness; and
- support the development and implementation of Community policies that enable competitive and sustainable development.

This goes hand in hand with the development of related services, including transport, which are economic, safe and protective of the environment and quality of life as well as with the development of quality materials, reliable measurement and testing methods and the optimal use of specific research infrastructures.
The programme comprises a set of four Key Actions, helping to develop critical technologies, concepts and policies to solve clearly identified problems. The four key actions are: 'Innovative products, processes and organisation'; 'Sustainable mobility and intermodality'; 'Land transport and marine technologies'; and ' New perspectives in aeronautics'.

Eureka
The objective of Eureka is to support the competitiveness of European companies through international collaboration, in creating links and networks of innovation. This involves bringing high quality research and development efforts to the market and to use the multiplying effects of co-operation.

Eureka is tackling the challenge of a swiftly changing business environment and offers a platform for short-term as well as strategic collaboration. It offers flexible and dynamic support, quality label and expertise for market-oriented R&D projects. It offers a frame for co-operation to small and large companies and operates through its network of national members, while remaining open to global co-operation. The programme covers 9 themes, of which transport is one.

Commission Transport White Paper 2001 and mid term review 2006
Again other modes play an important complementary role within an overall sustainable transport approach. Transport scenarios are requested with a 20 to 40 years time horizon

and that is the estimated breakthrough timeline of many challenging means of transport within the “Other Modes” paper.

A major focus will be urban transport where 80% of Europeans are involved daily. How to increase mobility while at the same time reducing congestion, accidents and pollution is the common challenge to all major cities. Especially in this context, “other modes” solutions have a great potential in the near to mid-term future. Explicitly, smarter and cleaner vehicles are mentioned but “other modes” solutions go even beyond that, offering fully automated emission-free city vehicles.

Within the context of optimising infrastructure an action has been requested to encourage investment in new infrastructure and to ensure a balanced approach to land use planning. “Other mode” solutions are highly relevant in requiring new intelligent infrastructure and having the potential to reduce land use by introduction of fully automated vehicles and attractive 24-hour services.

4. Synthesis of findings from completed projects

Research projects contributing to the theme of **Other Modes** transport can be broken down to the following sub-themes:

- Road-based fully automated systems (cyber cars and trucks);
- Personal Rapid Transit (PRT), i.e. automatic vehicles offering individualised service travelling on their own guideway;
- non-conventional modes for urban collective transport including, among others, “intermediate modes”, i.e. innovative bus and tram concepts filling the gap between conventional bus and rail-based transport (e.g. the Nancy tram);
- high-speed guided systems (e.g. Maglev);
- dual-mode/multi-mode/multi-functional systems (alternating guided and unguided transport, modular vehicles, “rolling autobahn” for Alpine crossing of goods transport, etc.);
- walking and cycling support systems (fast moving walkways, bicycle lifts etc.) as well as means to speed up walking and cycling (rollerblades, Go Peds etc.); and
- pipeline type goods transport systems.

You may wish to further consult the following Thematic Research Summaries that present research findings which are complementary to those covered in this paper:

- D2.E-2.1 Air transport;
- D2.E-2.2 Rail transport;
- D2.E-2.3 Road transport;
- D2.E-2.4 Waterborne transport; and
- D2.E-2.6 Intermodal Transport.

Results from the following **11** projects have been included in this Thematic Research Summary:

Research sub-theme	Contributing projects
Road-based fully automated systems	CYBERCARS
Personal rapid transit	EDICT
Non-conventional modes for urban collective transport	NETMOBIL; SVI 1998/091, Non-conventional transport systems
High-speed guided systems	F1; F5a; F5b; F6
Dual-mode/multi-mode/multi-functional	Non-conventional transport systems
Walking and cycling support systems	Rollerblading: “La ville à l’heure du roller”
Pipeline type goods transport systems	Rohrleitungstransport

Detailed findings and policy implications for individual projects can be found in Annex I. Please refer to acronyms and project titles, respectively, listed above.

4.1 Road-based fully automated systems

4.1.1 Research objectives

In this area research objectives include evaluating new transport system concepts for enhanced and sustainable personal urban mobility, such as cybernetic technology.

4.1.2 Main findings

A new form of urban transport (in the near term, future plans go far beyond) is based on Cybercars, which are road vehicles with fully automated driving capabilities. Such an innovative transport system can provide attractive on-demand and door-to-door capabilities for passengers or goods and is one of the most promising solutions to compete with the conventional car.

Enabling technologies have been improved and tested at full scale vehicles, leading to appropriate certification procedures for testing. A test campaign including the public has shown feasibility and wide acceptance. However there is no appropriate harmonised legislation for such highly sophisticated fully automated systems.

If the political will is clear to offer this highly innovative alternative, this approach could lead quickly to a high portion of infrastructure dedicated to driverless cars (with mostly existing roads for low speed driving in limited access areas) and possibly new infrastructures for high speed driving in the mid-term horizon.

4.2 Personal Rapid Transit

4.2.1 Research objectives

In this area research objectives include evaluating and demonstrating Personal Rapid Transit (PRT) as an innovative mode of city transport.

4.2.2 Main findings

PRT contributes significantly to transport policy and all related policy objectives. This innovative transport concept allows affordable mobility for all groups in society and represents opportunities for achieving equity.

The demonstration of the PRT prototype system “ULTra” at a test site in Cardiff, four accompanying case studies at different cities and the overall European assessment indicated high overall benefits. The specific urban transport problems in particular of new member states, accession and candidate countries could be alleviated significantly at a lower cost than any other transport system.

PRT is the personalisation of public transport, the first public transport system which can really attract car users and which can cover its operating cost and even capital cost at a wider market penetration. PRT complements existing public transport networks. PRT is characterised through attractive transport services and high safety. A first fully operational system is urgently needed to demonstrate all capabilities and to alleviate some remaining critical issues. An active role of all key actors from city level up to the EU level is required to facilitate legislation, regulation and financial support.

4.3 Non-conventional modes for urban collective transport

4.3.1 Research objectives

In this area research objectives include:

- Alleviating increasing traffic congestion, pollution, lack of flexibility, integration and accessibility in the transport network;
- attracting car drivers to use public transport; and
- creating a sustainable “City of Tomorrow”.

4.3.2 Main findings

Oversight of research work identified a number of different approaches to the use of (semi)-automatic vehicles for providing sustainable urban transportation systems for the future. The wider scale implementation of these innovations substantially contributes to the reduction of the adverse impacts of transport on the environment, safety, social cohesion and economic efficiency.

The scale of innovation ranges from advanced Driver Assistance Systems (buses, trams and freight vehicles) to fully automatic, clean, driverless vehicles that can run on guide-ways, and on street mixed with pedestrians and possibly other traffic at low speed. Real systems are the Rivium park shuttle (driverless electric bus), operating like a horizontal lift and the PHILEAS bus (electric hybrid driveline) running automatically on dedicated bus lanes or being manually driven on city streets.

Electric driven vehicles are well suited for improving the quality of life in the urban environment producing extremely low noise only and no exhaust gases locally. However, they must also be integrated into a global mobility strategy to achieve not only environmental objectives, but also objectives related to transport and territorial planning. Supporting measures are needed to achieve further shift from private to public transport.

An active role of all key actors from city level up to the EU level is required to facilitate legislation, regulation and financial support for innovative transport modes especially involving driverless operation. Dissemination of the solutions and best practises are mandatory for rapid and manifold applications throughout Europe. Further research is needed to support complementary technology development and maturation as well as user acceptance.

4.4 High-speed guided systems

4.4.1 Research objectives

In this area research objectives include:
- Improving the scientific basis on which Switzerland's traffic problems might be solved, taking into account the growing interconnection with Europe, ecological limits, and economic and social needs; and
- providing a basis for decisions on whether new and innovative technologies like Maglev (Swissmetro) could provide a sensible technical alternative to conventional long distance transport modes.

4.4.2 Main findings

The demand for high-speed systems like Swissmetro will be particularly sensitive to variations in timetables and fares. The production of electricity is a major impact factor regarding the climatic and environmental overall efficiency. The specific proportion of grey energy and of indirect burdens on the environment per passenger-kilometre depends strongly on the passenger demand and its development over the system's intended life cycle. Economic and financial aspects of constructing and operating a Eurometro system also strongly influence the sustainability of a high-speed.

High-speed systems like Swissmetro could reinforce regional inequalities and benefit certain urban regions. Decisions should be taken according to the social/spatial context. According to the scenarios, the high-speed project is a social project in many ways.
In case of the Swissmetro investigations the large urban centres belong to the winners, the peripheral areas and eastern Switzerland have to be assigned to the losers. The presence of the Swissmetro would lead only to a very slight increase in the use of public transportation. The process of a potential implementation will not work without active participation of public decision-makers in the definition the transport project.

4.5 Dual-mode / multi-mode / multi-functional systems

4.5.1 Research objectives

In this area research objectives include reviewing and assessment of innovative public transport systems

4.5.2 Main findings

The systems studied are public transportation systems featuring automatic level of technology, not heavy infrastructure, modularity installation having a transport capacity in the range of 1,000-4,000 passengers per hour.

"Experimental Feasibility Studies" showed: the need of new 3D tools for the representation of the advanced public transport systems in order to analyse the physical and visual

impacts on the environment and on the users' perception and the need to carry out combined RP-SP (revealed preference/stated preference) surveys to analyse demand and to develop reliable forecasting models for modal split.

It was found that many of the advanced systems developed and actually operating (mainly in leisure parks, or on other private grounds) do not comply with the current legislation regulating safety in public transport.

It was also found that the financial viability of such innovative systems could not easily be achieved without substantial public co-funding into the investment cost. Although the operating costs are less than those related to the traditional public transport systems (e.g. bus) due to automated guidance and the absence of drivers, the investment costs offered by the market for the innovative technologies are still very high due to the absence of economies of scale.

4.6 Walking and cycling support systems

4.6.1 Research objectives

In this area research objectives include identifying the use of rollerblading as an urban means of transport, to determine reasons why users choose this mode, to identify areas of cities suited to this mode and difficulties encountered in sharing road or pavement space with other modes, to describe legal frameworks for managing the development of this mode and to evaluate the potential for its development in tomorrow's cities.

4.6.2 Main findings

Rollerblading is an increasing phenomenon in cities, both as a mode of transport and a sport/leisure activity. Common places for rollerblading (apart from parks and dedicated skate-parks) are on cycle tracks, riverside routes closed to motorised traffic, wide pavements, bus lanes and esplanades. However the development of rollerblading is restricted by the lack of a specific statute or recognition of this as a mode of transport, and by the perceived safety risk.

The use of rollerblading as a travel mode, rather than purely for sport or leisure, is low – about 10% of users. Advantages quoted by users are speed, utility, zero cost (apart from the equipment), polyvalence, intermodality (ability to use in combination with public transport) and suitability for short trips. Disadvantages according to users are the danger of road traffic, pedestrians in the way, physical obstacles, bans on rollerblading in certain places, limited capacity for carrying things and the need to carry protection.

Rollerblading co-exists well with cycling, as the speeds of the two modes are similar. Conflicts however come from speed differences on dedicated cycle tracks. Co-existence with pedestrians is more complex: pedestrians, especially older people, feel intimidated by the presence of rollerbladers on the pavement, with risks of collision. Conflicts also exist with cars, with motorists seeing the presence of rollerbladers on the road as abnormal, difficult to pass, and often engaging in dangerous behaviour. Rollerbladers on the other

hand often see car drivers as inconsiderate and lacking attention. Accident statistics show that rollerblading is no more dangerous than walking or cycling.

Of the five cities studied in a French project on this mode (Paris, Rennes, Annecy, Lausanne and Berlin), Paris was found to be the most favourable in terms of rollerblading as a mode of transport. Reasons were its space (wide pavements and esplanades), urban density, and the type of surfacing (mostly bitumen on the pavements rather than paving stones). In Berlin, rollerblading is very popular as a leisure activity, and although it benefits from an extensive cycle network and 30km/h zones throughout the city, the use of rollerblading as a mode of transport is reduced by smaller, more congested pavements which are difficult for rollerbladers, a lower urban density, less congestion and faster average car speeds on main roads, as well as less favourable weather than Paris. In Rennes and Annecy, rollerblading as a means of transport is little developed – the city centre pavements are surfaced with paving stones – but both cities have a pro-rollerblading policy, geared largely to leisure use.

Lack of methods to manage rollerblading stem from the assimilation of the rollerblader with pedestrians rather than as a mode in itself, and the assimilation of rollerblading simply as a sport. The recognition of rollerblading as a distinct mode of transport would, in addition to filling a legal void, reinforce the justification of policies favouring slow modes and would contribute to making cities more accessible.

In the future, the development of rollerblading as an urban travel mode depends on several factors: legal recognition of rollerblading as a mode, improvements in cities to favour slow modes, construction of cycle facilities, and improvement of rollerblade technology to improve transfer between rollerblading and walking.

Public authorities have every reason to facilitate rollerblading. This can be done by measures such as 30km/h zones, bus lanes and bus-only streets, cycle lanes and paths, widening of pavements and footpaths, etc; active policies such as building skate-parks, allowing mass rollerblade outings, organising events, etc; and measures to increase safety and awareness, e.g. training courses, inclusion in school sports activities, employing monitors/marshals for rollerblade outings, information, etc.

4.7 Pipeline type goods transport systems

4.7.1 Research objectives

In this area research objectives include:

- Investigation of the feasibility of a new underground goods transport system via pipelines; and
- assessment of economic benefits of pipeline transport versus high underground pipeline infrastructure investment costs.

4.7.2 Main findings

The result of a feasibility study carried out as a cluster project is the conception of a new, efficient and ecologically beneficial underground transportation system called

CARGOCAP. Goods are moved by individually and automatically controlled transportation units through underground pipelines laid into the public traffic area. As examinations have shown a comparably small nominal width of the pipelines of 1.6 meter is sufficient to absorb about 80% of the transported piece goods – packaging sizes corresponding to the dimensions of the Euro-pallets of 1050 mm. The underground route defuses above-ground conflicts about land utilization and guarantees the transportation process to be independent from current traffic obstructions. The use of environmental friendly steering techniques ensures better consideration of acceptability. The high infrastructure investment cost and the low operating cost of the pipeline system are together comparable in a long term period with the overall cost of truck transport but offer in addition superior environmental benefits.

Proofed constructions methods of trenchless technology with capable components of mechanical engineering can be combined with innovative technology to realize high degrees of automation. A competitive underground distribution network for economic areas is envisaged. The potential exists (task of a second feasibility study) to connect ports with inland distribution hubs widening the pipeline for diameters up to 8 meters covering full size oversea containers. This concept is seen as the 5th alternative of transportation.

The present status of the legal situation shows that the project can be realized briskly under predominant use of the public street network and will not be impaired by lengthy negotiations with property owners. Thus the improvement of the goods and trade traffic is not only covered at short notice but also promoted on a long-term basis. As with many innovations requiring high initial investment costs nobody will be the first implementer.

To be imbedded into existing material flow chains the planned transportation system requires flexible connections compatible with existing systems. This is to be achieved by the use of standardized transportation containers which are already proven in practice as the Euro-pallet.

Presently a test track in 1:2 scale is under construction in Bochum to demonstrate the system capabilities with three operating units. After successful demonstration a fundamental decision at EU policy level will be needed to embed such new infrastructure in a harmonized and standardized way into the overall transport policy.

4.8 Research gaps

There is rather little systematic research on “other modes”. A continuous survey and assessment of innovative new means of transport are missing.

Furthermore a better awareness and understanding of various new approaches is needed as well as harmonised comparison of the potential of different solutions for the future. A sound decision basis should be formed to start the appropriate initiatives at decision makers level whether urban, regional, national or European.

Recently started FP6 projects like CityMobil are the right way to integrate and implement different approaches in this area. Individual national activities should be transferred into a more common European basis.

5. References

[1] EXTR@Web project: 'Transport Research Knowledge Centre (TRKC) website' (ec.europa.eu/transport/extra), 2004-2006, Brussels

[2] European Commission: 'Keep Europe moving – Sustainable mobility for our continent. Mid-term review of the European Commission's 2001 Transport White Paper.'; COM(2006)314, CEC, 2006, Brussels

[3] CEC(1998a) Developing the Citizen's Network. COM(98)431, Brussels.

[4] CEC(1998b) The Common Transport Policy. Sustainable Mobility: Perspectives for the Future. COM(98)716, Brussels.

[5] CEC(2000a) Fifth Framework Programme: Energy Environment and Sustainable Development Work programme. Brussels.

[6] CEC(2000b) Fifth Framework Programme: Growth Work programme. Edition December 2000, Brussels.

Annex I: Contributing projects

Preface This Annex lists all the projects (European and national) which belong to the **Other Modes** theme, in alphabetical order of project acronym (for projects with acronyms), followed by projects without acronyms in alphabetical order of the project's name in English. Where results have been made available to the EXTR@Web project, a summary of key findings and policy implications relevant to this theme are given.

In 'Origin' column, use country designators as follows:

Austria – AT; Belgium – BE; Bulgaria – BG; Cyprus – CY; Czech Republic – CZ; Denmark – DK; Estonia – EE; European – EU; Finland – FI; France – FR; Germany – DE; Greece – GR; Hungary – HU; Iceland – IS; International – INT; Ireland – IE; Italy – IT; Latvia – LV; Lithuania – LT; Luxembourg – LU; Malta – MT; Netherlands – NL; Norway – NO; Poland – PL; Portugal – PT; Romania – RO; Slovakia – SK; Slovenia – SI; Spain – ES; Sweden – SE; Switzerland – CH; United Kingdom – UK; Other countries – Oth

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
A9	Pedestrian and cycle traffic	CH	Walking and cycling support systems
Project website www.nfp41.ch			
AMBIESENSE	Ambient, personalised, and context-sensitive information systems for mobile users	EU	Walking and cycling support systems
Project website www.ambiesense.com			
CODA-E	Rail road transportation system	EU	Dual-mode/multi-mode/multi-functional systems
Project website www.eureka.be/inaction/portfolio.do			
CYBERCARS	Cybernetic technologies for the car in the city	EU	Road-based fully automated systems
Key findings The project was focused on the development and dissemination of a new form of urban transport based on cybercars, which are road vehicles with fully automated driving capabilities. Such innovative transport system can provide on-demand and door-to-door capabilities for passengers or goods. The project has focussed on the improvement and testing of the technologies, on the certification procedures and on the dissemination. Policy implications If the political will is present to offer an alternative to traditional cars, this approach could lead quickly to a large infrastructure dedicated to driverless cars (with mostly existing roads for low speed driving in limited access areas) and new infrastructures for high speed driving.			

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
Project website www.cybercars.org			
CYBERMOVE	Cybernetic transport systems for the City of Tomorrow	EU	Road-based fully automated systems
Project website www.cybermove.org			
EDICT	Evaluation and demonstration of innovative city transport	EU	Personal rapid transit

Key findings

The overall assessment shows vast EU potential of the innovative PRT transport concept. The specific urban transport problems in particular of new member states, accession and candidate countries could be alleviated significantly at a lower cost than any other transport system.
PRT is the personalisation of public transport, the first public transport system which can really attract car users and which can cover its operating cost and even capital cost at a wider market penetration. A first fully operational system is urgently needed to demonstrate all capabilities and to alleviate some remaining critical issues. Furthermore, PRT complements existing public transport networks. PRT is characterised through attractive transport services and high safety; it:

- Offers on demand transport like a taxi but with lower fares;
- offers non-stop travel from every PRT station to your final destination (PRT station) within the network;
- implies usually no waiting time and even at peak hours just 1 -2 minutes;
- services are unique in the long off peak periods of conventional transport and at weekends and festivities;
- provides privacy and comfort like a car but you can also share your ride;
- enables easy access to older and disabled people;
- allows passengers to carry bulky shopping items;
- has a high transport capacity similar to light railway;
- offers good distribution and freight transport;
- integrates easily with the existing transport infrastructure, improving accessibility and the efficiency of different connections between modes;
- is potentially more efficient than any other mode comparable only with metro but offers greater comfort and privacy; and
- offers high safety standards, inherently the segregation from other modes and elevation avoids collision with other modes, cyclists and pedestrians.

Policy implications

PRT contributes significantly to transport policy and all related policy objectives. This innovative transport concept allows affordable mobility for all groups in society and represents opportunities for achieving equity.
Active roles of the EU, national governments and regional authorities are required immediately for developing areas such as legislation, regulation and financial support. City authorities are required to set up a process for early application of PRT as identified in the EDICT project. There is a unique opportunity for a European wide industrial effort to share the development and mass production of PRT vehicles and infrastructure which should form a modular system for any European city typology.
However there are still critical issues and barriers to be alleviated through decision makers at all levels:

- Awareness problem – there is a low awareness about the concept of PRT and its benefits. and still

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			

confusing classification of transport concepts;
- information exchange limitations – commercial interest of concept proposers or developers versus detailed information needs of implementers/evaluators;
- selection uncertainty – widespread proposals of new concepts with different depth of investigation and knowledge gained;
- technical issues to be addressed – ensuring safety and reliability during severe weather conditions and network capacity limits;
- acceptance limitation – visual intrusion if elevated;
- investment risks – possible investors are cautious about unproven figures;
- the procurement obstacle – if an innovative system like PRT follows the standard procedure unduly delays occur;
- decision dilemma – nobody will be the champion and be the first to take the risk; and
- research gaps – investigations and assessment needed on the missing link in low density areas and possible dual mode extensions.

Project contact

davina.fereday@ttr-ltd.com

F1	Demand projections for Swissmetro	CH	High-speed guided systems

Key findings

The results show that Swissmetro, if it were implemented in the year 2015 for example, would attract some 24,000 passengers between Geneva and Lausanne and approx. 34,000 passengers between Bern and Zurich.
- Conventional rail travel would decrease by about half on some relations; and
- the demand for Swissmetro will be particularly sensitive to variations in timetables and fares.

Policy implications

None.

Project website

www.nfp41.ch

F3	Technology assessment for high speed systems	CH	High-speed guided systems

Project website

www.nfp41.ch

F5a	Swissmetro and Switzerland: a trend analysis	CH	High-speed guided systems

Key findings

Given the sites of Swissmetro stops and the congruence of the project with urban development, Swissmetro should reinforce the tendency to concentrate activity in large Swiss cities. This concentration will affect all the centres of cities and also their surrounding areas. Swissmetro could reinforce regional inequalities and benefit certain urban regions. Swissmetro cannot act directly benefit peripheral areas.

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			

Policy implications

We advise that the decision whether or not to construct Swissmetro should be taken according to the social/spatial context. According to the scenarios, the high-speed project is much more up to the task of favouring desirable spatial developments than others. It will therefore be a matter of instrumentalising this transport project in order to arrive at the desired territorial effects. Such a process of implementation will not work without active participation of public decision-makers in the definition of this transport project which is also a social project in many ways.

Project website

www.nfp41.ch

F5b	Spatial effects of Swissmetro	CH	High-speed guided systems

Key findings

The Swissmetro had only a minimal impact on the allocation of activities. The large urban centres belong to the winners. The peripheral areas and eastern Switzerland have to be assigned to the losers. The presence of the Swissmetro leads only to a very slight increase in the use of public transportation.

Policy implications

We advise that the decision whether or not to construct Swissmetro should be taken according to the social/spatial context. According to the scenarios, the high-speed project is much more up to the task of favouring desirable spatial developments than others. It will therefore be a matter of instrumentalising this transport project in order to arrive at the desired territorial effects. Such a process of implementation will not work without active participation of public decision-makers in the definition of this transport project which is also a social project in many ways.

Project website

www.nfp41.ch

F6	Ecological effects of Eurometro	CH	High-speed guided systems

Key findings

As a Eurometro system would be operated mainly with electric power, the method or the technology used for generating electricity is a major impact factor regarding the climatic and environmental efficiency. • The specific proportion of grey energy and of indirect burdens on the environment per passenger kilometre, depends strongly on the passenger demand and its development over the system's intended life cycle. • Economic and financial aspects of constructing and operating a Eurometro system also influence the sustainability of a high-speed system very strongly.

Policy implications

- The issues of construction technology and the type of power generation and supply for the construction process should be investigated more extensive;
- other accompanying control measures, besides internalising external costs within the field of transport, have to be developed and evaluated; and
- economic and financial aspects have to be the focus of future research work as well, because of their influence on the sustainability of Eurometro.

Project website

www.nfp41.ch

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
FRAMSYN	An IT-based real-time information guidance-system for visually impaired	SE	Walking and cycling support systems
Project contact anna-lena@tfk.se			
MEX	Maglev Express; Parameter analysis and evaluation of maglev technology for rapid local and regional transport	DE	High-speed guided systems
Project website www.bahntechnik.de/index2.php?kat=2&content=8			
NETMOBIL	New transport system concepts for enhanced and sustainable personal urban mobility [CLUSTER PROJECT]	EU	Non-conventional modes for urban collective transport

Key findings

The project has had oversight of projects CyberCars and CyberMove on Cybernetic Transport Systems (CTS), EDICT on Personal Rapid Transit (PRT) and STARDUST on Advanced Driver Assistance and Vehicle Guidance Systems (ADAS). NETMOBIL has identified a number of different approaches to the use of automatic vehicles for providing sustainable personal urban transportation systems for the future. The application of the results substantially reduces the adverse impacts of transport on the environment, safety, social cohesion and economic efficiency.

- Advanced Driver Assistance Systems (ADAS) provide cleaner, safer and more efficient vehicles (cars, buses and freight vehicles), but ultimate control remains with a driver for the foreseeable future;
- Personal Rapid Transit (PRT) comprises fully automatic clean, driverless vehicles that run exclusively on guideways to segregate them from other traffic and pedestrians; and
- Cybernetic Transport Systems (CTS) are fully automatic, clean, driverless vehicles that can run on guideways, and on street mixed with pedestrians and possibly other traffic at low speed.

The major drivers for these new means of transport are:

- The "*transport problem*" case, where there are identified existing problems of increasing traffic congestion, pollution, lack of flexibility, integration and accessibility in the transport network;
- the "*sustainable city*" case, where the project is not problem driven, but driven by environmental and lifestyle goals and local development plans which derive from the vision of a sustainable "City of Tomorrow"; and
- the "*innovation policy*" case, where the project is not problem driven but driven by the goal of creating new opportunities through launching an innovation process.

Overall, the NETMOBIL solutions are expected to help:

- Shift demand from private to public transport;
- build and operate cheaper than conventional forms of guided public transport;
- free space for other uses and make more efficient use of road space dedicated to vehicles;
- make pricing and restraint policies more acceptable;
- provide a level of service which is superior to that available from conventional public transport because there is very little waiting time, travel is essentially private and is non-stop direct from origin station to destination;
- broaden the range of citizens for which public transport is easily accessible;
- improve liveability of urban environments;

Theme: **Other Modes**			Last update: **19 July 2006**
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Key findings / Policy implications / Project website or contact			

- improve environmental quality;
- reduce intimidation by cars;
- support other policies such as pedestrianisation of city centres and the re-qualification of public spaces;
- encourage public transport-oriented developments and integrate well with other forms of public transport;
- increase land use values; and
- increase area competitiveness.

Policy implications

In the short term, action is needed to exploit the potential and to create the framework for proper legislation regulation and standardisation. Key activities should be:

- Dissemination to increase awareness of the opportunities and potential these systems provide and to clarify the innovative concepts and solutions;
- support for champion cities who are willing to take the risks involved with implementing the new technologies and implement demonstrations;
- evidence of persuasive transport and business cases to support implementation and continuing operations;
- development of necessary EC and national facilitating regulations and standards;
- clarification of barriers and particularly of legal and institution issues and how to overcome them; and
- conduct of complementary research needed to support further technology development and maturation as well as user acceptance.

Project website

www.netmobil.org

PROMPT	New means to promote pedestrian traffic in cities	EU	Walking and cycling support systems

Project website

www.vtt.fi/virtual/prompt

PROTECTOR	Preventive Safety For Un-protected Road User	EU	Walking and cycling support systems

Project website

www.crfproject-eu.org

Rohrleitungs-transport	Container transport through subsurface pipelines – feasibility study [CLUSTER PROJECT]	DE	Pipeline type goods transport systems

Key findings

The result of a feasibility study carried out as a cluster project is the conception of a new, efficient and ecologically beneficial underground transportation system called CARGOCAP. Goods are moved by individually and automatically controlled transportation units through underground pipelines laid into the public traffic area. As examinations have shown a comparably small nominal width of the pipelines of 1.6 meter is sufficient to absorb about 80 % of the transported piece goods – packaging sizes corresponding to the dimensions of the Euro-pallets of 1050 mm. The underground route defuses above-ground conflicts about land utilization and guarantees the transportation process to be independent from current traffic obstructions. The use of environmental friendly steering techniques ensures better consideration of acceptability.

Theme: **Other Modes**			Last update: **19 July 2006**
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Key findings / Policy implications / Project website or contact			

Proofed constructions methods of trenchless technology with capable components of mechanical engineering can be combined with innovative technology to realize high degrees of automation. A competitive underground distribution network for economic areas is envisaged. The potential exists to connect ports with inland distribution hubs widening the pipeline for diameters up to 8 meters covering full size oversea containers.
The present status of the legal situation shows that the project can be realized briskly under predominant use of the public street network and will not be impaired by lengthy negotiations with property owners. Thus the improvement of the goods and trade traffic is not only covered at short notice but also promoted on a long-term basis.
To be imbedded into existing material flow chains the planned transportation system requires flexible connections compatible with existing systems. This is to be achieved by the use of standardized transportation containers which are already proven in practice as the Euro-pallet.

Policy implications

The high infrastructure investment cost and the low operating cost of the pipeline system are together comparable in a long term period with the overall cost of truck transport but offer in addition superior environmental benefits. After a sound demonstration of the system a fundamental decision at EU policy level will be needed to embed such new infrastructure in a harmonized and standardized way into the transport policy.

Project website

www.cargocap.de

SAVE-U	Sensors and system architecture for vulnerable road users protection	EU	Walking and cycling support systems

Project website

www.save-u.org

SVI 1998/091	Electric vehicles and new mobility concepts	CH	Non-conventional modes for urban collective transport

Key findings

The electric vehicle is an interesting "tool" for improving the quality of life in the urban environment: its lack of noise and atmospheric pollution constitutes an undeniable asset in the reduction of environmental problems in the city. But it must also be integrated in a global context of mobility to achieve not only environmental objectives, but also objectives related to transport and territorial planning. Mobility (self-sharing vehicles) and City Car (free service vehicles), allows a solution that is better adapted to the various mobility needs encountered in urban agglomerations.

Policy implications

The vehicles available for free service should benefit from special measures aimed at ensuring their competitive use in relation to automobiles, such as:

- Complementarity with the various public transport and road networks;
- possibility of use for urban and suburban travel;
- preferential access in certain areas; and
- favourable parking conditions in the urban environment.

Project website

www.aramis-research.ch/d/1891.html

Theme: **Other Modes**			Last update: **19 July 2006**
Acronym	Project title (in English)	Origin	Research sub-theme
Key findings / Policy implications / Project website or contact			
SVI 2001/504	Package of measure for the promotion of pedestrian and bicycle traffic in Switzerland	CH	Walking and cycling support systems
Project website www.aramis-research.ch/d/2426.html			
–	Automatic public transport system with segregated right of way	IT	Non-conventional modes for urban collective transport
Project website (or contact) None			
–	High-speed travelator (moving walkway). Test in the Invalides underground station (Paris)	FR	Walking and cycling support systems
Project website (or contact) None			
–	Magnetic rising transport system	IT	
Project contact Prof. Franco Di Majo, Centro Studi sui Sistemi di Trasporto (C.S.S.T. S.p.A.)			
–	Non-conventional transport systems: application fields and feasibility analysis	IT	Non-conventional modes for urban collective transport

Key findings

The systems studied are public transportation systems featuring automatic level of technology, not heavy infrastructure, modularity installation, transport capacity in the range of 1,000-4,000 passengers per hour. Application opportunities include university campus, hospital and health districts, congress centres, commercial centres, central business districts, tourist locations.
The project has reviewed existing experimentations and applications all over the world. A classification has been developed which considers not only the technology-related issues but also the contexts in which the systems can be used based on the current legislation, the transport and other economic desired impacts and the financial viability.
"Experimental Feasibility Studies" for implementation of non conventional PT systems have been carried out in four test-sites, identified in the university campuses of the research units involved in the project. These studies have showed:

- The need of new tools (e.g. 3-dimensional ones) for the representation of the advanced PT systems in order to analyze the physical and visual impacts on the environment and on the users' perception; and
- the need of carrying out combined RP-SP surveys for the analysis of the demand and to develop reliable forecasting models for modal split.

Policy implications

The legislation and financial aspects of the implementation of advanced PT systems in urban areas have been addressed.
It was found that many of the advanced systems developed and actually operating (mainly in leisure parks, or on other private grounds) do not comply with the current legislation regulating safety in public

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transport.
It was also found that the financial viability of such innovative systems cannot be easily achieved without a substantial public co-funding into the investment cost. Although the operating costs are less than those related to the traditional PT systems (e.g. bus) due to automated guide and the absence of drivers, the investment costs offered by the market for the innovative technologies are still very high due to the absence of scale economies.

Project website

cofin.cineca.it

–	Prototype system for dynamic behaviour of cable plants	IT	

Project contact

Prof. Enrico Pagano, Università degli Studi di Napoli "Federico II"-Dpt Ingegneria Elettrica (CRIAT)

–	Public Transport Bike	NL	Non-conventional modes for urban collective transport

Project website

www.ov-fiets.nl

–	Rollerblading: “La ville à l’heure du roller” – Evaluation of the use and management of a new non-motorised urban mode of travel in France and abroad	FR	Walking and cycling support systems

Key findings

Rollerblading is an increasing phenomenon in cities, both as a mode of transport and a sport/leisure activity. Common places for rollerblading (apart from parks and dedicated skate-parks) are on cycle tracks, riverside routes closed to motorised traffic, wide pavements, bus lanes and esplanades. However the development of rollerblading is restricted by the lack of a specific statute or recognition of this as a mode of transport, and by the perceived safety risk.
The use of rollerblading as a travel mode, rather than purely for sport or leisure, is low – about 10% of users. Advantages quoted by users are speed, utility, zero cost (apart from the equipment), polyvalence, intermodality (ability to use in combination with public transport) and suitability for short trips.
Disadvantages according to users are the danger of road traffic, pedestrians in the way, physical obstacles, bans on rollerblading in certain places, limited capacity for carrying things and the need to carry protection.
Rollerblading co-exists well with cycling, as the speeds of the two modes are similar. Conflicts however come from speed differences on dedicated cycle tracks. Co-existence with pedestrians is more complex: pedestrians, especially older people, feel intimidated by the presence of rollerbladers on the pavement, with risks of collision where the pedestrian does not observe or predict the trajectory of a rollerblader. Conflicts also exist with cars, with motorists seeing the presence of rollerbladers on the road as abnormal, difficult to pass, and often engaging in dangerous behaviour (weaving between cars, or holding onto moving vehicles). Rollerbladers on the other hand often see car drivers as inconsiderate and lacking attention. Accident statistics show that rollerblading is no more dangerous than walking or cycling – all that is required is for rollerbladers to have a certain level of skill and for others to be aware of their presence.
Of the five cities studied (Paris, Rennes, Annecy, Lausanne and Berlin), Paris was found to be the most

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favourable in terms of rollerblading as a mode of transport. Reasons were its space (wide pavements and esplanades), urban density, and the type of surfacing (mostly bitumen on the pavements rather than paving stones). In Berlin, rollerblading is very popular as a leisure activity, and although it benefits from an extensive cycle network and 30km/h zones throughout the city, the use of rollerblading as a mode of transport is reduced by smaller, more congested pavements which are difficult for rollerbladers, a lower urban density, less congestion and faster average car speeds on main roads, as well as less favourable weather than Paris. In Rennes and Annecy, rollerblading as a means of transport is little developed – the city centre pavements are surfaced with paving stones – but both cities have a pro-rollerblading policy, geared largely to leisure use.

Policy implications

Lack of methods to manage rollerblading stem from the assimilation of the rollerblader with pedestrians rather than as a mode in itself, and the assimilation of rollerblading simply as a sport. The recognition of rollerblading as a distinct mode of transport would, in addition to filling a legal void, reinforce the justification of policies favouring slow modes and would contribute to making cities more accessible.
In the future, the development of rollerblading as an urban travel mode depends on several factors: legal recognition of rollerblading as a mode, improvements in cities to favour slow modes, construction of cycle facilities, and improvement of rollerblade technology to improve transfer between rollerblading and walking.
Rollerblading should be allowed both on the roadway and on the pavement, as well as on cycle paths and in bus lanes, on the condition that rollerbladers adapt their speed appropriately and do not consider that they have priority over any other user.
Public authorities have every reason to facilitate rollerblading. This can be done by measures such as 30km/h zones, bus lanes and bus-only streets, cycle lanes and paths, widening of pavements and footpaths, etc; active policies such as building skate-parks, allowing mass rollerblade outings, organising events, etc; and measures to increase safety and awareness, e.g. training courses, inclusion in school sports activities, employing monitors/marshals for rollerblade outings, information, etc.

Project contact

philippe.vallouis@ademe.fr / ollivierh@aol.com

–	S0033/VD Construction standards of 'Go-Peds' and similar vehicles	UK	Walking and cycling support systems

Project website

www.dft.gov.uk/stellent/groups/dft_roads/documents/pdf/dft_roads_pdf_023512.pdf

Annex II: General information on the Transport Research Knowledge Centre and analysis process used

The Knowledge Centre's background

The EXTR@Web project – Exploitation of Transport Research Results via the Web – attempts to collect, structure, analyse and disseminate transport research results, covering not only EU supported but also nationally financed research in the European Research Area (ERA), as well as selected global transport RTD programmes and projects.

The EXTR@Web consortium has brought together eight main contractors to combine strong and in-depth technical knowledge of transport technology and of EU and national transport RTD programmes with solid communication and dissemination experience.

The current project's direct predecessor, EXTRA (a Fourth Framework Programme Transport RTD project), co-ordinated dissemination activities on the European level for the first time. While FP4 addressed transport research on a mode-by-mode basis, the current Fifth Framework Programme (FP5) focuses on generic themes that consequently reflect transport policy objectives.

The EXTR@Web project will provide support to research at European and national levels by building up and promoting an electronic hub. The key objectives are:

- To establish a comprehensive web-based Knowledge Centre, providing structured and timely access to both detailed and user-oriented summary information on transport research programmes and their results across Europe;
- to provide an electronic hub for inter-connecting European and national programmes and individual networks concerned with transport research into an easily navigable European network;
- to establish a common best practice scheme for the structure and content of the reporting of transport research results;
- to provide high-quality analytical outputs that are structured and tailored according to the type of stakeholder and medium; and
- to raise awareness of the new service, the implications of emerging results, and the wider opportunities under national research programmes across Europe as a whole.

EXTR@Web will provide a comprehensive pool of programme, project and results related information to users, principally in electronic format via the Internet. The approach is based on three main strokes of work covering:

- Monitoring, analysis and information preparation;
- website and electronic news service, the principal dissemination channels; and
- management of knowledge transfer, including dissemination by non-electronic means, and also the maintenance of a contact database and e-mail enquiry service and evaluation of the performance of EXTR@Web.

Definition of transport research

For inclusion into the Transport Research Knowledge Centre, Transport research programmes and projects have to be within the definition of research and transport simultaneously. This will define the eligibility of projects.

Definition of research

General OECD definition:
"Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications."

Additional transport research criteria:

- Targeted – in line with transport policy aims, strategies and processes to solve the inherent problems for society.
- Accessible – a public activity, open to scrutiny by peers.
- Transferable – useful beyond the specific research project, applicable in principle to other researchers and research contexts as well as decision-makers in policy, industry and science.

Definition of transport

In order to clarify expectations from the Transport Research Knowledge Centre, and to ensure a common understanding of important terms, the Programme Analysis Group of EXTR@Web has come up with the following definition of transport.

- Transport is the means by which a person or material of any kind is passed from its origin to its destination.
- Transport comprises:
  - the transport users: passenger, business, freight;
  - the transport vehicles (full life cycle issues);
  - the transport infrastructure (full life cycle issues);
  - the transport system: the interaction of users, vehicles and infrastructure;
  - the impacts of transport: contribution to objectives, and hence to overall sustainability; and
  - the transport tools: methods and instruments to help ensure an effective contribution to the objectives.

Three levels of analysis

Project level analysis

For European, national and international projects the following harmonized process was agreed:

- For each eligible project, the project co-ordinator will be requested to draft a Project Profile;
- the EXTR@Web consortium identifies, for each project all relevant themes (typically up to five), and provides the project linkage;
- for each eligible project, the project co-ordinator will be requested to draft the other elements of the reporting scheme – Progress Summary and Result Summary – due to the project progress and provides the final report;
- projects with highest relevance and best available final results will be selected for analysis;
- for every such relevant theme within each project a short and concise paragraph – structured with bullet points as appropriate – will be written to present the key findings of the project in relation to the objectives of the theme; and
- this information will be searchable on the Knowledge Centre website.

Thematic analysis

The thematic analysis has been exploiting existing project level analysis. The consolidated project wise findings have been structured and analysed along 30 themes, which are fixed for the project life time and fed into annual Thematic Research Summaries and Annual Compendia. However, for reporting purposes Thematic Research Summaries have been limited to 28 volumes (cf. Chapter 1).
The sequence of outputs has been comprising an explanation of the overall structure, and regular reports treating national, European and international research in a comprehensive way.

Deliverable number	Title	Release date (final version)
D2.A	"Thematic structure and definitions – all themes"	August 2006
D2.B	"European, national and international project database"	July 2006
D2.C	"First annual thematic research summary"; 30 vol.	December 2004
D2.D	"Second annual thematic research summary"; 10 vol.	March 2006
D2.E	**"Third annual thematic research summary"; 28 vol.**	**August 2006**

Table: The sequence of deliverables

Policy level analysis

Whilst the 30 themes are fixed, this type of analysis should give the flexibility to provide information on ad hoc policy priorities. Hence, policy level analysis will synthesize key findings of projects across combinations of themes. As an output, policy brochures shall be prepared depending on ad hoc requirements by DG TREN or by the high-level Advisory Group (AG).

Annex III: Editorial team for Thematic Research Summaries

Please note that – in principle – all EXTR@Web partners and sub-contractors will be contributing to a particular Thematic Research Summary because all project level findings that are of some relevance to one of the 28 (30) individual themes are presented in the comprehensive format of these papers.
The following summary of authors and peer reviewers is presented in alphabetical order while the main author of this paper is given on page i of the document.

Fabien Dreveton, ISIS; France
Mr Dreveton has an electrical engineering post-MSc degree, an MBA and over 8 years experience in Intelligent Transport Systems for road transport. He has been a senior engineer with ISIS since 2001, specialising in traffic control, motorway management, ITS standards development process and system architecture.
Co-author: Road Transport

Prof J Augusto Felício, Neptune – CEGE/ISEG; Portugal
Professor Felício, holding a PhD in management, is teaching graduate and post-graduate courses such as 'Maritime transport and port management' and 'Land transport and logistic management' at ISEG, School of Economics and Management (Technical University of Lisbon). His activities include participation in transport research where he has published several related articles and books.
Main author: Waterborne Transport, Intelligent Transport Systems
Peer review: Efficiency, Vehicle Technology

Dr Paul E Firmin, Institute for Transport Studies, University of Leeds (ITS); UK
Dr Firmin has 30 years of experience in transport planning and engineering, including local authority, consultancy and academia. His research specialities are: traffic management, transport survey design & analysis, traveller information systems; driver route choice behaviour and transport telematics. He is currently the MSc(Eng) degree programme leader and international student adviser at ITS, University of Leeds. He teaches computing skills and traffic management, and supervises student dissertation projects.
Main author: Information and Awareness
Peer review: Safety and Security

Dr Nils Gendner, Neptune – University of Bremen, ISL; Germany
Dr Gendner has been working for more than four years at the University of Bremen, Institute of Shipping Economics and Logistics. His main topics include the analysis of processes, functions and data flows in shipping and within the rail sector. He contributes to ongoing efforts in intermodality by participating in several projects dealing with intermodal concepts and developments.
Main author: Intermodal Transport, Integration
Peer review: Financing Tools, Pricing and Taxation

Wolfgang Helmreich, Industrieanlagen-Betriebsgesellschaft mbH (IABG); Germany
Mr Helmreich is a civil engineer from the Technical University of Munich. He has more than 15 years experience with transport planning and infrastructure design in the rail, road and air sector, and sound knowledge of vehicle technologies. His expertise also includes project management, web publishing and dissemination skills. He joined IABG in 1999 as a senior transport consultant after working as project manager at several German engineering companies. He is principal editor of all Thematic Research Summaries.

Main author: Air Transport, User Aspects, Safety and Security
Peer review: Regional Transport, Rail Transport, Waterborne Transport, Environmental Aspects, Land Use Planning

Cristina I Ivan, Group of Independent Experts Ltd (GIE); Romania
Ms Ivan has a law degree and has graduated a Master course in project management. Ever since 1998 she has participated in various projects financed by international donors in Romania. The main areas of her expertise cover: project management, legal approximation of the EU acquis & drafting of environmental legislation, as well as the carrying out of awareness raising and dissemination activities, including those for the transport sector.

Main author: EU Accession Issues
Peer review: Economic Aspects, User Aspects, Transport Management

Dr Ann Jopson, Institute for Transport Studies, University of Leeds (ITS); UK
Dr Jopson is a Research Fellow whose main interests and expertise lie in the areas of travel behaviour psychology, transport marketing and urban transport planning and policy, with particular emphasis on travel demand management through attitudinal and behavioural measures. Her PhD thesis was based on the role of psychology in reducing car use.

Main author: Environmental Aspects
Peer review: Rural Transport

Dimitris Koryzis, Systema; Greece
Mr Koryzis is a production & management engineer from the Technical University of Crete and holds an MSc in Decision Sciences from Athens University of Economics & Business. He has more than 8 years experience as technical and managerial consultant for 30 European programmes in the transport sector (road, maritime and intermodal) as well as in research and innovation technology EC projects.

Co-author: Pricing, Taxation and Financing Tools
Peer review: Integration

Ulrich Leiss, Industrieanlagen-Betriebsgesellschaft mbH (IABG); Germany
Mr Leiss is an aerospace engineer from the Technical University of Munich. His professional career includes 24 years experience with research, technical analyses, monitoring and managing national and European projects and programmes. These activities cover the areas aerospace, transport, energy and new technologies.

Main author: Other Modes, Vehicle Technology

Bryan Matthews, Institute for Transport Studies, University of Leeds (ITS); UK
Mr Matthews has 9 years experience of transport research and project management in both consultancy and university settings. His research expertise is in transport policy analysis and transport economics. He has worked on a number of EU, UK DfT and Research Council projects. He also contributes to teaching activities, lecturing on Air Transport Systems and supervising student projects.

Main author: Rail Transport
Peer review: Air Transport

Prof Anthony D May, Institute for Transport Studies, University of Leeds (ITS); UK
Professor May has over 35 years' experience in transport planning and traffic engineering. He has been a professor at Leeds since 1977, and has served as Head of the Department of Civil Engineering, Dean of the Faculty of Engineering, Pro-Vice Chancellor for Research and Director of the Institute for Transport Studies. He also has practical experience with the MVA consultancy and the GLC in London. His research specialities include: land use planning, traffic management, road pricing, sustainable urban transport, integrated transport and environmental impacts of transport.

Supervision of entire process of thematic reviews

Batool Menaz, Institute for Transport Studies, University of Leeds (ITS); UK
Ms Menaz is a transport economist from the University of Leeds. She has been involved in a number of various projects including research into transport pricing reform issues in air, road and rail for the IMPRINT-Europe thematic network project, and research for the UK Rail Research Centre looking at the alternative visions for the future of the British rail system.

Main author: *Regulation/Deregulation*
Co-author: *Passenger Transport, Equity and Accessibility, Land Use Planning*
Peer review: *Road Transport*

Christina Paschalidou, Systema; Greece
Ms Paschalidou is a transportation engineer from Aristotle University (Thessaloniki), with a MSc in Urban and Regional Transport from Laboratory of Transport Economics in Lyon. Her field of interest is transport planning and engineering, EU and national transport policies, sustainability issues and research. She joined Systema in 2005, while her previous experience includes an internship in ISIS, traffic studies elaborated individually and research activities in the Aristotle University.

Main author: *Transport Management*
Peer review: *Information and Awareness*

Ignacio Rada Cotera, Neptune – IkerConsulting; Spain
Mr Rada Cotera is a lawyer from Deusto University in Bilbao, holding a diploma and certificate of European studies from Deusto and Saarland Universities, respectively. He has been working on EU projects since 2000. His main expertise is European commercial and regional policy, maritime transport and port affairs, legal aspects of international economic relations, urban planning, regional benchmarking and development.

Main author: *Regional Transport*

Marco Valerio Salucci, Università di Roma "La Sapienza", DITS; Italy
Mr Salucci holds a degree in mechanical engineering from the University of Rome “La Sapienza”. His past research experience has focused on computer modelling of the operations of freight terminals and automatic passenger transport systems, the latter being carried out within EC funded research projects. His current research for a doctorate is in the area of transhipment and information and communication technologies for intermodal freight transport.

Co-author: *Freight Transport, Urban Transport, Rural Transport, Efficiency, Decision-support Tools*
Peer review: *Intermodal Transport*

Dr Karsten Seidel, Neptune – European Networks and Cooperation; Belgium/Germany
Dr Seidel has graduated as economist and holds a PhD from the University of Bremen. He has been working on EU projects since 1988. His main expertise is in European industrial and regional policy, telecommunication research projects, maritime transport and port affairs, evaluation of technical aid, urban planning, regional benchmarking development.

Co-author: *Regional Transport*

Dr Paolo Delle Site, Università di Roma "La Sapienza", DITS; Italy
Dr Delle Site holds an PhD, and is a senior research fellow at DITS, Transport Area, University of Rome “La Sapienza”. He combines professional experience with research activities, the latter mainly being carried out within EC funded research projects. Related activities comprise urban transport planning, urban public transport design, transport project assessment, and policy analysis. His teaching activities include courses in transport planning. Furthermore, he is author of papers in Transportation Research Part A – Policy and Practice and in the European Journal of Transport and Infrastructure Research.

Co-author: *Freight Transport, Urban Transport, Rural Transport, Economic Aspects, Infrastructure Provision, Pricing, Taxation and Financing Tools*
Peer review: *EU Accession Issues, Intelligent Transport Systems, Regulation/ Deregulation*

Damian Stantchev, Institute for Transport Studies, University of Leeds (ITS); UK
Mr Stantchev holds a degree in Economics and Trade from Varna University of Economics in Bulgaria and an MA in Political Science from the Central European University in Hungary. His early research experience was in the area of small business development in transitional economies of Central and Eastern Europe. Damian has also contributed to an extensive report on the role of the logistics and transportation sector in society for the Logistics & Transportation Corporate Citizenship Initiative of the World Economic Forum. His research for a doctorate examines the role of logistics in enhancing the competitiveness of the regional economy and encompasses all aspects of original research and data collection including the design, conduct and analyses of large scale surveys as well as the collection of commercial data and development of case studies.

Main author: *Passenger Transport, Land Use Planning, Equity and Accessibility*
Peer review: *Freight Transport*

Andrew Winder, ISIS; France
Mr Winder is a transport planner with a BSc in transport management (Aston University, England) and over 15 years experience in consultancies and public transport authorities covering transport planning and policy, particularly at UK, French and Europe-wide levels. Since 1998 he has been a senior engineer at ISIS, responsible for a wide range of European projects focusing primarily on Trans-European Networks, ITS for road traffic management, urban and regional public transport and EU enlargement aspects.

Main author: *Road Transport*
Peer review: *Passenger Transport, Urban Transport, Other Modes, Equity and Accessibility, Infrastructure Provision*

Ard Wolthuis, Università di Roma "La Sapienza", DITS; Italy
Ard Wolthuis graduated in Science & Innovation Management, in the field of Transport and Mobility, from the University of Utrecht. He has been involved in transport projects and analysed socio-economic, environmental, political and legal aspects, such as the Phileas project, the Fokker bankruptcy, and innovation policy of companies in the Netherlands. Has participated in a European project on innovation in urban public transport systems. Since spring 2005 has joined DITS as a research fellow. His main areas of activities are policy analysis and dissemination of research results.
Co-author: Efficiency, Decision-support Tools

Dr Zhaomin Zhang, ANAST – University of Liege, Neptune; Belgium
Dr Zhang has got the university degrees of Civil Engineering, Mechanical and Marine Engineering; Master of Transportation Sciences and Doctor of Philosophy. He is a senior engineer and led the important projects related to the "Establishment of a mathematical traffic model on the Belgian waterway network" (Belgian national research program "Transport and mobility"), the project called "On computerisation and management in real-time of operations relating to the exploitation of fluvial traffic to organise the waterway transport", Belgian Regional Ministry of Public Works) and the Project related to the development of a transport cost model in the inland navigation sector. He has also been involved in numerous simulation and operation research activities.
Peer review: Decision-support Tools