RESULTS OF THE EDC - SURVEY 1998

PART 2:

STATUS AND PRIORITIES OF TRANSPORT TELEMATICS DEPLOYMENT IN EUROPEAN CITIES AND REGIONS

prepared by:

RUPPRECHT CONSULT
— FORSCHUNG & BERATUNG GMBH —

Siegfried Rupprecht
Kemperbachstrasse 55
D - 51069 Köln
Germany
Tel. +49.221.689.72.54
Fax +49.221.689.72.55
Email srupprecht@netcologne.de

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EXECUTIVE SUMMARY

This survey of local and regional transport authorities was conducted in the context of the European Digital Cities Project (EDC). EDC is a support action of the European Union within the Telematics Application Programme (TAP) with the specific aim to monitor the status of local telematics deployment and to identify future needs and priorities of local authorities.

This report reviews the results of a questionnaire survey conducted during summer 1998 among decision makers in transport authorities in all 15 European members states.[1] Its specific objectives were to investigate goals and perception of telematics, technologies and applications used, status and plans of service deployment, benefits and obstacles, partnerships and business models for transport telematics deployment in local and regional authorities.

Methodology and representativeness

For the purpose of this survey a representative database of decision makers was set-up which was designed to be representative in terms of authority size within countries and to reflect the share of each country's population in Europe. Effectively all cities above 100.000 and a random selection of smaller authorities was included in the database. In addition, contact databases of major local authority networks (Car Free Cities, Eurocities and POLIS) were used to create a sub-set of the overall sample.

An in-depth questionnaire was sent in the five major European languages to 908 individuals and online versions were made available. A 20% return rate could be achieved by several reminders.

The total of 187 returned questionnaires is identical to 4% of all European local and regional transport authorities. Due to different return rates between countries, especially the United Kingdom is over-represented and France and Italy are under-represented (imbalances of smaller countries are without any serious effect in absolute terms). In general the survey can be considered as reasonably representative of European local and regional transport authorities and is certainly the best currently available quantitative reference source to authorities' transport telematics implementation in Europe.

In order to compensate for remaining imbalances, however different segments of the sample have been analysed separately and are reported whenever any significant differences materialised. These segments are population size, geographic position (Northern Europe vs. Mediterranean countries) and membership in European networks.

Main transport problems

As a starting point for analysis, main transport problems of European cities and regions were identified:

- The rising levels of private car traffic is the key worry of transport decision makers. This is even more acutely observed in the North of Europe (although "objectively" the real situation is reverse).
- High importance also have improvements in infrastructure, enhancement of the quality and quantity of public transport provision, re-enforcing the importance of integrated transport planning/ putting an emphasis on sustainable transport priorities, improving traffic management

[1] Also available are reports of a general telematics and environment telematics survey conducted within the EU and comparable transport and environment telematics surveys among Central and East European authorities.

- At the same time the worst negative effects need to be tackled: safety and improvement of environmental quality (especially air). Both points are considered more important among respondents in the North of Europe.

- Financial and institutional problems are surprisingly low on the list.

- The mentioning of "freight transport" points to an important sector, although again at low perceived priority.

There are substantial differentiations between cities of different sizes. Lacking infrastructure and financial problems are felt to be more acute in smaller cities, while larger authorities consider the need for integrated planning, institutional problems higher. The also feel the negative effects of rising private mobility much stronger (in terms of congestion and environmental pollution).

Network members and non-members are not significantly different in their perception of problems. Other (obvious) differences in perception are due to the general policy orientation of authorities (e.g. role of telematics in strategy, emphasis on environmental policies).

Policy measures to tackle these problems were found to be closely linked to promoting sustainable transport and to put priority to environmental considerations (more marked in the North of Europe and in larger cities and networking authorities). A substantial proportion of authorities are also in the process of setting up a "Local Agenda 21" and promoting transport awareness. A high surprisingly high interest for road pricing could also be identified.

On this background the course of investigation was targeted to establish the perceived "problem solving capacity" of transport telematics in terms of these key identified problems, especially for

- reducing congestion/ increasing the share of public transport/ generally managing demand

- using infrastructure more rationally

- improving public transport

- coping with environmental effects and improving safety

Perceived impacts of transport telematics

Transport decision makers are only moderately optimistic in general on the "problem solving capacity" of telematics solutions. However, for some of their key concerns (especially in relation to using transport infrastructure more efficiently and improving the public transport system) significant impacts are expected.

Scepticism is more widespread for the most relevant transport problem, the need to bring about a modal shift towards environmentally friendly mobility and to reduce negative air and safety impacts.

There is substantial insecurity how telematics implementations will in balance affect the demand for travel.

Strategic role of transport telematics

Only about half of local or regional European transport authorities state that transport telematics is an important or essential element of their corporate strategy; this trend is stronger among networked cities

Although decision makers are personally moderately positive on the transport impacts of telematics, their authorities have (in their view) not sufficiently recognised its importance.

Transport telematics systems and technologies

The current level of telematics system deployment is highest in the area of traffic management. In 2 years three quarters of public authorities in Europe expect to have centralised traffic signal control in place, more than half will have implemented all key systems for advanced network management.

A similar situation will exist in the public transport area in terms of real-time information, VSCS and priority at intersections.

Deployment levels in the travel information area are significantly lower, but expected growth is high especially for real-time public transport information, although less for multimodal or collective driver information.

Demand management is the area of lowest implementation levels at the moment. Although relative growth will be very high, it will remain an area of modest overall deployment (with one third to one quarter of authorities having any traffic calming or access control measures).

New growth markets are Personal Digital Assistants, demand management systems, pollution monitoring and freight-related systems.

Regarding technologies, VMS is available in one quarter of authorities, but high growth is expected so that half of all European authorities will be using VMS in 2-3 years. The use of smart cards has grown enormously since the last EDC survey in 1996 and will also reach a 50% market penetration rate by 2001.

There are obvious geographic patterns in the current deployment of transport telematics systems and technologies, but these will be further reduced in the coming years to an extend where Mediterranean authorities cannot be regarded anymore as technology lagging behind the rest of Europe. Remaining differences should rather be regarded as an indication of other policy and technology preferences rather than different technological levels of progress.

Members of European Networks, such as POLIS, are clearly at the forefront of applying transport telematics systems. Future deployment plans will rather widen this gap, especially for the most advanced technologies.

Status of service provision

Two out of three European transport authorities are offering a remarkable range of information services. Most common are (electronically delivered) fixed public transport schedules (44% of all authorities). Real-time information is mainly provided for car drivers (parking and general traffic conditions), but less for public transport users (25 to 32%); near real-time information is available for road works and other planned incidents by 28% of authorities. Integrated and personalised information is rare.

There are no generally preferred media for transport service delivery, but target-group and mode-specific media profiles can be distinguished:

- VMS are the obvious choice for driver information as pre-trip information provision is still low, except for road works information where internet is already the dominant medium.
- public transport information is mostly delivered via kiosks and by telephone/ fax, although internet is already becoming the second preferred option (e.g. for fixed schedules).
- New services are increasingly delivered via several media.

Real interactive services are very rare, when on-demand public transport and ticket reservation (mostly for national rail) are disregarded. For example only 7% offer online parking space reservation.

Interconnection of transport services with other service areas is not very common (one quarter of authorities), but if existent, is done extensively and to areas which appear to be well linked to the travel task.

Benefits and obstacles

The key benefits of telematics service introduction for transport decision makers are related to an anticipated positive user reaction (higher general service quality and service integration for users), but less to internal or own benefits (e.g. costs, technical integration).

Main obstacles - apart from insufficient financial funds - are related to content (supplying up-to-date and relevant information) and expected low readiness to pay for new services. Technical, institutional and political problems are not regarded as key obstacles.

Transport authorities have little concerns when delivering information services. The only worries relate again to content and user friendliness, rather than transaction security or personal privacy.

Commercial and institutional aspects of deployment

Transport-related information and interactive services are mostly lacking a commercial approach:

- Most services are targeted to the general traveller, i.e. target-group specific services for example for business travellers or tourists are rare, except as a "social function" for disabled or elderly people.
- Services are almost exclusively free.
- There is a marginal level of private sector participation in funding services. Reinvested revenues are not at all a common funding source.
- Private-public partnerships are restricted mostly to cooperation with ICT suppliers (presumably for demonstrations and trials) or to semi-public organisations rather than service providers.

However readiness to co-operate with the private sector is strong and most transport decision makers expect a strong role for private businesses in the future.

The key perceived obstacle for stringer private-public cooperation is the difficulty to establish a clear business case for new services.

Geographic differences are not particularly relevant. However network members are more active in private-public cooperation, but this appears to be linked to demonstrations rather than full commercial services. Due to their technical pioneering role they are also more dependent on public research funding. They are not pioneers in terms of their business approach.

Cooperation on the European level is generally considered as positive. However large authorities are much more successful to become involved in European RTD programmes.

Network membership appears to be almost an essential pre-condition of European programme participation.

1 BACKGROUND AND METHODOLOGICAL APPROACH

1.1 CONTEXT OF EUROPEAN DIGITAL CITIES PROJECT

The European Digital Cities Project (EDC) is a support action of the European Union within the Telematics Application Programme (TAP) to support European cities and regions in the deployment of new economically and socially sustainable telematics applications. Its specific role within the TAP is also to monitor the status of local telematics deployment and to identify future needs and priorities of local authorities.

Part of the approach to these tasks was to conduct questionnaire surveys among local and regional decision makers in 1996 and 1998. This report reviews the results of the 1998 transport survey. Its specific objectives were to investigate the following features of telematics deployment in European cities and regions:

- goals and perception of telematics
- technologies and applications used
- status and plans of service deployment
- benefits and obstacles
- partnerships and business models

1.2 ABSTRACT OF METHODOLOGY

Details of the methodological approach for conducting the survey are available in Annex 1. In summary the following steps were performed to ensure a state-of-the-art approach to the survey:

- Step 1: Set up of representative databases
- Step 2: Questionnaire design
- Step 3: Questionnaire mailing
- Step 4: Return control and reminders
- Step 5: Data entry and analysis

For the purpose of this survey a representative database of decision makers was set-up which was designed to be representative in terms of authority size within countries and to reflect the share of each country's population in Europe. Effectively all cities above 100.000 and a random selection of smaller authorities was included in the database. In addition, contact databases of major local authority networks (Car Free Cities, Eurocities and POLIS) were used to create a sub-set of the overall sample.

An in-depth questionnaire was sent in the five major European languages to 908 individuals and online versions were made available. A 20% return rate could be achieved by several reminders.

1.3 SURVEY RESPONSE

1.3.1 OVERALL

The total of 187 returned questionnaires is identical to 4% of all European local and regional transport authorities. Due to different return rates between countries, especially UK is over-represented and France and Italy are under-represented (plus some smaller countries, which are without any serious effect in absolute terms; c.f. Annex 1).

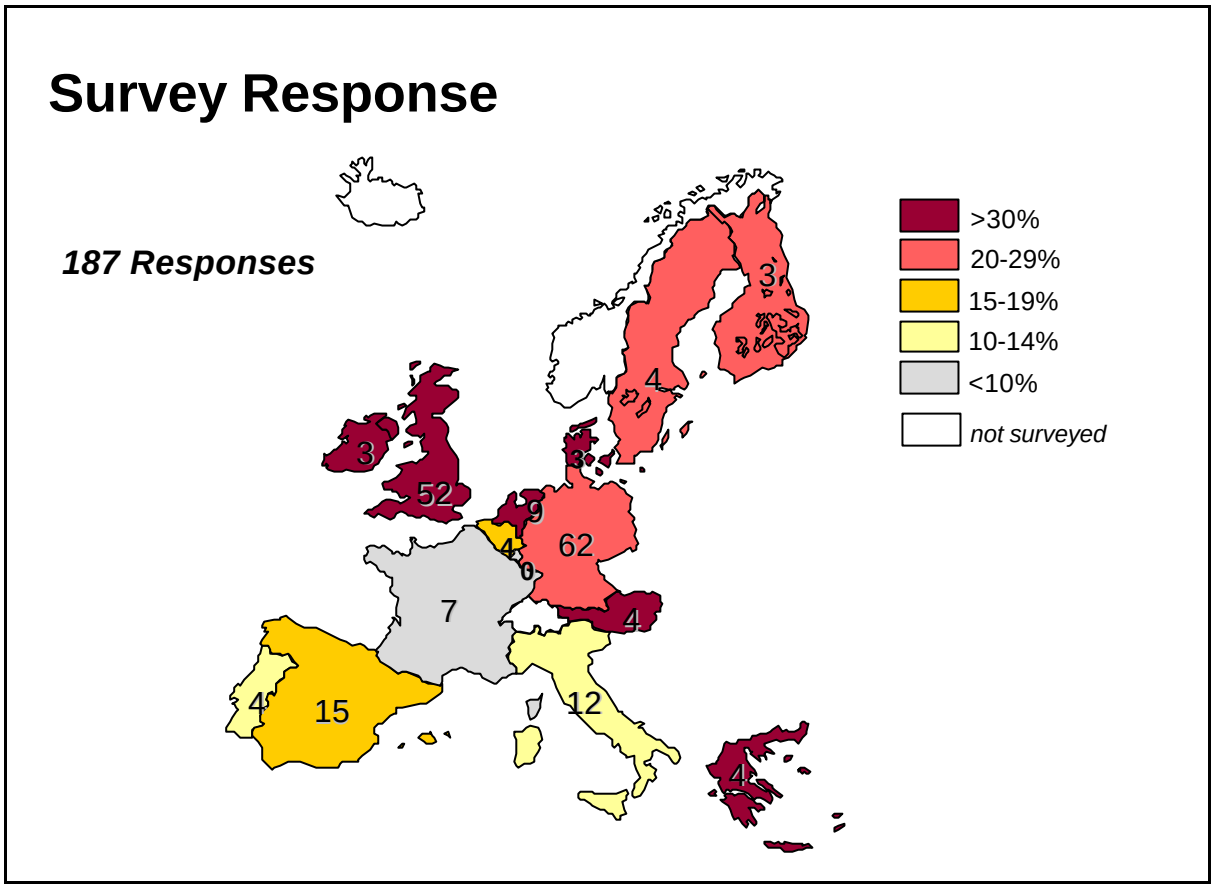


Figure 1 Number of Received Transport Survey Questionnaires by Country

1.3.2 COMPARISON TO 1996 EDC SURVEY

Compared to the survey undertaken in 1996 the achieved number of questionnaires is almost more than two times larger (90 returns in 1996 vs. 187 returns in 1998). This is due to the systematically researched contact database and a larger number of language versions.

Although efforts were made to retain a fair amount of comparable questions between the 1996 and the 1998 surveys, results are not very well comparable due to the specific response patterns:

- for the 1996 survey representativeness had not been assured, it was mailed mainly to networked cities (only 21% of respondents were not allocated to Car Free Cities, Eurocities, POLIS or Telecities)
- the 1998 survey is not focused on networked cities (with 67% not being network members) and can be considered as fairly representative on the European level (cf. next section).

Therefore, the analysis in this report is necessarily limited to only occasional comparisons between results in the 1996 and 1998 surveys.

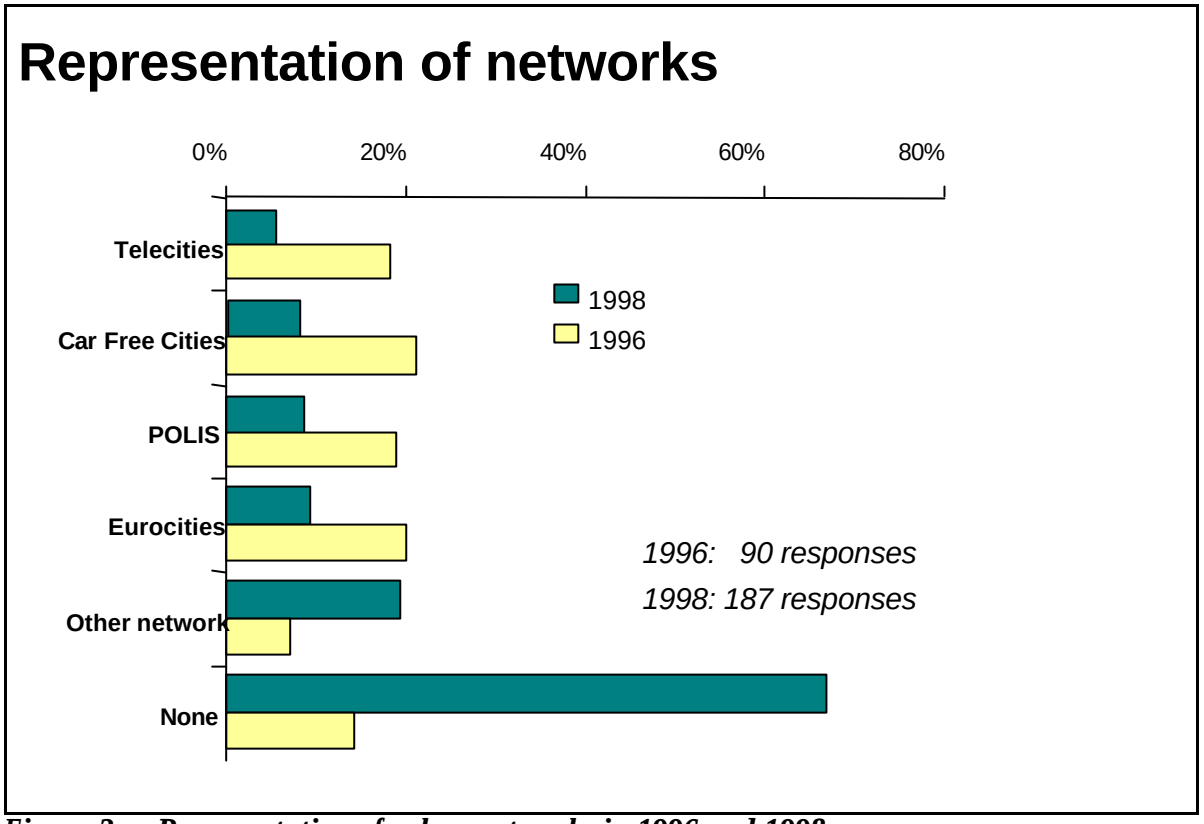


Figure 2 Representation of urban networks in 1996 and 1998 surveys

1.3.3 OVERALL REPRESENTATIVENESS

Full information on representativeness of the 1998 EDC Survey is given in Annex 1.

In general the survey can be considered as reasonably representative on the European level and is certainly the best currently available quantitative reference source to local authorities' transport telematics implementation in Europe.

In order to compensate for any imbalances, however different segments of the sample have been analysed separately and are reported whenever any significant differences materialised. Segments are population size, geographic (Northern Europe vs. Mediterranean countries) and European network members vs. non networking authorities.

This approach fully balances any shortcomings in full representativeness on geographical or authority size level as well as any bias resulting from the specific role of networked cities in the EDC Survey.

2 ROLE AND IMPACTS OF TRANSPORT TELEMATICS

As a starting point for researching awareness and practice of telematics solutions in transport authorities it was decided to enquire about decision makers' personal views and perceptions.

2.1 KEY URBAN PROBLEMS

Initially respondents were asked to indicate their city's/ region's largest transport problems in general in order put the subsequent specific questions into the overall policy context: "Q8. What do you feel are currently the three largest transport problems in your own city or region (in order of priority)?"

Respondents could put down three items in free text. For analysis they were grouped into discreet categories.[2]

Not surprisingly, the single problem perceived as most severe in the area of transport is the continuing growth of private transport and its directly related effects of congestion which holds the concrete thread of authorities not being able anymore to guarantee sufficient levels of personal mobility. One third of all respondents mentioned this as the most important item.

Somewhat surprisingly, the lack of infrastructure (almost exclusively in terms of quantity) is still considered as a substantial problem (although its extension is not necessarily the preferred solution of many, as following sections show). Its dimensions are (in order of relevance):

- road infrastructure
- parking space
- infrastructure generally (unspecified)
- public transport infrastructure

The third tier of top-priority problems is related to public transport operation and more generally to the need to managing transport demand, and of promoting public transport.

Finally there is a list of other items, including safety concerns, lack of transport planning and integrated policies, general financial problems, the need improve traffic management, freight transport, environmental effects of transport (air, noise), institutional problems, lacking transport awareness.

In detail, the most pressing problems are as follows:

[2] No attempt has been made to separate different levels of response (phenomena, reasons, solutions).

Table 1 Most pressing transport problem (personal view of decision makers)

Most pressing transport problem (i.e. first priority)	**Percent**
congestion, traffic growth, increased car use, ensuring mobility	36
road infrastructure	11
improve public transport operation/ quality	6
lack of parking/ parking management	6
other/ not transport related	6
managing transport demand/ need to promote public transport	6
safety concerns	5
lack of transport, integrated/ sustainable transport policy	5
financial problems (general)	4
improve traffic management	3
lack of infrastructure (general)	3
freight transport	3
Environmental effects of transport (air, noise)	3
institutional problems	2
transport awareness	1
public transport infrastructure	1
Total	**100**

Considering also statements for the second and third largest transport categories, this initial picture is confirmed:

Table 2 The three largest transport problems (all priorities)

Transport Problems (categorised)	Percent
traffic growth and congestion	64
lack of infrastructure (all categories)	35
public transport operation/ quality	31
traffic safety	17
Environmental effects	17
planning and integrated policy	10
traffic management	8
financial problems	8
freight transport	6
Institutional problems	5
other/ non-transport	20

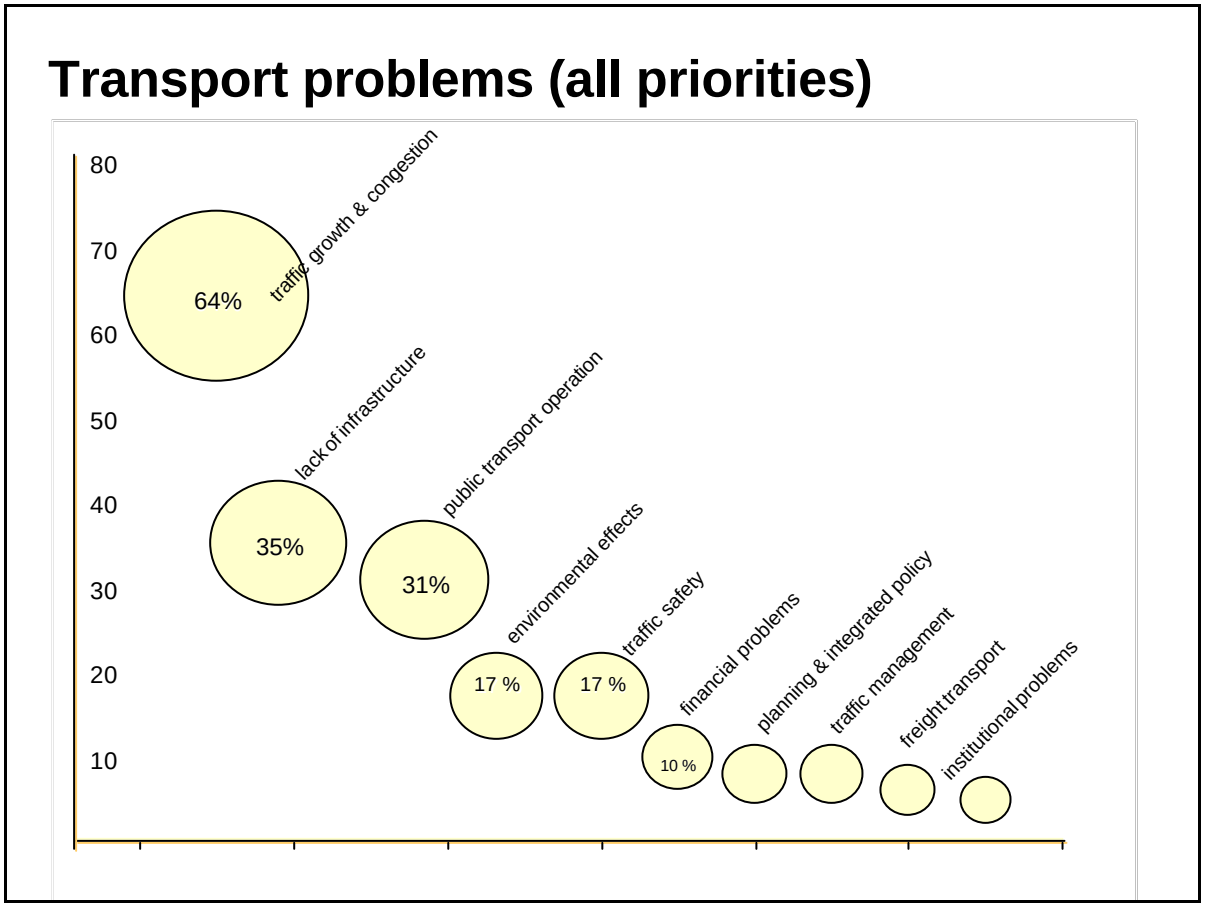


Figure 3 Largest problems in cities/ regions (personal view of decision makers).

Summary

The rising levels of (private) traffic is the key worry of transport decision makers. This is even more acutely observed in the North of Europe (although "objectively" the real situation is reverse).

High importance also have:

- improvements in infrastructure, which is more felt as a problem in the South of Europe
- enhancement of the quality and quantity of public transport provision
- re-enforcing the importance of integrated transport planning/ putting an emphasis on sustainable transport priorities
- improving traffic management

At the same time the worst negative effects need to be tackled: safety and improvement of environmental quality (especially air). Both points are considered more important among respondents in the North of Europe.

Financial and institutional problems are surprisingly low on the list.

The mentioning of "freight transport" points to an important sector, although again at low perceived priority.

There are substantial differentiations between cities of different sizes. Lacking infrastructure and financial problems are felt to be more acute in smaller cities, while larger authorities consider the need for integrated planning, institutional problems higher. The also feel the negative effects of rising private mobility much stronger (in terms of congestion and environmental pollution).

Network members and non-members are not significantly different in their perception of problems. Other (obvious) differences in perception are due to the general policy orientation of authorities (e.g. role of telematics in strategy, emphasis on environmental policies).

Relevance of findings

On this background it will be essential in the next section to investigate in how far telematics-based solutions are perceived as contributing to the remediation of these key problems. In other words, when investigating the acceptance of transport telematics measures it will be essential to establish their perceived "problem solving capacity" in terms of the key identified problems, especially:

- reducing congestion/ increasing the share of public transport/ generally managing demand
- using infrastructure more rationally
- improving public transport
- coping with environmental effects and improving safety

i.e. the key identified problems.

2.2 POLICY BACKGROUND

In order to gain some more insight into the background of urban and regional transport problems further questions were asked:

- Q17. Generally, what priority is your administration giving to environmentally-friendly (or „sustainable“) development in the area of transport?
- Q18. Has your authority set up a plan for „Local Agenda 21“?
- Q19. Are you taking any action to increase public awareness of environmentally friendly transport?
- Q20. Regarding the demand for travel, what impacts are you expecting from the introduction of transport telematics systems in your area?
- Q21. Is your authority considering implementing a road or area pricing scheme?

The responses to these questions are analysed in the following sections.

2.2.1 SUSTAINABLE TRANSPORT

Priority to environmental transport

There is a clear orientation among European transport authorities to give priority to environmentally friendly development of the transport system. Only a minority (13%) state that this is of "little practical relevance", whereas for two in five authorities it is "the first priority" in their policies and the remaining half allocate some "intermediate importance".

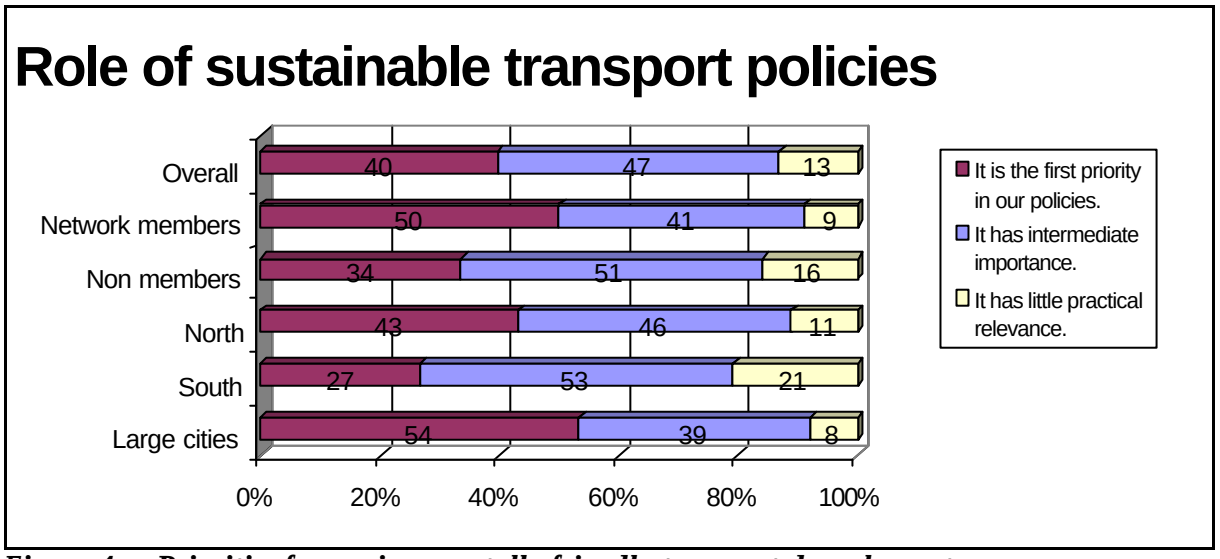


Figure 4 Priorities for environmentally friendly transport deveolpment

There are however clear differences in terms of size, geographic position and network membership:

- the adverse effects of traffic on large cities (500.000+) are apparently so enormous that they are much more in favour of sustainable transport
- environmental awareness appears to be higher in the North as in the South
- network members are more oriented towards sustainable transport (even if they are from the South or small or medium-sized)

Setting up a "Local Agenda 21"

„Local Agenda 21“ (LA21) appears to become a very successful concept. Half of all responding authorities claim to have defined a Local Agenda, another quarter say that they are planing to set one up "in the next one to two years".

Geographic differences are significant: Supposing that all current plans for LA21 would be put into practice, 83% of all Northern, but only 56% of all South European authorities would have a Local Agenda 21 in two years time.

2.2.2 AWARENESS RAISING

Question 19 ("Are you taking any action to increase public awareness of environmentally friendly transport?") confirms the previous findings:

- Half of all urban and regional authorities are promoting sustainable transport concepts among their citizens, another quarter are planning action in the immediate future.
- There is a clear North-South divide with the South being less active in promoting sustainable transport.

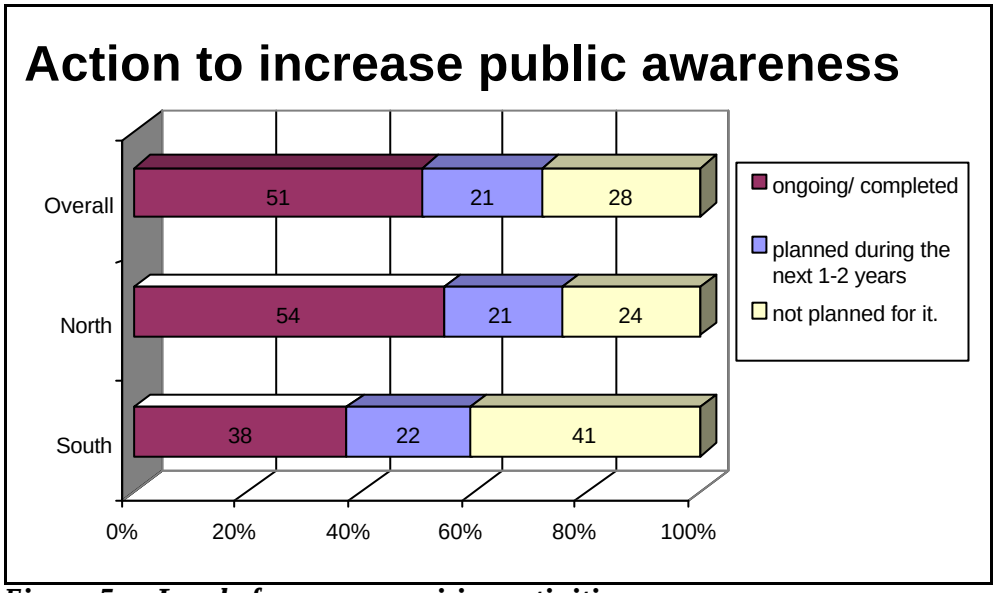


Figure 5 Level of awareness raising activities

2.2.3 ROAD PRICING

Road pricing is although not a novel concept, rarely used by urban authorities mainly due to its political sensitivities among voters. In the last few years interest has however risen sharply. The question whether an authority is considering to implement a road or area pricing scheme, was included in the EDC Survey as an indication of transport authorities readiness to consider drastic demand management measures.

Overall, three quarters of authorities are not currently considering road pricing (and have neither taken an interest in the past). A minority of three authorities, or 2 % have given up earlier plans unsuccessfully. However, there is substantial wider interest: One quarter of European cities are considering the possibility of road pricing, although few (five, or just over 3 %) have had any previous experience.

Again, there are significant differences within the sample:

- The proportion of interested cities in the South is significantly higher than in the North and is based on a broader previous experience.
- The interest among network members in road pricing is intensely high at 42%.

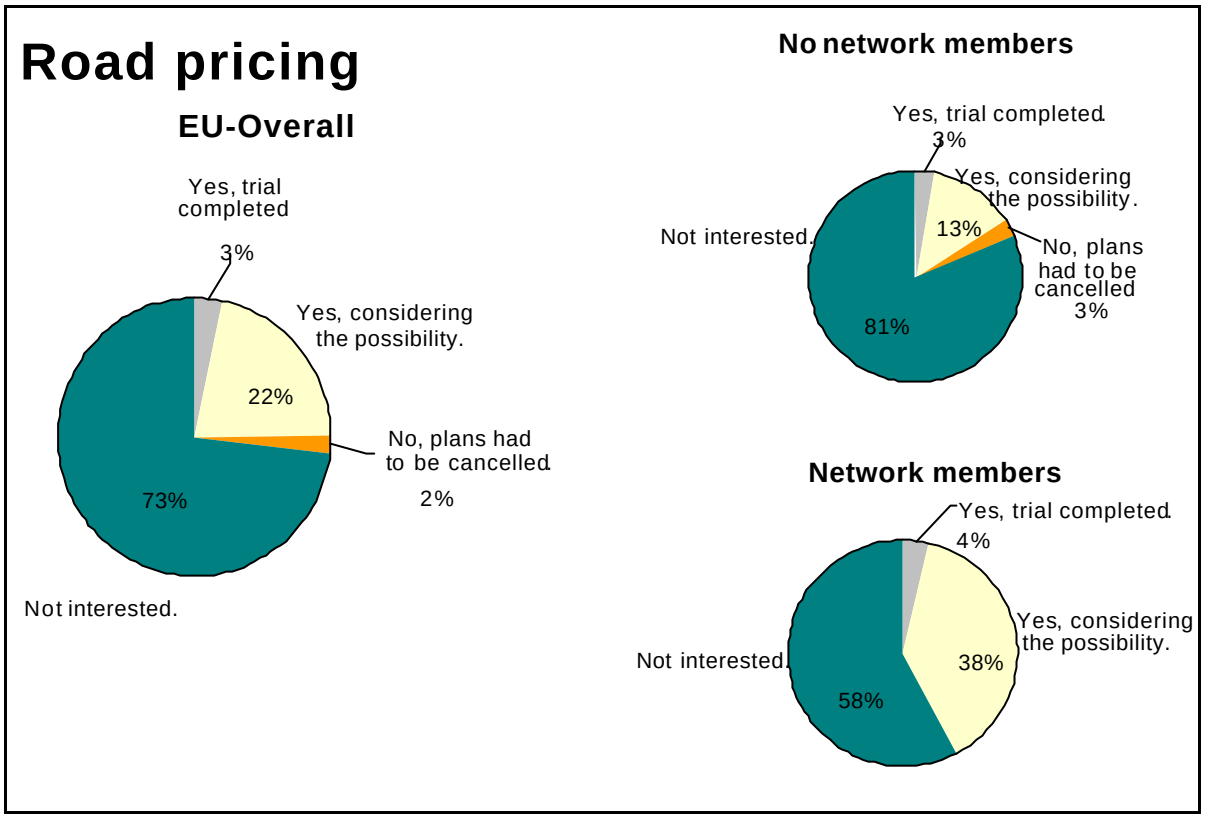


Figure 6 Plans for Road Pricing

2.3 PERCEPTION OF IMPACTS

2.3.1 KEY IMPACTS OF TELEMATICS

On the background of the previous chapters, the relevance of telematics solutions can now be investigated. Respondents were asked "What do you personally believe the impact of modern technologies might be in the next 2 - 3 years?" (Q7). A list of 16 items was given and respondents were asked to indicate the relevance of each item as low, moderate or significant.

Table 3 compares the "high" and "low" ratings. Apparently, there is a clear dividing line between high and low impacts plus one item where decision makers are split in two "factions":

The majority of decision makers expect a significant impact from transport telematics in the following areas:

- access to mobility information and services (although not an "effect" *per se* there is substantial belief that telematics will generate a number of new information sources and services)
- quality of public transport services

- reliability of public transport services
- efficient use of transport infrastructure

These areas are much in line with some of the previously identified concerns of transport decision makers. As key problems the rational use of infrastructure (mentioned by 35%), and the need to improve public transport operation/ quality (mentioned by 31%) were identified.

The "problem solving capacity" of transport telematics for the major area of concern ("reducing congestion/ increasing the share of public transport/ generally managing demand" mentioned by 64%) is considered as less positive:

- Whether transport telematics can significantly help to manage transport demand more efficiently, is a controversial question. One third of decision makers are positive, another third are sceptical, and the remainder expect "some benefits".
- For other key aspects (accessibility of activity centres, levels of public transport use, facilitating the shift to environmentally friendly modes) only a minority of 16 to 26% are positive).

Of substantial concern to respondents was also the need to cope better with negative environmental effects and to improve safety (both mentioned by 17%). Only one in five respondents believe that there will be significant change due to telematics in these areas.

A particularly high number of negative statements were provided for the item "mobility of disabled and elderly people".

As implied already by these figures the overall average impact of telematics for all items was considered to be "moderate (i.e. some benefits are expected)".

However some qualifications of this overall result are necessary:

- Respondents in Southern authorities are considerably more positive for all items. Differences are greatest for safety, restricting access, demand management, and public transport quality.
- Network members are also more positive (for the same areas) than non-members even if differences are not as great as in geographic terms. However, networking authorities are less optimistic than others in expectations for increase public transport patronage, and generally improved cost-benefit ratios in transport services. Whether this is due to real experiences (e.g. from trial applications) or higher expectations could not be established.

Table 3A Perceived impacts of transport telematics

	low	**significant**
access to mobility information and services	15	56
quality of public transport services	17	44
reliability of public transport services	19	35
efficient use of transport infrastructure	18	30
efficient management of transport demand	***30***	***32***
enhanced traffic safety	31	20
efficiency of freight deliveries	33	20
levels of public transport use	35	18
Accessibility of activity centres	37	26
reduction in air and noise pollution	40	20
increased cost-benefit ratio in transport services	40	17
facilitating the shift to environmentally friendly modes	40	16
energy efficiency in transport	41	21
Controlling/ restricting access to sensitive areas	43	22
mobility of disabled and elderly people	48	16
revenues from charging for road use[3]	61	17

[3] The low rating for "revenues from charging for road use" is clearly due to the described low overall acceptance of road pricing. In addition, revenue generation is not its prime motif.

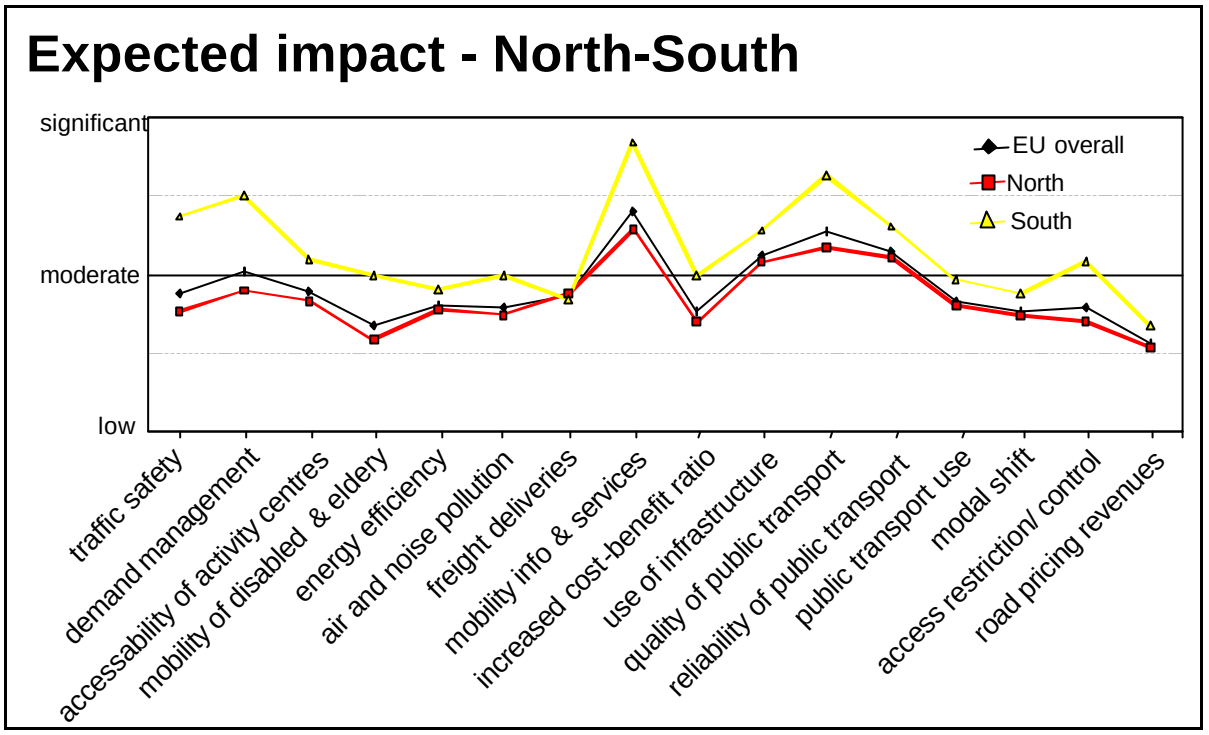


Figure 7 Perceived impacts of transport telematics

2.3.2 TELEMATICS AND TRAVEL DEMAND

Question 20 asked specifically about expected changes in demand patterns: "Regarding the demand for travel, what impacts are you expecting from the introduction of transport telematics systems in your area?"

The answer to this essential question illustrates quite well the overall difficulty in judging the effects of new technology use in complex systems:

- One fifth of respondents assumes a reduction in travel demand, almost the same amount an increase, but the vast majority expects "no change or more complicated effects".
- Network members, although clearly more inclined towards decreasing travel demand, are still undecided as much as others.
- In Mediterranean authorities, where generally expected impacts are more in favour of telematics solutions, still almost one third believes that travel demand will rise due to telematics introduction.

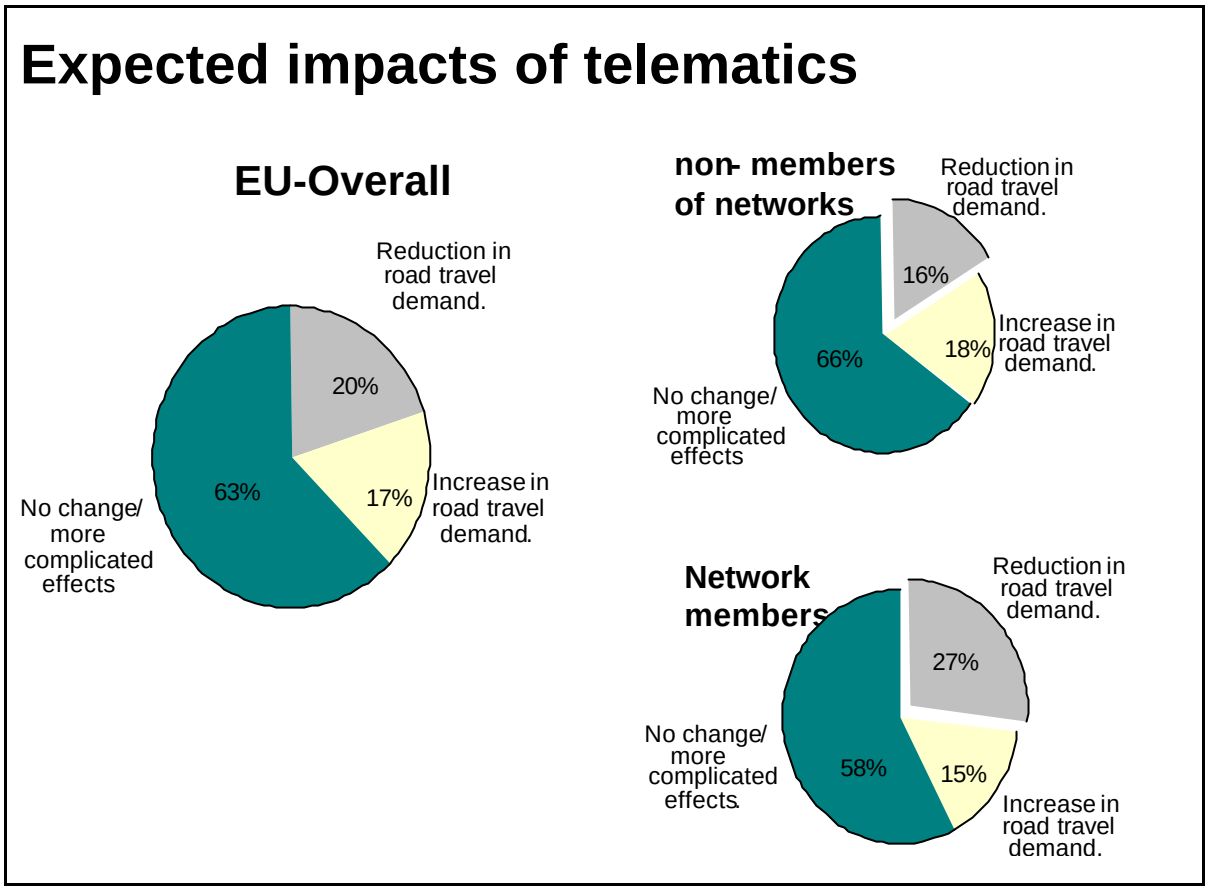


Figure 8 Expected impacts on travel demand

2.3.3 SUMMARY

In summary, it can be concluded that transport decision makers are only moderately optimistic in general on the "problem solving capacity" of telematics solutions. However, for some of their key concerns (especially in relation to using transport infrastructure more efficiently and improving the public transport system) significant impacts are expected.

Scepticism is more widespread for the most relevant transport problem, the need to bring about a modal shift towards environmentally friendly mobility and to reduce negative air and safety impacts.

There is substantial insecurity how telematics implementations will in balance affect the demand for travel.

2.4 STRATEGIC ROLE OF TRANSPORT TELEMATICS

This section deals with the "official" view of authorities, i.e. the role assigned to telematics in the corporate strategy. The following question was asked: "4. What is your authority's position on using and promoting telematics?"

Almost half of respondents state that "using and promoting transport telematics ... is not a major activity at the moment." While only less than one quarter regard it as "an essential component of our strategy." The remaining one third are giving "important, but not crucial" as an answer.

This is surprising in comparison to the general telematics survey where almost half of European authorities state that (generally) telematics is an essential component of their corporate strategy. Since implementation levels in the transport sector are (at least) not lower as in other activity areas of public authorities, this statement (made by transport executives) implies that the relative importance of transport telematics within the overall technology policy should be raised.

There is a significant geographic pattern, with northern European authorities being less convinced, than their Mediterranean counterparts. Recognition of the importance of telematics is also a function of city size.

Differences are even greater when distinguishing between network members and non-networked cities. Almost half of network members claim that telematics plays an essential role in their policy making, compared to only 10% for other cities or regional authorities.

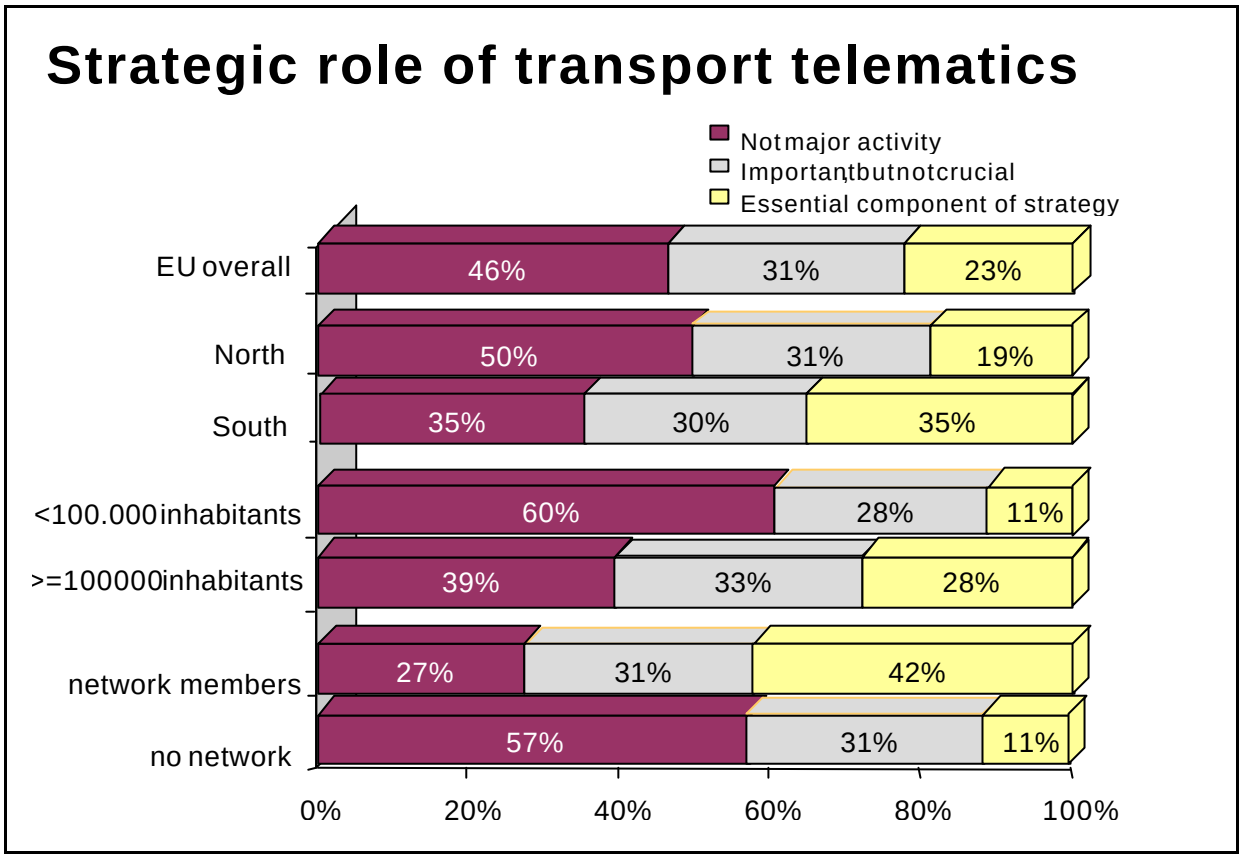


Figure 9 Authorities' position on using and promoting transport telematics

In summary, it can be assumed that:

- Only about half of local or regional European transport authorities state that transport telematics is an important or essential element of their corporate strategy; this trend is stronger among networked cities
- Although decision makers are personally moderately positive on the transport impacts of telematics, their authorities have (in their view) not sufficiently recognised its importance.

3 SYSTEMS AND TECHNOLOGIES

The key objective of the EDC Transport Survey 1998 was to investigate the status and future plans for telematics deployment in European transport authorities. Since there is a multitude of individual systems and applications available, the following approach was chosen.

1. First the use of some key transport telematics applications is investigated.

2. Then the implementation levels for a set of specific technologies are considered.[4]

3. The next section looks at information and interactive services provided to citizens and its communication media.

For each application or technology some key items were provided and respondents were asked to indicate which they are using "fully" or on a "trial basis", or - if they are not using them - to indicate whether they have plans to do so or not.

3.1 TRANSPORT TELEMATICS SYSTEMS

3.1.1 CURRENT STATUS

The current overall status and plans of transport telematics system implementation is visualised in figure 10. The figure indicates availability of technical systems by application areas.

On the application area level, traffic management and public transport are clearly the areas with most implemented systems. If all current plans were realised, between two thirds (co-ordinated traffic signal control) and half of all authorities will have the essential systems available in the next 2 years.

Travel information is a relatively new area of large-scale implementation. Even in three years time - priorities remaining unchanged - even key areas as collective driver information will be in operation only in one third of authorities. Information is and will be mostly public transport oriented, rather than directed to drivers or multi-modal travellers.

In demand management, as far as it will not be covered within traditional traffic control, implementation levels are currently lowest in comparison to all other areas. But although there will be a relatively high growth in the next years, only about one quarter of authorities will have essential systems available.

In other areas authorities are particularly well-equipped with pollution monitoring equipment. Although traffic control systems are quite widespread, this is less the case for urban - regional traffic control systems. Freight logistics are hardly available as fully developed systems.

[4] A wide definition of "technology" is adopted, including basic applications (e.g. email), systems (e.g. GIS) as well as genuine "technologies" as for example GPS.

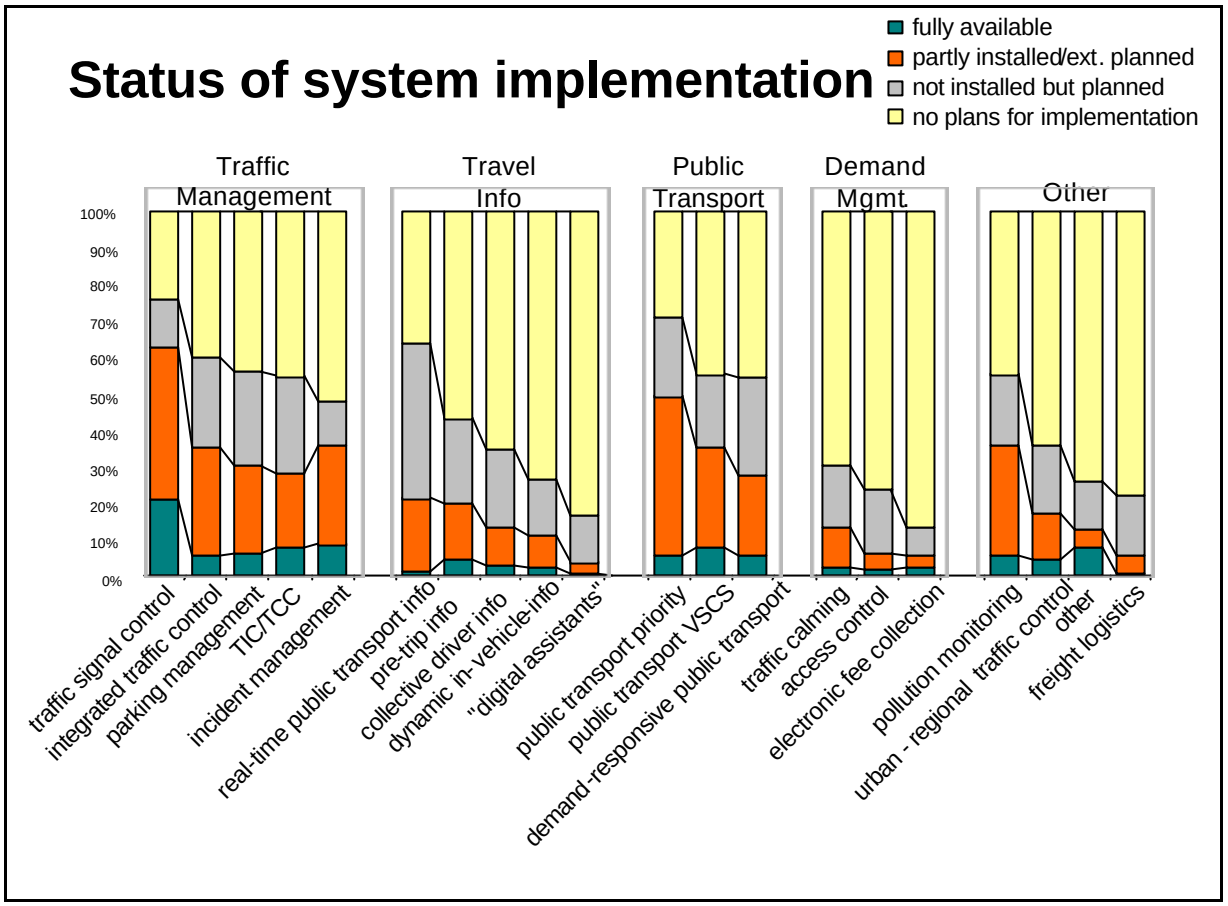


Figure 10 Status of transport telematics system implementation

Taking a closer look at the status of currently available systems (cf. figure 11), most widely available ("fully available" or "partly installed, extension planned") are currently:

- co-ordinated traffic signal control (63 %)
- public transport priority at intersections (49%)

Around one third of authorities has the following systems available: (each 35%)

- public transport vehicle scheduling and control
- pollution monitoring and information
- incident and emergency management
- integrated traffic control with public transport priority

as well as

- telematics-aided parking management (info and pricing) (30 %)
- traffic control or information centre (28%)
- demand-responsive public transport (27%)

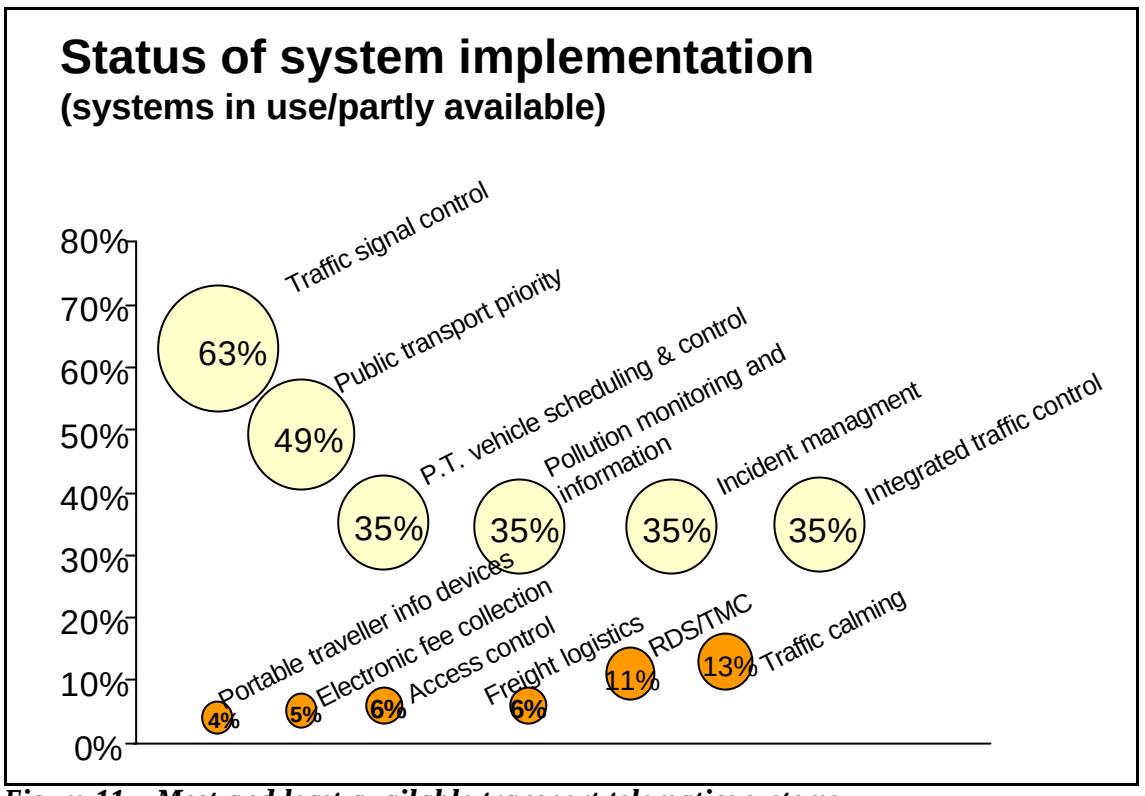


Figure 11 Most and least available transport telematics systems

Somewhat lower are implementation levels for:

- real-time public transport information (e.g. at stops) (21%)
- pre-trip information (e.g. videotext, Internet) (20%)
- co-ordinated urban – regional traffic control (17%)
- collective driver information and route guidance (13%)
- telematics-aided traffic calming (e.g. speed control) (13%)
- in-vehicle, dynamic information for drivers (e.g. RDS/ TMC) (11%)

Only a minority of 4 - 6% are operating systems in the areas of::

- freight delivery logistics (with telematics support)
- telematics-aided access control (e.g. in sensitive areas)
- electronic fee collection for road use
- portable traveller information devices (“digital assistants“)

Since 1996 "co-ordinated traffic signal control" and "pollution monitoring" have grown disproportionately.

3.1.2 FUTURE PLANS

Changing focus towards future implementation, results are in summary as follows:[5]

Public Transport

- 65% of transport authorities intend to extend their traffic control systems to give priority to public transport at intersections. This will however be mostly completion of existing systems.
- Mostly new systems will be installed in the area of real time information systems. This will be the largest 'new systems' growth area with 42% of respondents planning new systems.
- High growth can be expected in the area of vehicle scheduling and control systems (VSCS) with an extension/ new implementation by 58% and demand-responsive public transport by 50% of respondents.

Traffic Management

- New growth areas are Traffic Information and Control Centres (TIC/ TCC). 47 % of authorities plan extensions or establishment of new TIC's/TCC's.
- Similar levels will be observed in the area of parking information and management and integrated traffic control.
- There will still be substantial extension in signal control although only few new systems.

Travel Information

- There is lower overall demand in the travel information area (other than directly related to public transport). Growth in the pre-trip (39%) and collective driver information areas (32%) will be higher than in vehicle-based information systems (24%).
- For "digital assistants" (PDA's) growth in absolute terms will be small, but enormous compared to current levels (13% state an interest).

New growth markets

Particularly high relative growth rates (in addition to PDAs) will be observed for pollution monitoring systems (from an already high level) and demand management technologies and freight-related telematics applications (from a very low level).

Segmentation

There are a very clear geographic differences in future market growth patterns:

In Mediterranean countries growth rates will be remarkably higher for:

- incident and emergency management
- telematics-aided parking management (information and pricing)
- portable traveller information devices ("digital assistants")
- public transport vehicle scheduling and control

[5] Basis are statements for "partly installed, extension planned" and "not installed, but planned".

- telematics-aided access control (e.g. in sensitive areas)

Whereas in the North of Europe growth will be higher for:

- in-vehicle, dynamic information for drivers (e.g. RDS/ TMC)
- real-time public transport information (e.g. at stops)
- public transport priority at intersections
- pollution monitoring and information

Network members', especially POLIS members' intention to implement new systems is significantly higher than other authorities' in all areas, except in signal control where networking cities will soon reach full implementation. They will be further extending their systems from its already very high level. Highest relative growth can be expected for them in the most advanced systems.

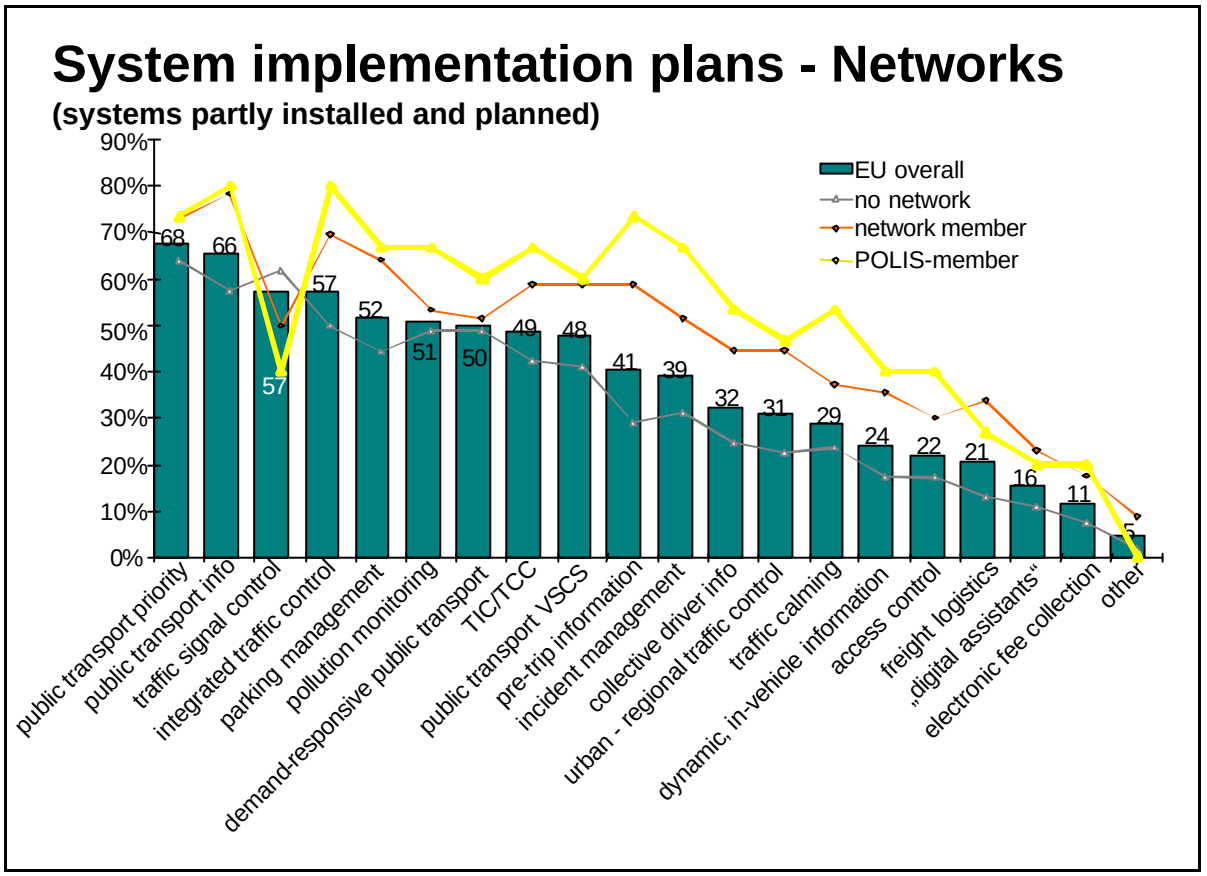


Figure 12 Stated plans for system extension/ new implementation

3.2 TECHNOLOGIES

From the large number of available "technologies" (in the widest sense) or "service platforms" a selection was put to respondents to indicate their availability (as in the question before). The selection focused on more recently used technologies.

3.2.1 CURRENT STATUS

Of the given list of technologies current overall levels of availability are very limited:

- VMS is used by one out of four transport authorities, most of them claim "full use" of the technology.
- Smart card use has spread very rapidly since the 1996 EDC Survey and current use is at 17%. Two thirds of these users however are running only trial implementations.
- RDS/TMC implementation is at 9%. This figure may include also some national RDS/ TMC implementations as the number of local trials is known to be very limited.
- One in ten transport authorities appears to be using GPS, although most on a trial basis only.
- Of the other given technologies little use is currently made.

Table 3B Current status and plans of selected technologies

	Percent of authorities* where technology is ...			
Technology	**fully or partly used**	**partly used or planned (i.e. future growth)**	**imple-mented in 3 years****	***not planned***
Smart cards	17%	44%	49%	*52%*
Variable Message Signs (VMS)	25%	30%	46%	*54%*
Satellite-based positioning (GPS)	10%	24%	26%	*71%*
Radio Data System/Traffic Message Channel (RDS/TMC)	14%	16%	25%	*73%*
Short Message Service (SMS)	5%	14%	15%	*79%*
Handheld terminals (e.g. Personal Traveller Assistants)	4%	10%	12%	*84%*
Digital Audio Broadcasting (DAB)	2%	12%	12%	*82%*
Dedicated short-range communication (DSRC)	8%	8%	12%	*89%*

* *Base for percentages is the total number of respondents to this question (N=147).*

** *Total of fully/ partly used and planned (i.e. available in the next 2-3 years).*

3.2.2 FUTURE PLANS

Expected growth in technology use will in future considerable change the magnitude and order of technology implementation:

- Smart cards are obviously the most interesting new technology to transport authorities. One third of all authorities plan to use them in the next two to three years. By 2001 half of all European authorities will have implementations (including pilots).
- Use of Variable Message Signs (VMS) will double. New installations are more limited; they are planned only by one in five authorities.
- Growth in systems using satellite-based positioning (GPS) can be expected in one quarter of authorities. Almost all of these systems will be new ones.

- RDS/TMC, SMS and DAB are expected to grow at about the same rates, although overall use may be still higher for RDS/ TMC.[6]
- Handheld terminals (e.g. Personal Traveller Assistants) are planned by only few authorities.
- Use of dedicated short-range communications (DSRC) will be growing least.

3.2.3 SEGMENTATION

Geographically, the following differences need to be kept in mind:

- Generally the range of used technologies and levels of usage are higher in Northern Europe, than in Mediterranean countries.
- In particular more use is made in the North of smart cards, RDS/TMC, SMS (currently almost exclusively used in Northern Europe) and DAB. Except for DAB, future growth will reduce this difference.
- DSRC is also currently more common in the North, but considerably higher growth in the South will lead to similar implementation levels.
- Levels of VMS use are similar, but demand for new systems will be stronger in the North.
- Both current use and future demand for GPS is much higher in South European countries.
- The interest in handheld terminals is much higher in the South, but future growth rates will be similar.

In terms of network membership, previous observations are confirmed:

- Network members are using advanced technologies considerably more than other authorities. The only exceptions are smart cards and SMS were levels are equal.
- Future plans of network members will maintain this difference, or even increase the gap for less widely used or most advanced technologies, especially DSRC, DAB, handheld terminals and SMS.

3.3 SUMMARY

The current level of telematics system deployment is highest in the area of traffic management. In 2 years three quarters of public authorities in Europe expect to have centralised traffic signal control in place, more than half will have implemented all key systems for advanced network management.

A similar situation will exist in the public transport area in terms of real-time information, VSCS and priority at intersections.

Deployment levels in the travel information area are significantly lower, but expected growth is high especially for real-time public transport information, although less for multimodal or collective driver information.

[6] This statement is obviously true when considering the levels of national RDS/ TMC implementations, but it cannot be ascertained to what degree it is valid for local and regional transport authorities, since there was an obvious mix of own implementations and local availability through national schemes.

Demand management is the area of lowest implementation levels at the moment. Although relative growth will be very high, it will remain an area of modest overall deployment (with one third to one quarter of authorities having any traffic calming or access control measures).

New growth markets are Personal Digital Assistants, demand management systems, pollution monitoring and freight-related systems.

Regarding technologies, VMS is available in one quarter of authorities, but high growth is expected so that half of all European authorities will be using VMS in 2-3 years. The use of smart cards has grown enormously since the last EDC survey in 1996 and will also reach a 50% market penetration rate by 2001.

There are obvious geographic patterns in the current deployment of transport telematics systems and technologies, but these will be further reduced in the coming years to an extend where Mediterranean authorities cannot be regarded anymore as technology lagging behind the rest of Europe. Remaining differences should rather be regarded as an indication of other policy and technology preferences rather than different technological levels of progress.

Members of European Networks, such as POLIS, are clearly at the forefront of applying transport telematics systems. Future deployment plans will rather widen this gap, especially for the most advanced technologies.

4 STATUS OF SERVICE PROVISION

This section examines which services are provided by authorities and on which technical platforms (including interconnection of individual applications). Target groups and conditions of use are investigated as supplementary information. The questions in the survey were:

- Q10. What transport-related information and services does your authority provide for travellers and drivers? Which technical platform are you using to deliver them? (Respondents were asked to include also joint services with other organisations; e.g. in-car information with private sector.)
- Q11. Do users have to pay for any of your electronic services (in addition to the usual price of the service)?
- Q12. Are there specific target groups for any of these services?
- Q14. Are any of your transport telematics services interconnected with any other services in the following areas?

Two types of services are investigated separately:

- "information" services where users can put a request, but cannot interact directly (e.g. a standard web page or VMS message)
- "interactive" services where users can request information, but can also provide feedback immediately as part of the service (e.g. a transactional web-based application or ordering a mini-bus via telephone)

In terms of delivery platforms a very wide approach has been chosen to include also non-internet technologies. The questionnaire contained a list of services (cf. Annex 2) for each item respondents were asked to specify the used dissemination media from the following list:

- videotext / minitel (for interactive services: "*(interactive)* videotext or minitel")
- own Internet site
- public access kiosks / terminals
- automatic telephone / fax services (fax not for interactive services)
- Variable Message Signs (not for interactive services)
- onboard equipment (not for interactive services)

During analysis it became obvious that respondents adopted a very wide interpretation of "automatic telephone / fax services". After checking some of the individual statements, it became obvious that this should be interpreted as any telephone-based information service (rather than strictly "automatic" call centre applications with voice recognition etc.) or as services based on providing information also by fax (not necessarily a "fax on demand" application). This is however not regarded as a serious restriction since the focus in this section is on "services" (i.e. content and relevant institutional infrastructures) rather than the degree of technological sophistication *per se*.

4.1 INFORMATION SERVICES

122 of the total of 187 respondents are providing at least one service. Consequently, at least two thirds of authorities are offering some sort of transport information by electronic means. The actual figure should be somewhat higher since some respondents may have "overseen" the question.[7]

4.1.1 MEDIA

On average, those authorities which are offering services indicated eight service-media combinations (e.g. for example four services delivered on two dissemination platforms).

There is obviously no single, most used medium for transport-related information services.

Superficially there appears to be a "competition" between kiosks, VMS, internet, telephone or fax-based services, each with about one third of responses. Videotext/ minitel and onboard services are only used by about one in ten authorities as dissemination media. In reality however there are specific service-media profiles (see below).

Table 4 Media used for information services

Medium	Percent of all* authorities
Public access kiosks	36
Variable Message Signs	35
Internet	31
"Automatic" telephone/ fax	30
Videotext/ minitel	15
On-board equipment	10

* This percentage is based on all authorities in the sample

There are some noteworthy differences to this pattern

- Use of videotext and internet is higher in the North, use of kiosks is higher in the South.
- Network members are more actively using any medium than other authorities.

[7] The question was somewhat complex to answer.

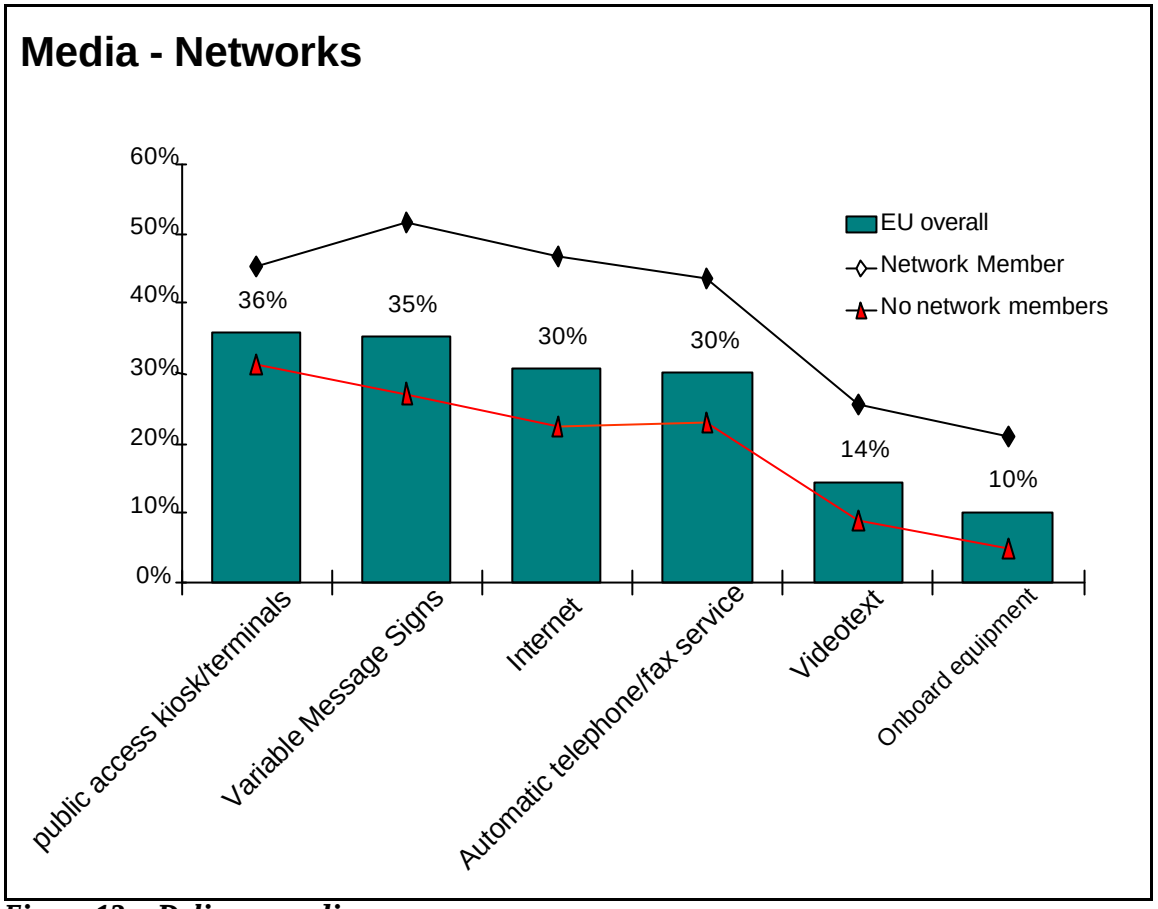


Figure 13 Delivery media

4.1.2 SERVICES

The survey has produced the following "hitlist" of information services.

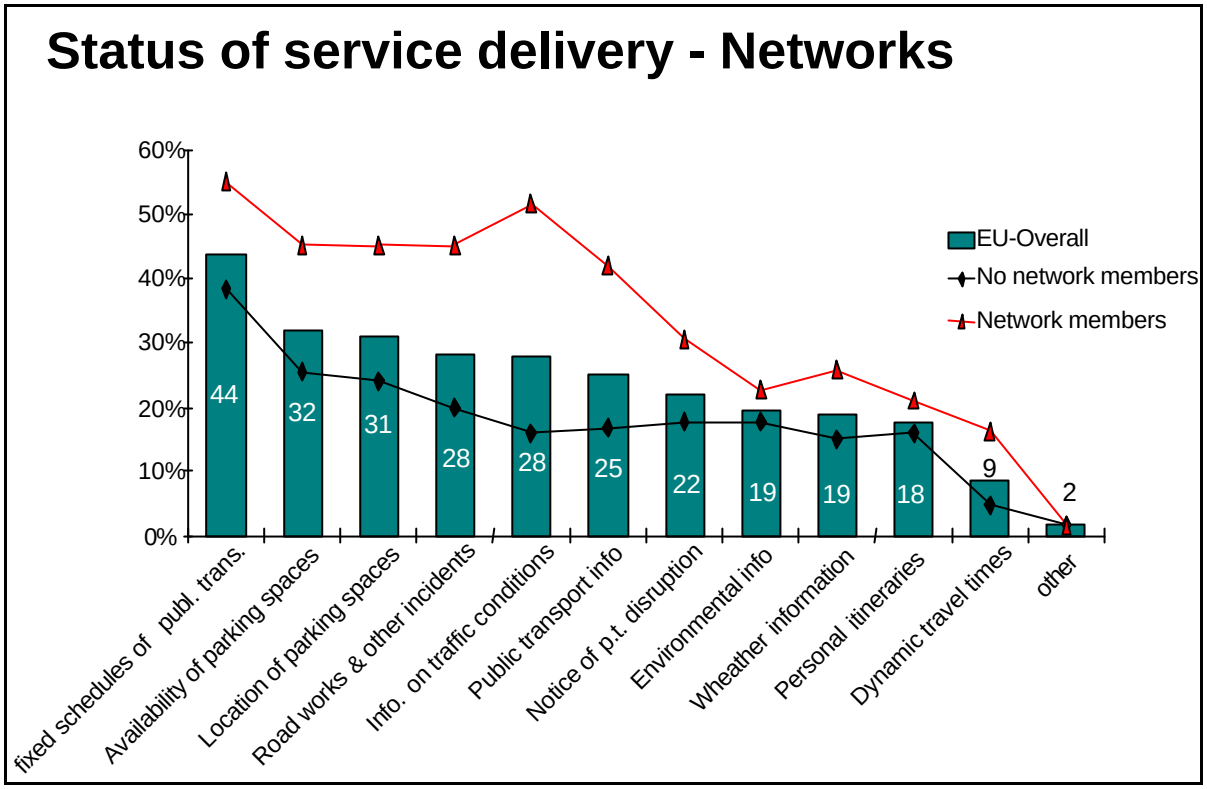
Overall, only around half of all authorities deliver any electronic transport-related information service.

The profile of information services by transport mode is as follows:

- Although fixed public transport schedules are the most often delivered service, real-time and near real-time information is only provided by about one quarter of authorities / operators.
- Most information services are targeted to car drivers. Parking-related information and general traffic conditions including road works are the most commonly provided services.
- Environmental and weather information are supplied by one in five authorities.
- Personalised information is rare (18%).

There are also some interesting geographic differences.

- The supply with dynamic travel times for road users, information on road works and the state of the environment is more widespread in the North.
- Public transport information (especially in real-time and advance notices of service disruptions) is higher in the South.



** 100% = all authorities*

Figure 14 Level of service delivery

Network members are again far more active in supplying information to transport users than other authorities. It is no exaggeration to state that, the more technologically ambitious a particular service, the larger the implementation gap between networking and other authorities.

The service profiles of the different media are given in figure 15. There are very clear distinctions:

- Not surprisingly, driver-related services are delivered mainly through VMS. However other media provide already alternative access points to relevant information. In particular internet has grown substantially, although traditional media maintain a very important position, except for videotext/ minitel which is declining in relative importance (compared to 1996).
- Public transport information is for the most part delivered via kiosks. But telephone and internet-based services are already viable alternatives for (near) real-time services.
- Environmental information is equally offered through all relevant media.
- Weather is a more traditional form of content and is the only service also offered on videotext at the same level as by telephone and internet. Internet is however already the main medium.
- More generally it can be observed that more recent information services are less media specific than more traditional ones. This is an indication of a multi-platform approach for the implementation of new services.

Table 5 Status of provision of information services (providers only)

Target group	Service	Percent of all service-providing authorities using the following media					
		kiosks	**VMS**	**tele-phone / fax**	**internet**	**video-text / minitel**	**on-board equip-ment**
drivers	real-time information on traffic conditions	9	***25***	14	12	7	8
	availability of parking spaces	12	***39***	7	8	3	3
	location of parking spaces	12	***34***	8	8	4	4
	current road works and other incidents	11	***12***	13	***18***	7	5
	dynamic travel times for road users	3	5	3	3	1	1
public transport users	fixed schedules of public transport	***43***	5	***25***	***27***	6	6
	real-time public transport information	***22***	9	***16***	7	3	3
	advance notice of public transport disruptions	***15***	3	***15***	***11***	6	3
	personal itineraries for multi-modal journeys	***12***	2	***12***	***8***	3	3
general	real-time environmental information	9	7	9	12	5	3
	weather information / forecasts	4	1	***12***	***14***	11	3

Note: The basis for percentages (=100%) are authorities providing any service.

In comparison to the general telematics survey the following differences should also be pointed out:

- The internet cannot be considered as the universal medium in the transport sector.
- There is a variety of well-covered services.
- Services, especially new ones are delivered via several media.

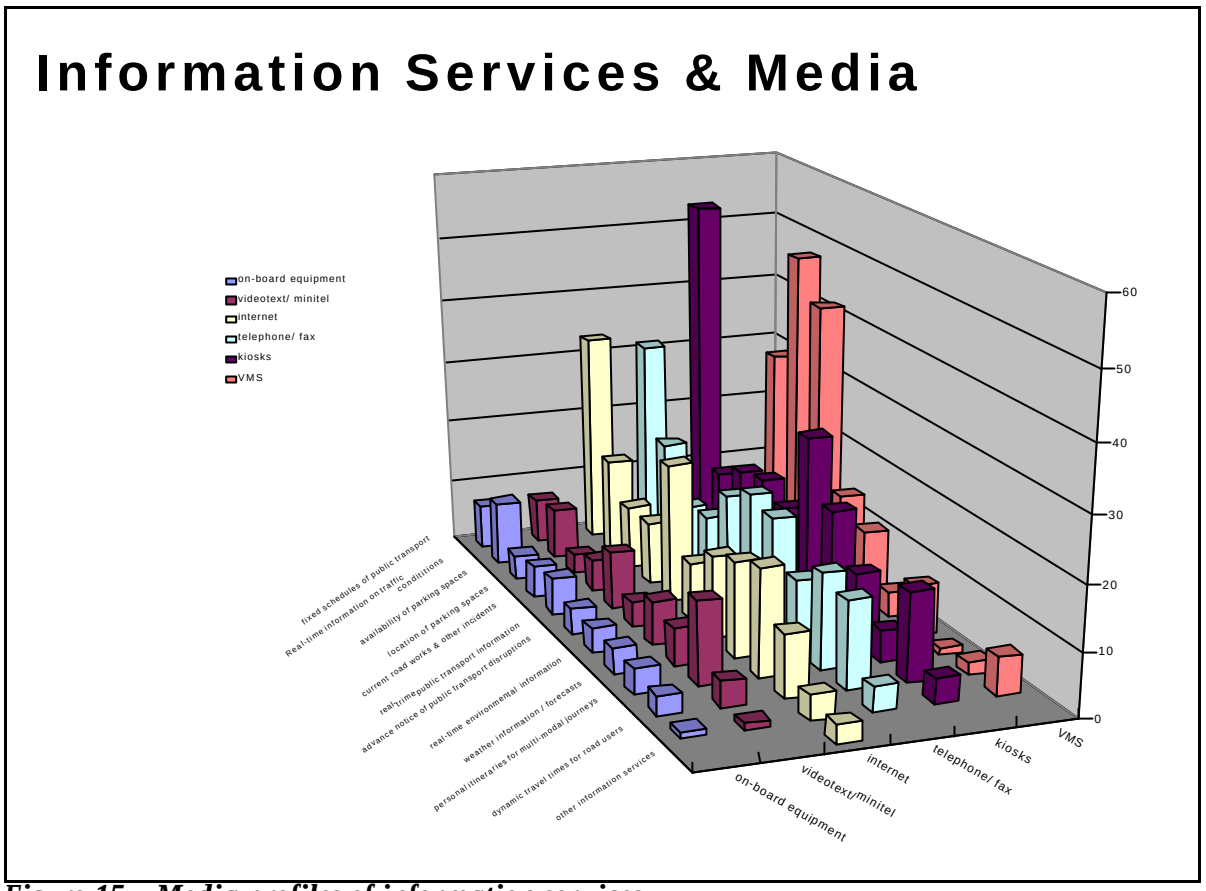


Figure 15 Media profiles of information services
(Note: The numerical basis of the figure is the total number of responses.)

4.2 INTERACTIVE SERVICES

The level of provision of interactive services is much lower as for purely "one way" information delivery. This is understandably due to the considerably higher amount of technical effort (especially in the "back office" area), as well as to security and privacy considerations.

Overall, almost half of all authorities (40%) are offering on average three interactive services.

The most used medium (across all services) was "telephone/ fax", indicated by two out three respondents who supply any interactive service at all. Kiosks are used by 59% (of interactive service providers). Surprisingly, internet is used only by 20%.

There are basically two relevant interactive transport services, both of which are related to public transport (and both are offered by almost half of all interactive service providers):

- requesting on-demand transport services
- pre-booking travel tickets (e.g. for rail)

Considering that on-demand transport is targeted to a very specific group only, and that pre-booking of travel tickets is a service for the most part offered by national rail/ bus operators, the actual level of service provision is very limited. Online payment and parking space reservation are for example only offered by one in ten transport authorities.

Table 6 Status of provision of interactive services (providers only)

Service	Percent of all service-providing authorities using the following media			
	tele-phone / fax	**kiosks**	**internet**	**video-text / minitel**
requesting on-demand transport services	46	15	6	2
pre-booking travel tickets (e.g. for rail)	41	16	7	3
paying online for tickets / services	11	6	2	0
reserving a parking space	7	6	0	0

Note: The basis for percentages (=100%) are authorities providing any service.

Two interesting qualifications are necessary to complete the overall picture:

- The higher involvement of network members is again visible, but less distinct.
- Mediterranean authorities are more pro-active in supplying interactive services (especially for the two "real" transport authority services, online payments and parking space reservation).

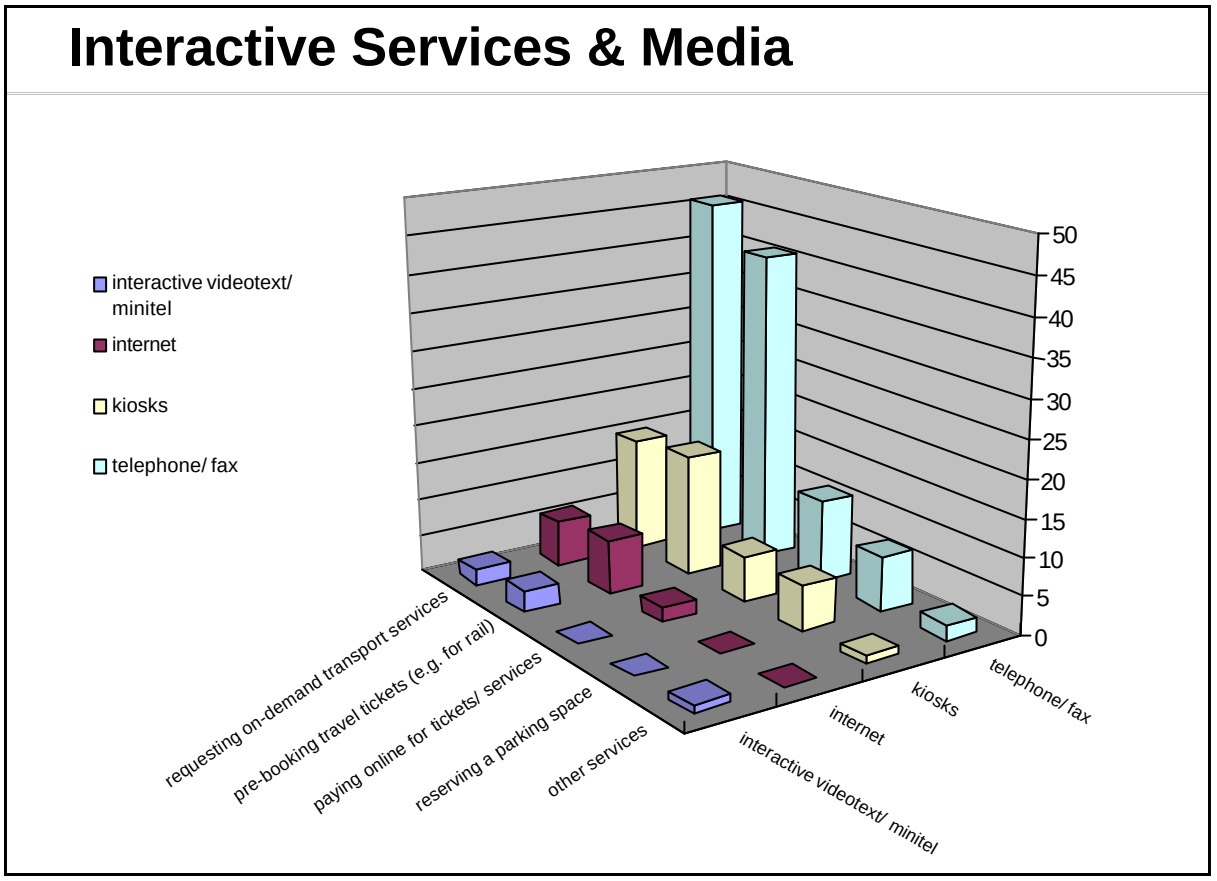


Figure 16 Media profiles of interactive services
(Note: The numerical basis of the figure is the total number of responses.)

4.3 INTERCONNECTION WITH OTHER SECTORS

The potential to create synergies between separate telematics applications is often argued to be a major benefit. This is however a complex issue involving sophisticated technical as well as institutional arrangements. Although this issue was not investigated in detail in the EDC Survey, one question was asked to provide an indication of the maturity of approach and general service quality for users.

Overall 43 of a total of 187 responding authorities claimed to have their transport telematics services interconnected with applications in other sectors. This is equivalent to 23% of all authorities in the sample. On average four sectors were indicated. The major areas of interconnection are given in figure 17.

Those areas most often chosen bear a direct relevance to transport: tourism and leisure, as well as (to a lesser degree) environment. Less covered are education and health/ social services.

There are no significant differences between any sub-groups in the sample in terms of authority size, network membership or geography.

In summary it can be argued that there is only a small group of one quarter of transport authorities whose transport services are interconnected with other sectors. They connect however to a high number of sectors and the domain of chosen sectors is well related to the needs of transport users.

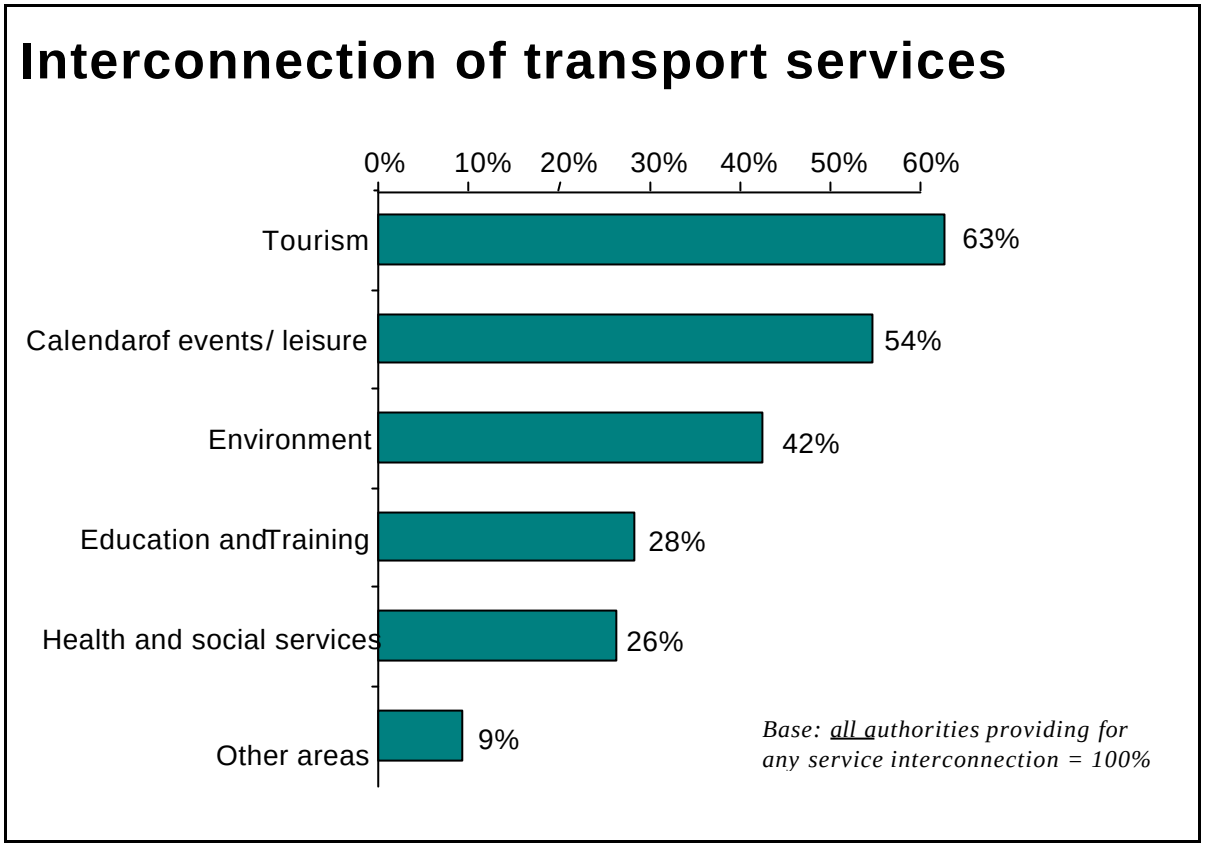


Figure 17 Level of cross-sectoral service interconnection

4.4 SUMMARY

Two out of three European transport authorities are offering a remarkable range of information services. Most common are (electronically delivered) fixed public transport schedules (44% of all authorities). Real-time information is mainly provided for car drivers (parking and general traffic conditions), but less for public transport users (25 to 32%); near real-time information is available for road works and other planned incidents by 28% of authorities. Integrated and personalised information is rare.

There are no generally preferred media for transport service delivery, but target-group and mode-specific media profiles can be distinguished:

- VMS are the obvious choice for driver information as pre-trip information provision is still low, except for road works information where internet is already the dominant medium.
- public transport information is mostly delivered via kiosks and by telephone / fax, although internet is already becoming the second preferred option (e.g. for fixed schedules).
- New services are increasingly delivered via several media.

Real interactive services are very rare, when on-demand public transport and ticket reservation (mostly for national rail) are disregarded. For example only 7% offer online parking space reservation.

Interconnection of transport services with other service areas is not very common (one quarter of authorities), but if existent, is done extensively and to areas which appear to be well linked to the travel task.

5 BENEFITS AND OBSTACLES

This section changes again focus towards the perception of decision makers. The intention is to identify some of the driving forces of transport telematics use by examining perceived benefits and - perhaps more importantly - experienced obstacles.

Respondents were asked to assign ranks to a given list of items in order of importance ("1" was indicated as most important benefit or obstacle).

5.1 EXPECTED BENEFITS FROM SUPPLYING TELEMATICS SERVICES

Mean ranks were calculated from all responses and the following picture emerges:

- Almost any rank (of any item) was given by very similar numbers of respondents. This indicates a high level of uncertainty and common understanding as to what the benefits of using telematics are.[8]
- The two key benefits clearly identified were: "generally higher quality of transport services" and "greater integration of services for users". This points to a high degree of user orientation by public sector providers of telematics services.
- Conversely, internal benefits are considered to be less important ("higher cost efficiency" and "better technical integration").
- Least important is "improved outside image of authority".

There is only a small geographic variation in perceived benefits. Southern authorities expect more strongly improved service quality. Improved technical integration is more important for them. Differences between networked and other authorities as well as between large and small cities are even lower.

[8] Therefore, there is little variation in averages in figure 18.

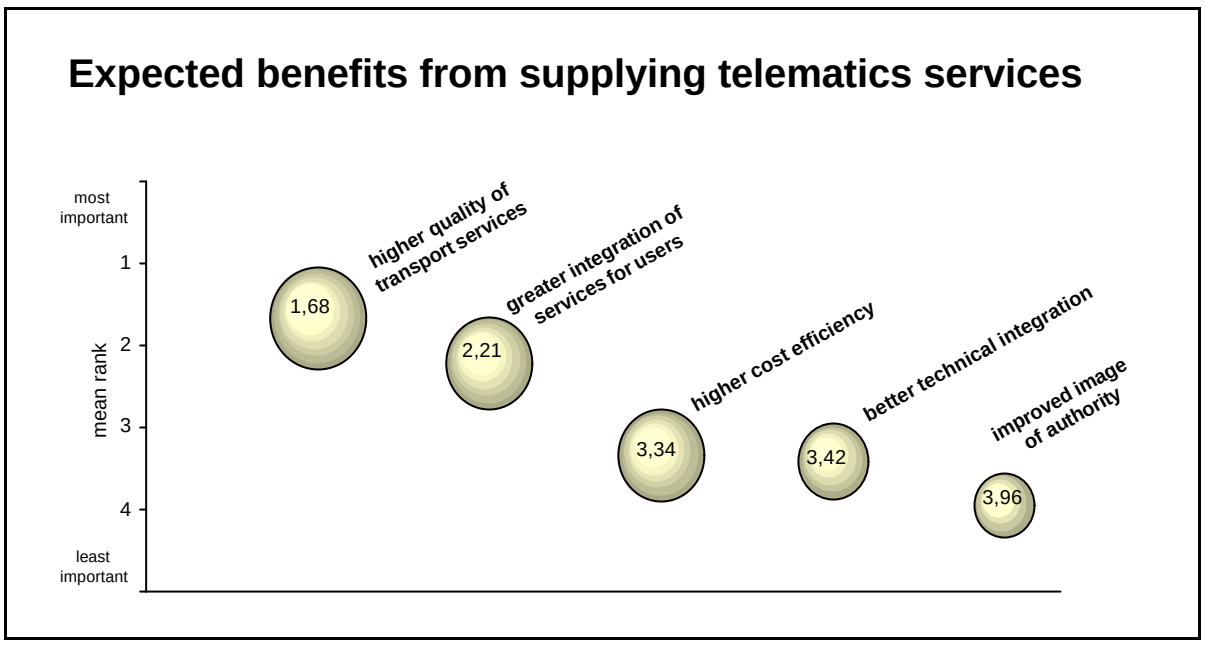


Figure 18 Expected benefits from supplying electronic services to citizens

5.2 OBSTACLES TO TELEMATICS SERVICE INTRODUCTION

There is a somewhat clearer common understanding for obstacles than for benefits. The following key obstacles emerge:

- Clearly, the "number one" concern is lack of funds.
- There is a range of issues of secondary importance ("difficulty in supplying up to date and relevant information", "users' reluctance to pay for new services", "complexity of new services"). These items can indeed be very relevant barriers to implement new transport telematics applications successfully in a market context.
- Even less important are considered "technical problems", "lack of awareness of services on the part of citizens".
- Finally "lack of political support" and "legal problems" are clearly the least problems. This indicates a very positive top-level commitment for telematics services in transport authorities and the belief that there are no legal barriers to be overcome.

In summary, the key concerns of transport decision makers relate to problems of practical market introduction - and of course the availability of financial funds.

These concerns are as well shared universally. Differences in terms of network membership, geographical balance or authority size are very small.

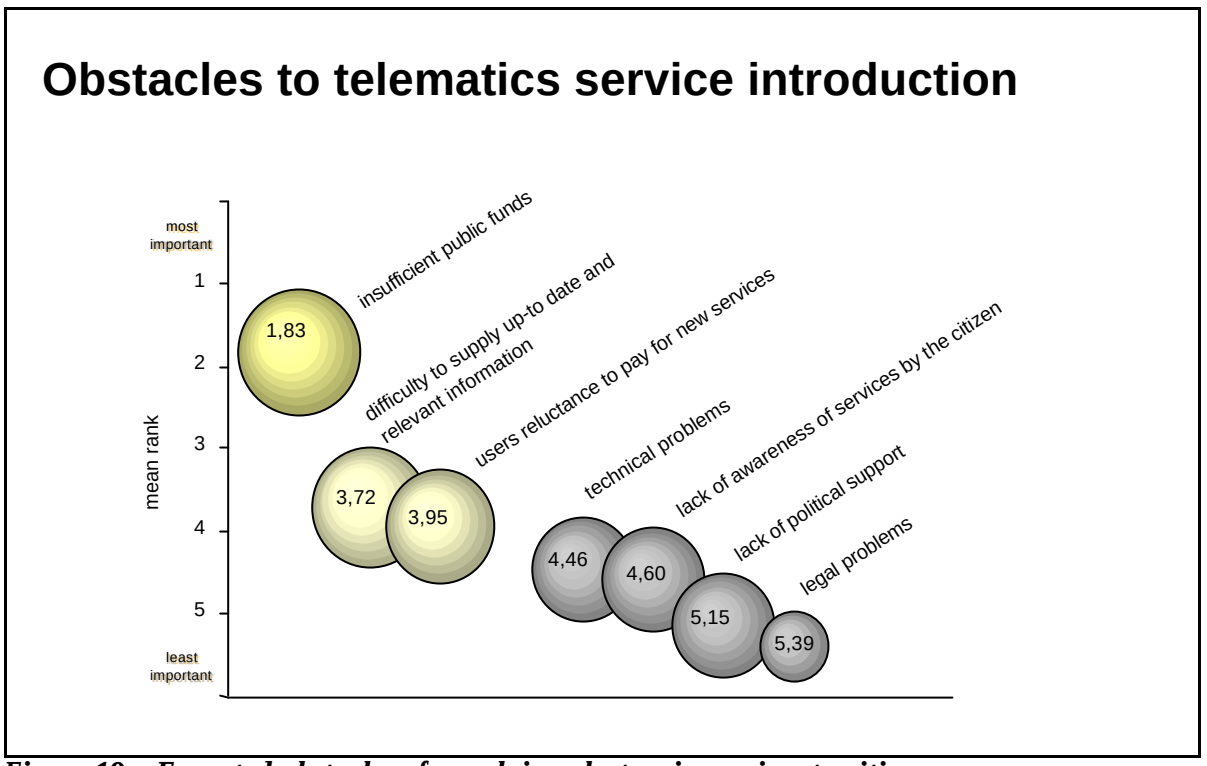


Figure 19 Expected obstacles of supplying electronic services to citizens

5.3 CONCERNS OF USING TELEMATICS

Apparently transport decision makers are not much concerned about delivering electronic services to travellers, as results to the following question show: "In delivering electronic services, are you concerned about any of the following?" Respondents were asked to indicate all items they consider as relevant from a given list.

Of a total of 187 respondents only 61, or one third indicated any concerns. Apparently transport decision makers are quite confident of supplying beneficial services.

By those who are concerned, the following items were mentioned:

Table 7 Concerns when delivering transport services

	Percent*
User friendliness of services	27
Quality of service content	22
Security of transactions	12
Personal privacy of users	8
Loss of personal interaction with citizens	8

** Base: 100% = all concerned respondents*

Again, concerns about users' positive response (user friendliness and content) are the crucial issue for transport decision makers. All other items are perceived to be of marginal importance.

5.4 SUMMARY

The key benefits of telematics service introduction for transport decision makers are related to an anticipated positive user reaction (higher general service quality and service integration for users), but less to internal or own benefits (e.g. costs, technical integration).

Main obstacles - apart from insufficient financial funds - are related to content (supplying up-to-date and relevant information) and expected low readiness to pay for new services. Technical, institutional and political problems are not regarded as key obstacles.

Transport authorities have little concerns when delivering information services. The only worries relate again to content and user friendliness, rather than transaction security or personal privacy.

6 COMMERCIAL AND INSTITUTIONAL ASPECTS

This section considers the current status of system implementation from an institutional and commercial point of view. Its objectives are to establish how far transport authorities adopt a market approach to service delivery and to identify the current level and future perspectives of partnerships for telematics system implementation on the local and European levels. The particular interest is to identify "business models" of private-public cooperation, as this is considered as a key element for the introduction of economically sustainable transport telematics applications.

6.1 MARKET APPROACH

The following questions were asked in the questionnaire in relation to this section:

- Q11. Do users have to pay for any of your electronic services (in addition to the usual price of the service)?
- Q12. Are there specific target groups for any of these services?
- Q22. How much is your organisation planning to spend this year on transport telematics infrastructure / equipment and services (excluding internal costs and training)?[9]
- Q23. Which sources of funding has your authority mainly used in implementing new technologies in the past?

Turning to the first question, related to payment, there is so far little indication of a "commercial approach" neither in the sense that users are charged for services nor that they get a rebate (because the authority might yield savings in service delivery due to lower costs). Only 2 respondents are charging,[10] 2 are granting a reduction.

The second investigated element indicating a "market approach" is the level of user (or "customer") differentiation of services.

[9] Unfortunately there were several problems associated with financial data in the EDC Survey: In addition to coding mistakes, the response rate for questions requesting financial information was low and showed national patterns. It was also discovered during analysis that apparently there was not a common understanding of budget lines to be included in the telematics spending budget, which led to several outliers. In order to avoid conclusions on the basis of unreliable data, this question was not included in the following analysis.

[10] Excluded were responses indicating the actual cost of transport etc.

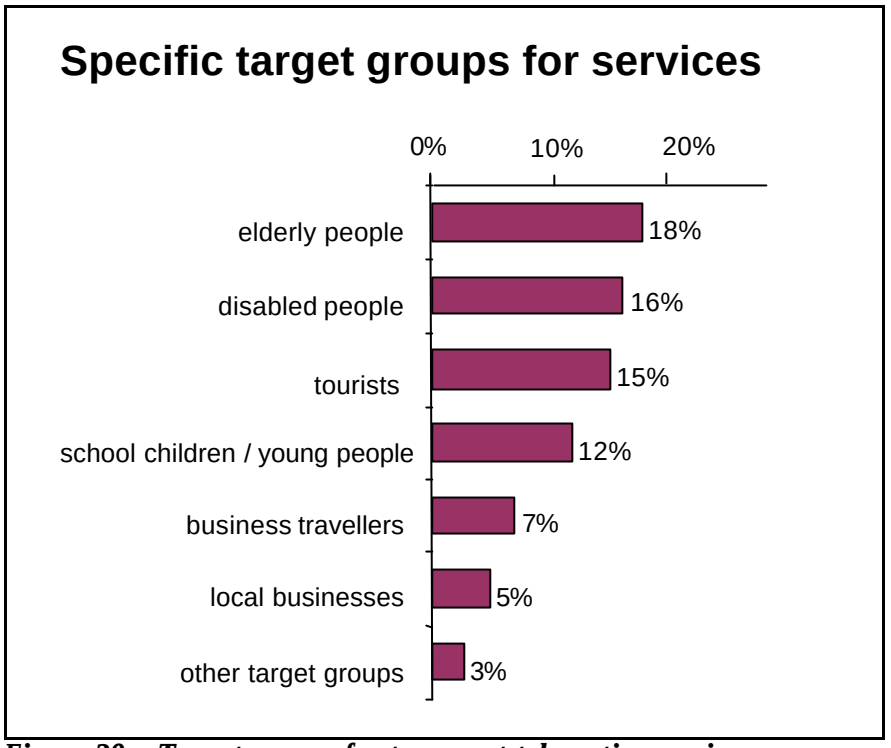


Figure 20 Target groups for transport telematics services

Transport-related information services delivered by the public sector are obviously almost entirely focussed towards "the general traveller". There are only two relevant qualification to be made:

- As transport is fulfilling a vital social need, specific social groups are addressed to some degree by a minority of authorities (elderly, disabled, children).
- Tourists have also special needs, as well as a commercially relevant role. Other potential target groups for commercial services (business travellers, local business) are covered by only very few authorities.

Finally, the question on used sources of funding for implementing new technologies is relevant to add further information on the commercial approach.

Transport is mainly a government-funded business. This is reflected also in the very high public contribution levels for transport telematics services.

The level of private sector contributions is marginal. The percentage of commercially operating services is equally negligible, since only 2% overall state that they are reinvesting operating revenues, which would be the core of any commercial activity.

There is a substantial difference in funding patterns from European sources:

- There is more structural and cohesion funding in the South, which is substituting own national or regional government funds. Use of local subsidies is identical.
- More interestingly, higher overall spending requirements by network members are to a substantial degree covered by European research funding. As they are delivering more services they are

also more dependent on mainly European funding sources while the levels of private sector contributions is similar to other authorities.[11]

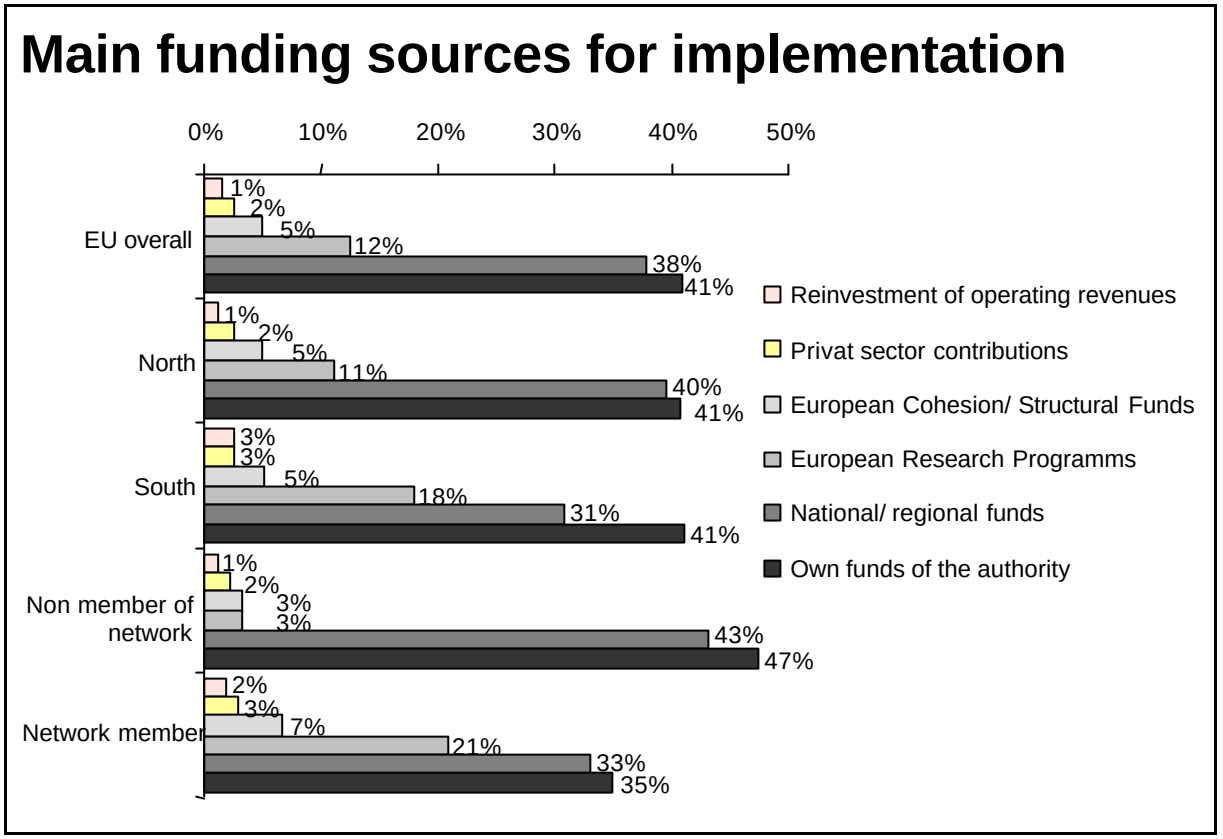


Figure 21 Funding sources for transport telematics implementations

6.2 PRIVATE-PUBLIC CO-OPERATION

The following questions were asked in the questionnaire in relation to this section:

- Q24. To what extent is the private sector participating in the provision of transport telematics services in your area?
- Q25. Who are your private sector partners?
- Q26. What are your organisation's plans for new transport telematics services? Do you envisage a more intensive cooperation with the private sector?
- Q27. Consider your authority's experience of working with the private sector in recent years! Was it in balance ...?
- Q28. In your experience, what are the main barriers preventing fuller private sector participation? Please rank the following issues in the order of importance (1 = highest)!

[11] The difference in the "reinvestment" category is (statistically) insignificant due to low absolute numbers.

6.2.1 STATUS

In further pursuing the final points of this section, it is worth considering

- the level private sector involvement in existing services
- the background of any private cooperation partners

11% percent of authorities state that "private sector contribution is often above 25%". 6 % claim even that "most of the advanced services operate mainly on a private basis." This apparently substantial level of private-public cooperation seems to be confirmed by figure 22 - at first sight.

The largest private sector group are ICT suppliers: 16% stated to cooperate with them, followed by telecommunication and cable network providers. Especially service and content providers as well as banks (for payment functions) are only partner for very few authorities.

In fact, there are three "partnership models", each represented by about one third of authorities:

- "Semi-public partners": Public transport operators and public utility providers who are in most countries controlled by the public sector.
- Private partners: Mainly technology suppliers and telecom or cable network operators.
- No partners.

Differences between North and South are interesting: Cooperation with banks is more substantial in the South, while North European authorities cooperate more with public transport operators and vehicle manufacturers.

The major observation is related to network members. They are co-operating much more with the private sector than others, mainly with ICT suppliers. But this involvement is ambivalent in so far as their interest is in selling hardware and software, rather than necessarily in setting up joint service provision partnerships.

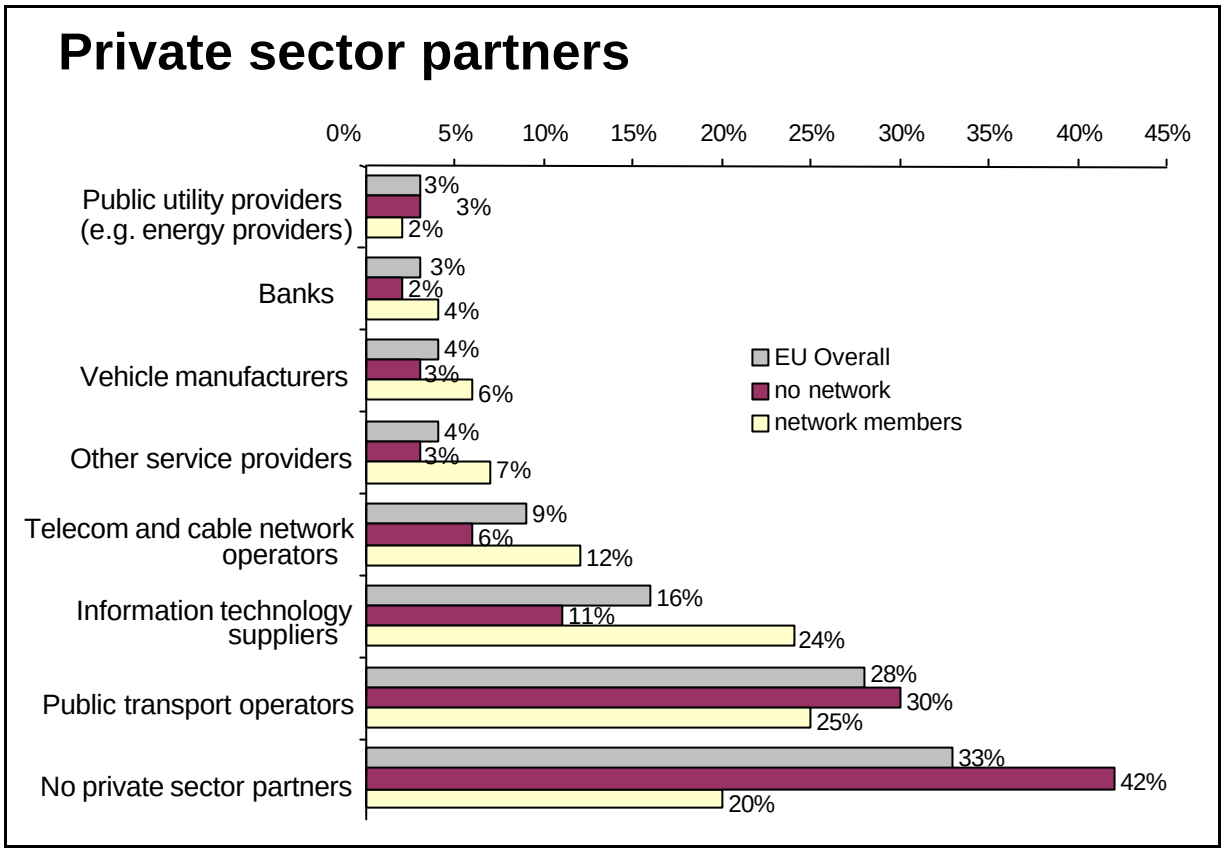


Figure 22 Level of private sector cooperation and background

Changing scope towards the perception side of cooperation, the level of satisfaction with exiting cooperation agreements is to be kept in mind.

Overall levels are extremely positive with two thirds stating that cooperation was fully or at least partly successful, although only half of Southern authorities say so. Very few respondents were not satisfied. Network members share the overall trend of positive experiences.

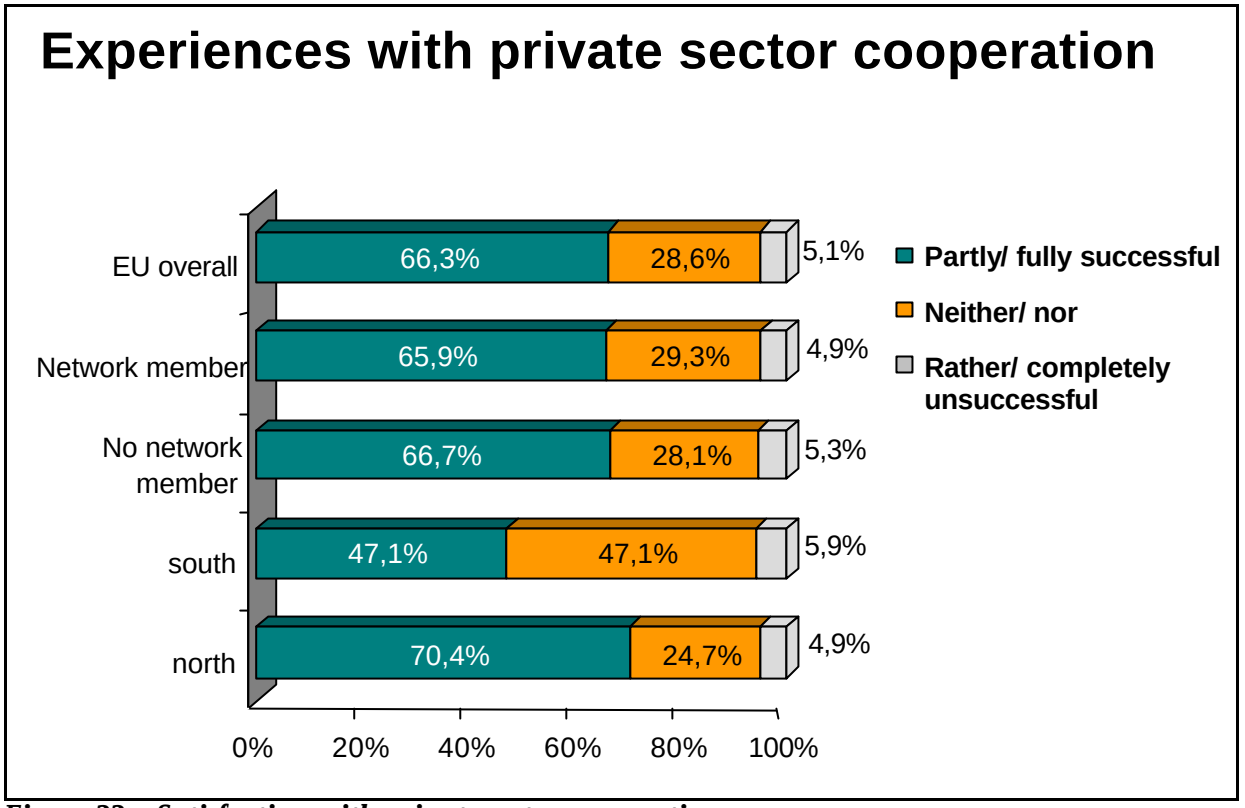


Figure 23 Satisfaction with private-sector cooperation

6.2.2 BARRIERS

What are the perceived barriers to stronger cooperation with the public sector? Table 8 provides an overview of the mean ranks assigned by decision makers.

Table 8 Barriers to private sector cooperation

Issue	Average rank
Difficulty to establish a clear business case	2,0
Public and private roles are incompatible	2,7
Legal problems of cooperation	2,9
Lack of interest from private sector	2,8
Own lack of interest	3,8

Note: Higher ranks identify lower importance

In figure 24 percentages of responses assigning rank 1 or 2 to any of these items are visualised. The key results are:

- Own lack of interest is the least problem, so there is considerable readiness to cooperate from the public side.
- The most essential problem is seen as the difficulty to establish a clear business case for services of mutual interest.
- There are two issues which indicate (if not a miss-perception of the institutional or legal reality) a lack of information on viable co-operation models. These are the statements "Public and private roles are incompatible" and "Legal problems of cooperation"
- Another substantial barrier, ranked as most or second most important by half the respondents is "Lack of interest from private sector"

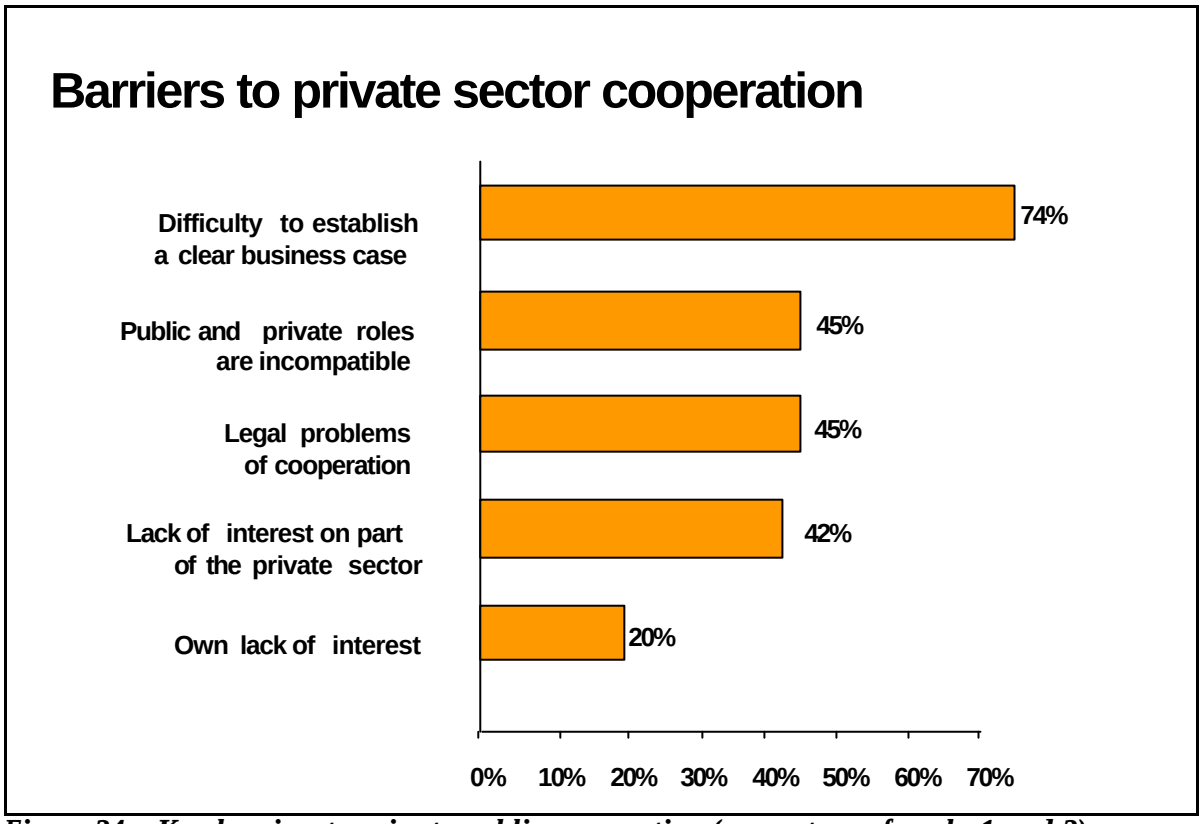


Figure 24 Key barriers to private-public cooperation (percentage of ranks 1 and 2)

In the North of Europe the perceived "incompatibility of roles" seems to be felt more strongly, while South European decisions makers are more troubled about legal problems and difficulties to establish a business case.

Network members are less concerned about lacking private sector interest, but more about the business aspects.

6.2.3 FUTURE PLANS

Considering the previous points it should be interesting to check how decision makers see the future of private-public cooperation:

- There is only a small group (of one quarter of respondents) who believe that their authorities will be able to maintain high levels of public funding.
- Two thirds believe that the private sector will play a greater role in the provision of new services in the future.

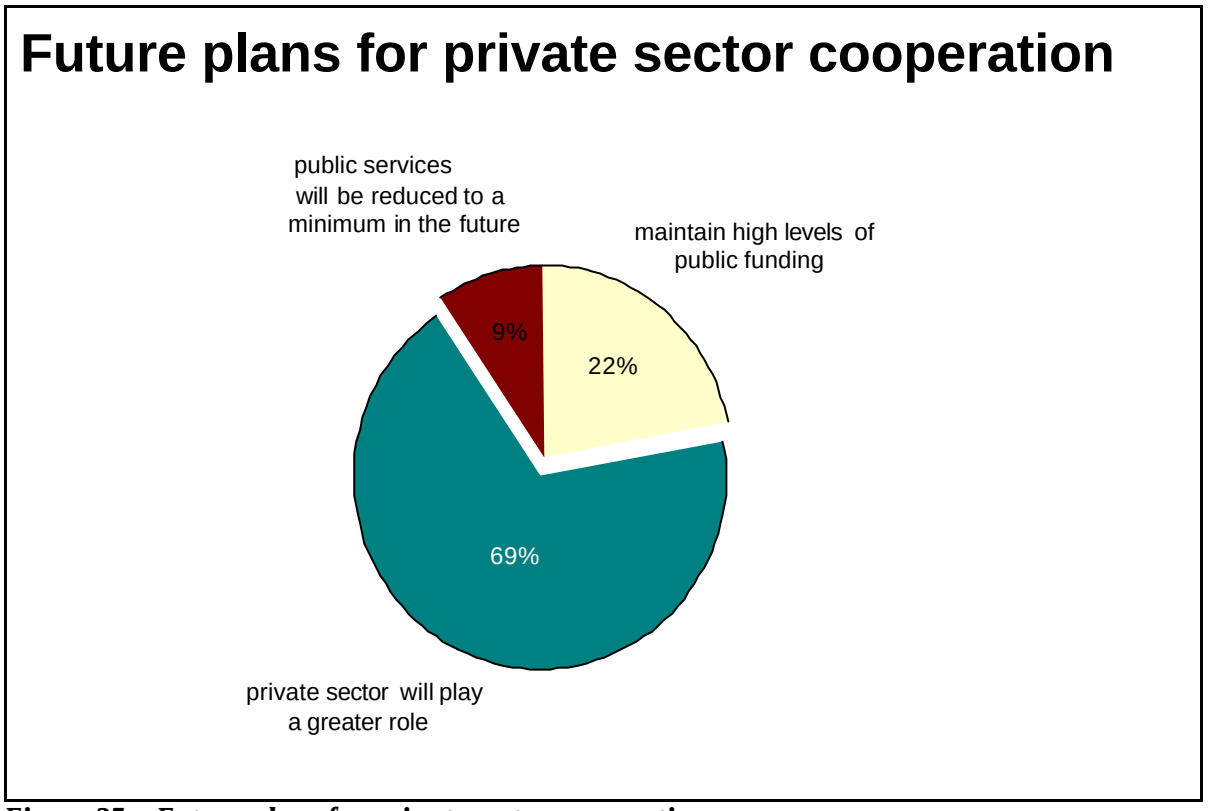


Figure 25 Future plans for private sector cooperation

6.3 EUROPEAN COOPERATION

The following questions were asked in the questionnaire in relation to this section:

- Q29. Has your authority participated in any European Research and Development Programmes in the last three years?
- Q30. What funding have you received over the last three years? ! Please estimate, if you do not know the exact figure![12]
- Q31. Overall, how would you summarise your authority's experiences of working on the European level?

About one quarter of responding authorities have participated in European Research and Development Programmes in the last three years; interestingly over two thirds of the very large cities (above 500.000) did so. Participation levels in the South are at 29%, in the North at only 18%; this is a completely reversed situation as compared to the general telematics part of the EDC Survey.

[12] As stated before, the analysis of financial information is not producing reliable results and is therefore omitted.

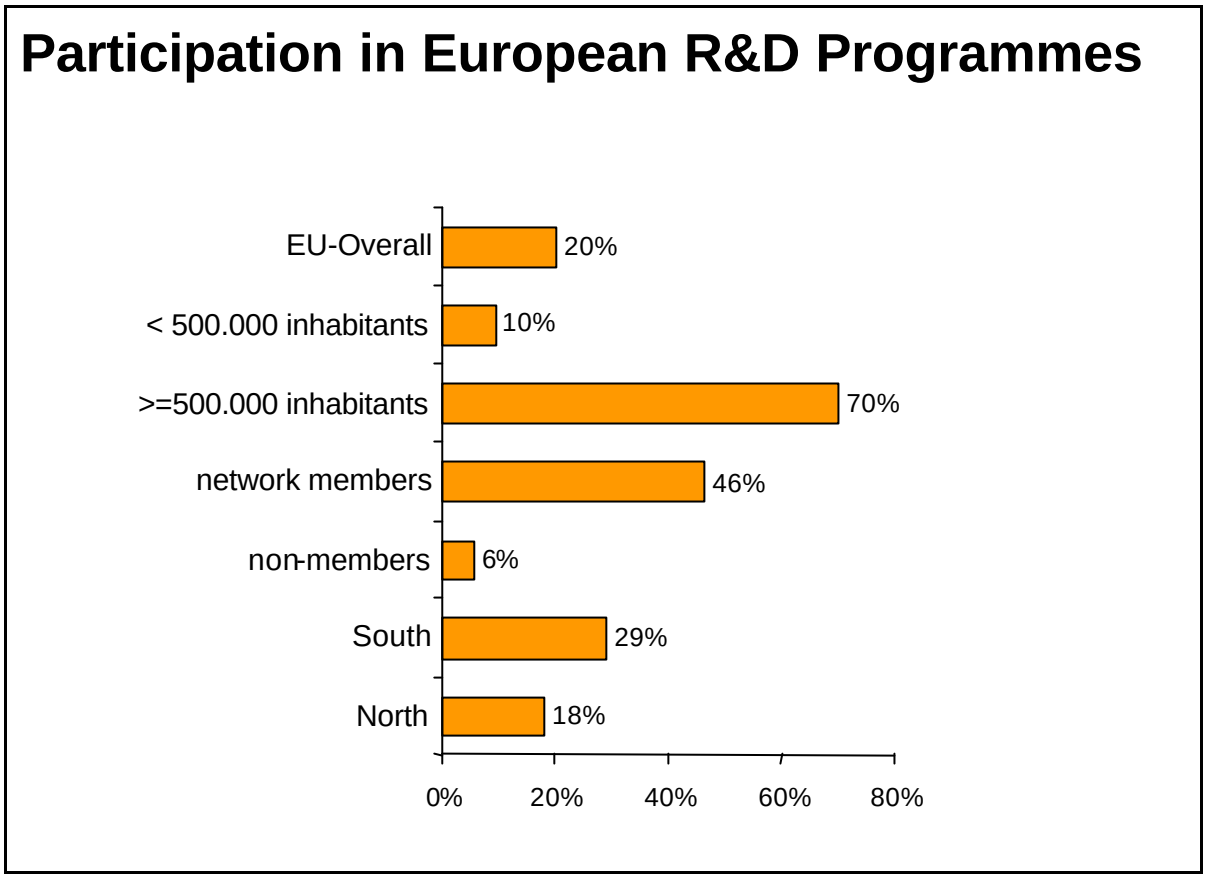


Figure 26 Participation in European R&D Programmes

The key difference however is to be explained by network membership. Almost half of network members participated in joint European RTD projects, compared to only 6% of non-networking authorities.

Table 9 Satisfaction with EU-Cooperation (Percent)

	Non-Network Members	Network Members	All Authorities
fully successful	7	37	22
partly successful	20	37	28
neither / nor	61	15	38
rather unsuccessful	7	10	9
completely unsuccessful	5	2	4
Total	**100**	**100**	**100**

Two out three urban and regional decision makers consider their authority's participation in European cooperation fully or at least partly successful, only one in ten would call it "unsuccessful". Geographic variations between North / South are minor.

Network members are considerably more satisfied with European cooperation than the average.

6.4 SUMMARY

Transport-related information and interactive services are mostly lacking a commercial approach:

- Most services are targeted to the general traveller, i.e. target-group specific services for example for business travellers or tourists are rare, except as a "social function" for disabled or elderly people.
- Services are almost exclusively free.
- There is a marginal level of private sector participation in funding services. Reinvested revenues are not at all a common funding source.
- Private-public partnerships are restricted mostly to cooperation with ICT suppliers (presumably for demonstrations and trials) or to semi-public organisations rather than service providers.

However readiness to co-operate with the private sector is strong and most transport decision makers expect a strong role for private businesses in the future.

The key perceived obstacle for stringer private-public cooperation is the difficulty to establish a clear business case for new services.

Geographic differences are not particularly relevant. However network members are more active in private-public cooperation, but this appears to be linked to demonstrations rather than full commercial services. Due to their technical pioneering role they are also more dependent on public research funding. They are not pioneers in terms of their business approach.

Cooperation on the European level is generally considered as positive. However large authorities are much more successful to become involved in European RTD programmes.

Network membership appears to be almost an essential pre-condition of European programme participation.

ANNEX 1: METHODOLOGICAL APPROACH AND REPRESENTATIVENESS

1 METHODOLOGICAL APPROACH

In summary the following steps were performed to ensure a state-of-the-art approach to the survey:

Step 1: Set up of representative databases

The aim of the research was to achieve results which are representative for urban and regional authorities on the European level and which can be generalised to draw reliable conclusions in the main areas of interest of the survey. In order to achieve also a high return rate it was considered important to send questionnaires directly to decision makers, which required personalised mailings in several languages.

Since there was no suitable mailing database available, this had to be produced prior to the field work. The basic selection principles for ensuring representativeness of authorities were as follows:

- all 15 EU Countries were to be included
- the budget allowed for a mailing of not more than 1000 questionnaires in each (i.e. the cross-sector and transport parts) of the EDC survey
- due to their importance (as potential "pacemakers" and the substantial size of population affected by their policies) all authorities of 100.000 or more inhabitants were included
- from the remaining authorities below a population of 100.000 a random selection was drawn
- the minimum size of authorities considered in the random selection was set at a population of 20.000. For Finland and Ireland, which are characterised by a particularly low average size of authorities, the minimum was set at 5.000 inhabitants

The number of selected authorities for each country was specified in order to match the following criteria:

- the overall number of authorities per country should be roughly equivalent both to the share of that country's share of population among all 15 EU member states and its share of authorities among all European authorities
- the relative weight of large (100.000 or more inhabitants) and small authorities should roughly reflect their proportion within each country

In order to reconcile these conflicting demands averages were used to calculate the final number of target authorities per size/country segment. This was achieved without creating any substantial imbalances. Therefore, it can be claimed that a database of local and regional authorities was used as the basis of the mailing which is essentially representative in terms of

- overall geographic balance on the European level (i.e. population weights between countries)
- size distributions between large and small authorities within countries (i.e. share of authorities over/ under 100.000 inhabitants)

Since the focus in the EDC survey was on local authorities, only that layer of local decision making was to be included in the sample which would effectively make the relevant implementation decisions.

Since responsibilities in European members states differ widely an analysis was carried out to establish the appropriate layer of government for each country. Details of authorities and exact mailing numbers are as follows:

Table 10 Database and mailing details

	Database			Share of Country (EU level)				Mailing					
	Total number of authorities			Authorities		Population	Average (population & authorities)	Overall share	Tranport questionnaire		Cross-sector questionnaire	
COUNTRY	<=100.000	100.000+	All authorities	% of all authorities	% of auth. 100.000+	% of population			Number of question.	% of all authorities in country	Number of question.	% of all authorities in country
Austria	20	15	35	0,8%	1,1%	2,2%	1,3%	1,3%	12	34%	12	34%
Belgium	124	22	146	3,3%	1,6%	2,7%	2,5%	2,5%	22	15%	23	16%
Denmark	54	18	72	1,6%	1,3%	1,4%	1,4%	1,1%	10	14%	10	14%
Finland	224	23	247	5,6%	1,6%	1,4%	2,9%	1,4%	13	5%	13	5%
France	393	174	567	12,8%	12,5%	15,7%	13,6%	10,3%	95	17%	92	16%
Germany	673	405	1.078	24,4%	29,0%	22,0%	25,1%	31,0%	280	26%	283	26%
Greece	78	8	86	1,9%	0,6%	2,8%	1,8%	1,4%	13	15%	13	15%
Ireland	57	15	72	1,6%	1,1%	0,9%	1,2%	1,2%	10	14%	11	15%
Italy	382	206	588	13,3%	14,8%	15,4%	14,5%	12,5%	114	19%	113	19%
Luxemburg	9	-	9	0,2%	0,0%	0,0%	0,1%	0,2%	1	11%	2	22%
Netherlands	185	31	216	4,9%	2,2%	4,2%	3,8%	3,2%	30	14%	29	13%
Portugal	199	28	227	5,1%	2,0%	2,6%	3,3%	4,2%	39	17%	38	17%
Spain	268	123	391	8,8%	8,8%	10,7%	9,4%	8,8%	80	20%	79	20%
Sweden	110	35	145	3,3%	2,5%	2,4%	2,7%	2,1%	19	13%	20	14%
United Kingdo	252	292	544	12,3%	20,9%	15,7%	16,3%	18,7%	170	31%	170	31%
Total	3.028	1.395	4.423	100,0%	100,0%	100,0%	100,0%	100,0%	908	21%	908	21%

Working from the assumption that membership in a large European network of local or regional authorities might have a particular significance in local policy making, it was considered useful to include also all relevant authority contacts of the network supporting the EDC survey (Car Free Cities, Eurocities, POLIS and Telecities) as a special subset in the mailing database.

For the transport part, all authority contacts of POLIS and Car Free Cities and relevant contacts of Eurocities were included (Telecities contacts were included in the cross-sector part of the survey). A match was performed between the random selection database and the network database to avoid double sending of questionnaires to one authority (giving preference to network contacts).

Step 2: Questionnaire design

The survey was designed to enable an in-depth analysis of local authority decision makers perceptions and the state of the art and future plans of telematics deployment in their cities or regions. Therefore a questionnaire of several pages (cf. Annex 2) with in-depth questions was designed and agreed with EDC and the European Commission.

The main section covered in the questionnaire were:

- background information (general data, overall role of telematics, information on respondent)
- key policy areas (key problems, perceived impact)
- status of technologies used and services provided (key section covering a wide range of internal and external implementation issues)
- financing of services and private-public cooperation
- cooperation on European level

Step 3: Questionnaire mailing

The questionnaire was made available in five languages (English, French, German, Spanish and Italian) and its quality was checked by local authority personnel in the respective countries.[13]

A total of 908 questionnaires was finally sent out in a personalised mailing to

- decision makers in charge of transport matters in cities or regional authorities of 100.000 or more inhabitants
- chief executives of authorities below 100.000 (due to their responsibilities mayors were co n-tacted in Italy, Spain, Portugal and Greece)
- appropriate contacts from supporting networks (Car Free Cities, Eurocities, POLIS)

A cover letter was attached and co-signed by the Presidents of Car Free Cities, Eurocities, POLIS and Telecities.

In addition, an online version for interactive response and electronic copies of the questionnaire for download were made available at the EDC WWW site. This fact was publicised to EDC and TAP project participants by email.

Step 4: Return control and reminders

During the return phase two reminders were send to non-responding authorities in order to ensure the highest possible amount or returns (i.e. every authority was contacted up to three times). The target number of 20% return was thereby achieved.

Step 5: Data entry and analysis

Upon receipt responses to open questions were translated into English. All returned data was entered by using the SPSS Data Entry software.

The analysis was performed with the professional software product Statistics Package for the Social Sciences (SPSS).

2 SURVEY RESPONSE

RESPONSE OVERALL

Return rates were very different between countries and authority size segments. This response pattern is not obviously related to the fact whether a national language questionnaire was available. For example France and Spain showed low return rates to national language versions, whereas Denmark had very high and Sweden average rates, although there were no questionnaires available in these languages. There is also no clear North-South pattern, and different results emerge between the transport and cross-sector surveys.

A total of 187 questionnaires were returned for the transport part of the EDC Survey 1998. This is equivalent to a response rate of 20%, a rate which is above average for comparable exercises among this target group.

[13] Initially, versions in all official European languages had been prepared, but were not used in subsequent mailings due to problems of quality control and eventual complexity of mailing logistics.

This rate is equivalent to around 4% of all European urban and regional transport authorities, or ca. 6% of cities above 100.000 inhabitants. It could be confirmed during analysis that the resulting database produces stable results and is therefore currently one of the best sources of information on telematics deployment issues among local and regional authorities in European member states.[14]

REPRESENTATIVENESS

Full information on representativeness of the 1998 EDC Survey is given in table 11. The main conclusions are as follows:

On the level of authority size

- 4% of all authorities below 100.000 are included, whereas there is a 6% representation of authorities of 100.000 or more population
- the number of large and small authorities is almost equal (93 small and 86 large)
- within countries differences between large and small cities appear to be sometimes uneven according to the database used, but there is also too little detailed knowledge about real distributions in size

In summary the survey results overemphasise larger authorities. This is however not considered as a drawback, because their policies are affecting an (intentionally) proportionately larger share of the population and they must also be considered as "pacemakers" on the national levels. At the same time there is a sufficient number of small authorities to balance overall results.

On the level of distribution between member states

- total numbers of authorities are for most countries insufficient to justify analysis on the national level
- Austria and the United Kingdom are over-represented
- France, Italy and Portugal are under-represented
- Finland is also under-represented, however this is most likely due to the inclusion of a too large number of small authorities[15]

In conclusion, only the mis-representation of UK, French and Italian authorities is influencing the sample negatively, since there are too little differences in returns vs. target numbers in absolute terms for Austria and Netherlands to have any serious effect. Overall however, the EDC 1998 Survey can be considered as an adequate representation of urban and regional transport authorities on the European scale.

There was no attempt made to apply any weighting factors to responses. This would have required substantial background research on the real distribution of local authority size for each European country beyond any readily available contact database. There is, in addition, also substantial concern on producing "artificial" results through extensive "weighting".

[14] See figure 1 (Number of Received Transport Survey Questionnaires by Country) above.

[15] The lower limit for inclusion of Finnish authorities was a population of 5.000 (rather than 20.000 in other countries).

Table 11 Return rates and representativeness by country

	Transport Sector						
	Return Rate	Representation			Comments		
COUNTRY	All authorities	<=100.000	100.000+	All authorities	Response	Representativeness	
						within country	overall (EU)
Austria	33%	15%	7%	11%	high	very high for small authorities	over represented
Belgium	18%	1%	9%	3%	±	±	±
Denmark	30%	4%	6%	4%	high	±	±
Finland	23%	1%	0%	1%	±	low for large authorities	under represented
France	7%	1%	2%	1%	low	low for large authorities	under represented
Germany	22%	3%	9%	6%	±	±	slightly over represented
Greece	31%	4%	13%	5%	high	±	±
Ireland	30%	2%	7%	4%	high	±	±
Italy	11%	1%	2%	2%	low	low for large authorities	under represented
Luxembourg	0%	0%	0%	0%	only 1 questionnaire was sent which was not returned		
Netherlands	30%	2%	16%	4%	high	high for large authorities	±
Portugal	10%	1%	7%	2%	low	±	under represented
Spain	19%	2%	7%	4%	±	±	±
Sweden	21%	3%	3%	3%	±	low for large authorities	±
United Kingdom	31%	2%	14%	10%	high	high for large authorities	over represented
Total	**20%**	**2%**	**8%**	**4%**	**compara-tively high return rate**	**no serious imbalances in general**	**acceptable**

In order to ensure the highest level of validity of general conclusions in the 1998 EDC Survey, the following conclusions were drawn for analysis:

- geographic differentiation will be restricted to categories "North" (Germany, Belgium, Netherlands and Scandinavian countries) and "South" (Mediterranean countries, including France)
- differentiations in terms of authority size will be made
- networked and non-networked cities will be analysed separately

During data analysis separate analyses were made for these three basic categories for all items in the questionnaire and are reported in this report whenever there are any apparent significant, non-trivial features emerging along these lines.

This approach fully balances any shortcomings in full representativeness on geographical or authority size level as well as any bias resulting from the specific role of networked cities in the EDC Survey, since differing results for these basic sub-groups are always reported differently.

ANNEX 2: QUESTIONNAIRE

1998 SURVEY ON THE USE OF TRANSPORT TELEMATICS IN EUROPEAN CITIES AND REGIONS: 1000 decision makers state their priorities!

Please respond by ...date ... and return the completed questionnaire to the following address: EDC Survey 1998, ... address ... , or fax to: ... fax number .

Background information on your city/region and administration.

1. To compare and analyse your responses we need some background information.

Name of authority:[16] ..... Country: .....

Population: ..... How many cars per 100 inhabitants: ca. ..... cars.

What is the current modal split? (as % of all journeys)
..... % motorised (private) traffic
..... % public transport (all types)
..... % cycling and walking

Institutional role of your organisation? ☒ *Tick the most appropriate box, please!*

☐ an independent city (not subject to a larger regional authority)
☐ a regional authority (containing several dependent municipalities)
☐ a municipality (administratively subject to of a larger regional authority)

☐ Other role ..... (✎ *Please specify*)

2. Please provide some information on your administration! ✎ *Estimate the following figures, please:*

Number of employees (white collar only) .....

What is your organisation's total projected expenditure this year? ..... currency: .....

3. In which European networks is your authority actively involved? ☒ *Tick all appropriate boxes, please!*

☐ Car Free Cities ☐ Eurocities ☐ POLIS ☐ Telecities

☐ Other networks ..... (✎ *Please specify*)

4. What is your authority's position on using and promoting transport telematics?[17]
☒ *Tick a single box which best describes your position!*

☐ Not an area of major activity at the moment.
☐ Important, but currently not crucial to us.
☐ An essential component of our transport strategy.

5. What is your role and primary responsibility in your organisation? ☒ *Tick only the most appropriate box, please!*

☐ I am a member of the **administration** in the department responsible for ...
☐ Traffic control ☐ Economic development/ urban regeneration
☐ Transport Planning ☐ Building/ architecture
☐ Town/ Country Planning ☐ European affairs
☐ Other department ..... (✎ *Please specify*)

☐ I am a member of **staff** directly responsible to the mayor, chief executive etc.
☐ I am an elected representative (e.g. mayor, councillor, chief executive)

☐ I have **another** role ..... (✎ *Please specify*)

[16] *If you prefer you can answer anonymously.*

[17] *Transport telematics is also referred to as „intelligent transport systems".*

What are the key transport problems of your city or region? How can telematics help?

6. What do <u>you</u> feel are currently the three largest transport problems in <u>your own</u> city or region (in order of priority)?
✎ *Please give a few keywords!*

Our most important problem is: .....

Our 2nd most pressing problem is: .....

Our 3rd most pressing problem is: .....

7. What <u>do you personally</u> believe the impact of telematics might be in the next 2 - 3 years? ☒ *Tick <u>one</u> box for each area!*

... in these areas:	**low** (i.e. no or very little actual change)	**moderate** (i.e. some benefits are expected)	**significant** (i.e. major improvements will be achieved)
enhanced traffic **safety**	☐	☐	☐
efficient management of **transport demand**	☐	☐	☐
accessibility of activity centres	☐	☐	☐
mobility of **disabled & elderly people**	☐	☐	☐
energy efficiency in transport	☐	☐	☐
reduction in **air and noise** pollution	☐	☐	☐
efficiency of **freight deliveries**	☐	☐	☐
access to mobility **information and services**	☐	☐	☐
increased **cost-benefit ratio** in transport services	☐	☐	☐
efficient **use of transport infrastructure**	☐	☐	☐
quality of public transport services	☐	☐	☐
reliability of public transport services	☐	☐	☐
levels of **public transport use**	☐	☐	☐
facilitating the **shift to environmentally friendly modes**	☐	☐	☐
controlling/ restricting access to sensitive areas	☐	☐	☐
revenues from charging for road use	☐	☐	☐

Overview of systems used and services provided.

8. Which transport telematics systems are currently in use in your city/ area, which are you planning for the next 2-3 years? ☒ *Tick <u>one</u> box for each area! <u>Note:</u> For integrated systems tick all individual components separately! Please include also systems not directly under your organisation's responsibility!*

The following transport telematics systems are ...	**fully available** (we have <u>no</u> extension plans)	partly installed, **extension planned**	**not installed,** but planned	currently **no plans** for implementation
coordinated **traffic signal control**	☐	☐	☐	☐
incident and **emergency management**	☐	☐	☐	☐
integrated **traffic control** with **public transport priority**	☐	☐	☐	☐
telematics-aided parking management (info & pricing)	☐	☐	☐	☐
traffic control or information centre	☐	☐	☐	☐
pre-trip information (e.g. videotext, Internet)	☐	☐	☐	☐
collective driver information and route guidance	☐	☐	☐	☐
in-vehicle, dynamic information for drivers (e.g. RDS/ TMC)	☐	☐	☐	☐
portable traveller information devices ("digital assistants")	☐	☐	☐	☐
real-time **public transport information** (e.g. at stops)	☐	☐	☐	☐
public transport priority at intersections	☐	☐	☐	☐
public transport **vehicle scheduling & control**	☐	☐	☐	☐
demand-responsive public transport	☐	☐	☐	☐
pollution monitoring and information	☐	☐	☐	☐
telematics-aided **access control** (e.g. in sensitive areas)	☐	☐	☐	☐
telematics-aided **traffic calming** (e.g. speed control)	☐	☐	☐	☐
freight delivery logistics (with telematics support)	☐	☐	☐	☐
electronic **fee collection** for road use	☐	☐	☐	☐
coordinated **urban – regional** traffic control	☐	☐	☐	☐
Other systems _____	☐	☐	☐	☐

9. Considering these systems, are any of the following advanced technologies used, or are there plans to do so in the next 2-3 years? ☒ *Tick one box for each area, please!*

	Yes, is **fully** used.	**Yes**, but on a **trial** basis only.	**No**, but we are **planning** to.	**No**, we have no plans.
Radio Data System/ Traffic Message Channel (RDS/TMC)	☐	☐	☐	☐
Variable Message Signs (VMS)	☐	☐	☐	☐
Dedicated short-range communication (DSRC)	☐	☐	☐	☐
Digital Audio Broadcasting (DAB)	☐	☐	☐	☐
satellite-based positioning (GPS)	☐	☐	☐	☐
smart cards (e.g. for ticketing)	☐	☐	☐	☐
handheld terminals (e.g. Personal Traveller Assistants)	☐	☐	☐	☐
Short Message Service (SMS; part of GSM service)	☐	☐	☐	☐
Other (✎) _____	☐	☐	☐	☐

10. What transport-related information and services does your authority provide for travellers and drivers? Which technical platform are you using to deliver them? ☒ *Tick all relevant boxes for each item, please!*
Note: Include also joint services with other organisations (e.g. in-car information with private sector.)

Our citizens can get the following information via:	**video-text or minitel**	**Internet**	**public access kiosks/ terminals**	**automatic telephone/ fax services**	**variable message signs**	**on-board equipment**
real-time information on **traffic conditions**	☐	☐	☐	☐	☐	☐
dynamic **travel times** for road users	☐	☐	☐	☐	☐	☐
location of **parking** spaces (incl. Park&Ride)	☐	☐	☐	☐	☐	☐
availability of **parking** spaces	☐	☐	☐	☐	☐	☐
current **road works** & other **incidents**	☐	☐	☐	☐	☐	☐
weather information/ forecasts	☐	☐	☐	☐	☐	☐
fixed schedules of buses/ trams/ metro	☐	☐	☐	☐	☐	☐
real-time **public transport information**	☐	☐	☐	☐	☐	☐
advance notice of **public transport disruptions**	☐	☐	☐	☐	☐	☐
personal itineraries for **multi-modal journeys**	☐	☐	☐	☐	☐	☐
real-time **environmental information**	☐	☐	☐	☐	☐	☐
other (✎) _____	☐	☐	☐	☐	☐	☐
other (✎) _____	☐	☐	☐	☐	☐	☐

Our citizens have access to the following interactive services via:	**(interactive) videotext**	**Internet**	**public access kiosks/ terminals**	**telephone call centre**
requesting **on-demand transport services**	☐	☐	☐	☐
pre-booking travel tickets (e.g. for rail)	☐	☐	☐	☐
reserving a **parking space**	☐	☐	☐	☐
paying online for tickets/ services	☐	☐	☐	☐
other (✎) _____	☐	☐	☐	☐
other (✎) _____	☐	☐	☐	☐

11. Do users have to pay for any of your electronic services (in addition to the usual price of the service)?

☐ Yes, for ..... (✎ *Put name of the services or mark with an **X** above*).
☐ No, all services are free of charge.
☐ No, there is a discount for using electronic services.

12. Are there specific target groups for any of these services? ☒ *Tick all appropriate boxes!*

☐ General public
☐ Elderly people
☐ Disabled people
☐ School children/ young people
☐ Tourists (not residents in our area)
☐ Business travellers
☐ Local businesses
☐ Other groups .....(✎ Please specify)

13. In delivering these electronic services, are you concerned about any of the following? ☒ *Tick all relevant boxes, please!*

☐ Personal privacy of users.
☐ Security of transactions.
☐ Quality of service content.
☐ User friendliness of services.
☐ Loss of personal interaction with citizens.

☐ **No**, we have no such concerns.

14. Are any of your transport telematics services interconnected with any other services in the following areas?
☒ *Tick all appropriate boxes!*

☐ Tourism
☐ Environment
☐ Calendar of events/ leisure
☐ Education and Training
☐ Health and social services
☐ Other areas .....(✎ Please specify)

Benefits and Obstacles of Using Transport Telematics.

15. What benefits do you expect from supplying transport telematics services to citizens?
✎ *Please rank the following issues in the order of importance (1 = highest)!*

Rank

..... better **technical integration** between systems
..... higher **cost efficiency**
..... greater **integration of services for users**
..... generally higher **quality** of transport services
..... improved external **image** of authority
..... others ..... (✎ *Please specify*)

16. And what obstacles do you face in extending transport telematics services ?
✎ *Please rank the following issues in the order of importance (1 = highest)!*

Rank

..... insufficient **public funds**
..... **legal problems**
..... difficulty in supplying up to date and relevant **information**
..... lack of **awareness** of services on the part of citizens
..... **technical problems**
..... **complexity** of new services
..... users' reluctance to **pay** for new services
..... lack of **political** support
..... others ..... (✎ *Please specify*)

Transport and sustainable development.

17. Generally, what priority is your administration giving to environmentally-friendly (or „sustainable") development in the area of transport? ☒ *Tick one box only, please!*

☐ It has first priority in our policies. ☐ It has intermediate importance. ☐ It has little practical relevance.

18. Has your authority set up a plan for „Local Agenda 21"?
(NOTE: „Local Agenda 21" is an initiative to set up local action plans for environmentally friendly and resource saving policies)

☐ Yes. One is in operation.
☐ No. But we plan to set it up over the next 1-2 years.
☐ No. We currently have no plans for one.

19. Are you taking any action to increase public awareness of environmentally friendly transport? ☒ *Tick one box, please!*

☐ Yes. We had an awareness campaign/ One is currently going on.
☐ No. But we plan to do so during the next 1-2 years.
☐ No. We currently have no plans for it.

20. Regarding the demand for travel, what impacts are you expecting from the introduction of transport telematics systems in your area? ☒ *Tick one box only, please!*

☐ **Reduction** in road travel demand.
☐ **Increase** in road travel demand
☐ **No change** or more complicated effects.

21. Is your authority considering implementing a road or area pricing scheme? ☒ *Tick one box only, please!*

☐ Yes, we have already **completed a trial**.
☐ Yes, we are **considering** the possibility.
☐ No, earlier plans had to be **cancelled**.
☐ No, we are **not interested** in using road or area pricing.

Financing of services.

22. How much is your organisation planning to spend this year on transport telematics infrastructure, equipment, and services *(excluding internal costs and training)**?***

✎ *Please give an approximate figure! ..... currency: .....*

23. Which main sources of funding has your authority used for implementing transport telematics in the past?
☒ *Tick all relevant boxes, please!*

- ☐ National/ regional funds
- ☐ Authority's own funds
- ☐ European Research Programmes
- ☐ European Cohesion/ Structural Funds
- ☐ Reinvestment of operating revenues
- ☐ Private sector contributions

Cooperation with the private sector.

24. To what extent is the private sector participating in the provision of transport telematics services in your area?
☒ *Tick one box only, please!*

- ☐ Our services are almost completely funded by **public money**.
- ☐ The **private sector** contribution is often **above ca. 25%**
- ☐ Most of the **advanced** services operate **mainly on a private sector** basis.

25. Who are your private sector partners? ☒ *Tick all relevant boxes, please!*

- ☐ Information technology **suppliers** (hardware/ software).
- ☐ Telecom and cable network **operators** (private or public).
- ☐ **Public transport** operators.
- ☐ **Vehicle manufacturers**.
- ☐ **Public utility providers** (e.g. energy providers).
- ☐ **Banks**.
- ☐ Other s**ervice or content providers**.

26. What are your organisation's plans for new transport telematics services? Do you envisage a more intensive cooperation with the private sector? ☒ *Tick one box only, please!*

- ☐ No, our strategy is to maintain **high levels of public funding**.
- ☐ Yes, in **some areas** the private sector will play a greater role in the future.
- ☐ Yes, public services will be reduced to a **minimum** in the future.

27. Consider your authority's experience of working with the private sector in recent years! Was it in balance ...?
☒ *Tick one box, please!*

---------☐---------☐---------☐---------☐---------☐---------

fully successful | partly successful | neither/ nor | rather unsuccessful | completely unsuccessful

28. In your experience, what are the main barriers preventing fuller private sector participation?
✎ *Please rank the following issues in the order of importance (1 = highest)!*

Rank

..... **Legal** problems with cooperation.
..... Difficulty in establishing a clear **business case**.
..... Public and private **roles are incompatible**.
..... **Own** lack of interest.
..... Lack of interest from **private sector**.
..... Other reasons: ..... (✎ *Please specify*)

European Cooperation.

29. Has your authority participated in any European Transport Telematics Programmes in the last three years?

- ☐ Yes
- ☐ No

30. What funding have you received over the last three years? ✎ *Please estimate if you do not know the exact figure!*

European funding was: ..... currency: .....

31. Overall, how would you summarise your authority's experiences of working on the European level? ☒ *Tick one box!*

---------☐---------☐---------☐---------☐---------☐---------

fully successful | partly successful | neither/ nor | rather unsuccessful | completely unsuccessful

Thank you for participating in this survey!

If you would like to receive a copy of the results, please give us contact details of the person to whom these should be sent:

Name: .....

Organisation: .....

Postal address: .....

.....

Email: .....

Do you have any additional comments on the use of transport telematics?

Please, write them below (if necessary, add a new page)!