

ATLANTIC / e-Europe 2002

TTI Service Implementation Status Analysis in Europe

Deliverable D5.0

Vol.I – Approach and Key Findings

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This document (Vol.I, II & III) is based on the contributions from a large number of stakeholders. In particular the project partners would like to thank the authors of 25 national reports on the status of TTI service implementation, as well as all government officials in the respective countries that provided critical comments and a validation of the results. Their dedication of time and efforts has been decisive for the elaboration of this comprehensive status analysis of TTI implementation in Europe.

ATLANTIC WP5 & WP6: Deliverables overview and relation

The deliverables in ATLANTIC workpackage 5 and 6 provide a structured overview of achievements, findings and conclusions. They equally reflect the methodological approach and the strategy for a targeted dissemination of results and recommendations. With respect to the extent of the information gathered, analysed and documented, the following overview should facilitate orientation and reference for the reader (Table 0.1).

**Focused
documentation of
results**

Table 0.1: Overview and relation of WP5 & WP6 deliverables

Italics = high-quality printed edition

Rationale	No.	Title	Target Group(s)
Empirical Analysis	D5.0	TTI Implementation Status Analysis in Europe Vol.I: Approach and key findings Vol.II: National reports Vol.III: TTI service descriptions	All stakeholders of TTI service implementation in Europe
	D5.1	TTI service delivery in Europe - Good practice case studies and key actor interviews	European Commission
Stakeholder discussion	D6.2	Focus Group Proceedings on TTI deployment	All stakeholders of TTI service implementation in Europe
	D6.6	Final Conference and proceedings	All stakeholders of TTI service implementation in Europe
Targeted recommendations	D5.2	Recommendations on framework conditions for the deployment of TTI services in Europe	European Commission, decision makers at national level, private sector, European networks and associations
	<i>D6.4</i>	<i>Practitioner's handbook for TTI service implementation</i>	<i>Practitioners of TTI service implementation in European cities and regions (public & private sector)</i>
Dissemination of results	D6.1	Powerpoint presentation on framework for TTI deployment and eEurope Transport objectives and recommendations for use at conferences and outreach events	All stakeholders of TTI service implementation in Europe
	<i>D6.3</i>	<i>Good Practice in TTI service implementation (glossy edition)</i>	<i>All stakeholders of TTI service implementation in Europe</i>
	<i>D6.5</i>	<i>Joint Country reports (glossy edition)</i>	<i>All stakeholders of TTI service implementation in Europe</i>

In order to improve the practical utility of reports and ease the problem of cross-referencing, all deliverables in workpackage 5 and 6 have been conceived as self-standing documents. Since the target groups partly differ, the objective was to provide any reader of the deliverables with all necessary components to comprehend the respective topic and scope without requiring a parallel consultation of reports. For this reason, some chapters have been included in more than one deliverable (Table 0.2).

Deliverables are self-standing documents

Table 0.2: Partial repetition of deliverable chapters

Chapter heading	Content	as contained in (chapter no.)
ATLANTIC objectives and approach	General introduction to the project (for readers not familiar with ATLANTIC)	D5.2 (1), D6.4 (1)
Objectives and vision for TTI service deployment	Present policy orientation and goals at European level	D5.2 (2), D6.4 (2)
State-of-the-art in TTI service deployment	Framework conditions, current status and trends for TTI service implementation in Europe	D5.0 (Vol.I, 2), D5.2 (3.1-3.3), D6.4 (3.1-3.3)
Conceptual frame for implementation	Results of empirical analysis and stakeholder discussions regarding service delivery models, framework conditions and stakeholder positions	D5.2 (4.1-4.3), D6.4 (4.1-4.3)

1 Objectives and approach (Task 5.0)

1.1 General objectives

With regard to eEurope Transport 2002 ATLANTIC aims to disseminate current knowledge and best practice from leading examples of telematics based Traffic and Travel Information (TTI) services within the EU, Central and Eastern Europe (CEE). By so doing ATLANTIC thus seeks to support consensus building between relevant stakeholders in cities and regions, as well as with industry.

The basis for this undertaking represents to generate a pool of expertise and know-how of the state-of-the-art and good practice in TTI service deployment across Europe. However, at the outset of ATLANTIC only little systematic information on TTI activities in the EU Member States and Accession Countries has been available on the European level, mainly due to language barriers but also a concentration on national or even regional/ local markets and policies.

Therefore, a special “information collection campaign” covering EU Member States and most CEE countries has been carried out as a starting point for the activities within ATLANTIC. This substantial effort to provide an overview of the status of TTI implementation in Europe has been considered a necessary requirement for the identification and dissemination of good practice, the enhancement of stakeholder and expert discussions, and the formulation of recommendations on framework conditions for the deployment of TTI services.

The TTI implementation status analysis provides direct input to the following tasks within ATLANTIC:

- 15 – 20 good practice case (GPC) study reports giving a detailed analysis of successful TTI implementations (tasks 5.3/ 5.4)
- 30-40 interviews with key stakeholders to obtain detailed insight into key issues of TTI implementation (task 5.2)
- 5 thematic Focus Groups of 5-10 key stakeholders focussing on key issues for Telematics-based Traffic and Travel Information Services (task 6.1)
- one ATLANTIC “TTI Forum” attended by ca. 100 delegates as part of the annual POLIS conference and a
- an overall report summarising the key challenges to TTI service deployment and recommended actions by authorities at local, regional, national and European levels /task 5.5)

**Close information
gaps regarding TTI
services**

**Provide orientation
for other
ATLANTIC tasks**

1.2 Operational approach

The TTI implementation status analysis covers a total of 25 countries: The 15 EU member states, 8 CEE countries (Bulgaria, Czech Republic, Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia), plus Norway and Switzerland. In addition to project partners, 21 national experts have contributed as authors to prepare this overview on the basis of a special contract.

1.2.1 Selection and briefing of authors

The authors of the reports have been selected with a view to a direct involvement and knowledge concerning TTI implementation in their respective countries. Starting from the extensive contact data-bases of the project partners, for each country several experts have been contacted. The selected authors belong to different types of organisations (public administration, professional associations, private consultants) but have been chosen for their personal expertise.¹

Selected authors are national TTI experts

All authors have been provided with a common outline for the preparation of the national TTI implementation status analyses, comprising a general brief for the task, a report outline and a TTI service description sheet. Furthermore, an ATLANTIC/e-Europe 2002 information brochure has been prepared to help the understanding of the project and the positioning of the particular task (5.0) within. Additionally, an excerpt from the Commission Recommendation has been included in the initial information package as a key reference.²

1.2.2 Review and validation of results

All draft reports have been submitted to the respective national members of the transport working party of the IST committee and/or national government officials for review.³ The main request to the reviewers was to obtain a balanced overview of the essential aspects of TTI implementation in every country analysed. Their comments have been incorporated into the reports by the authors and/or by the WP5 leader in order to obtain a final version. All reports have been published on the ATLANTIC web-site as an input to the electronic discussion forum on TTI services.⁴

Validation by national government officials

1.2.3 Operational limitations

It should be noted that the information made available through the TTI implementation status analysis has been restricted by the following issues:

¹ See list of authors in the Annex

² See briefing documents in the Annex

³ See list of review contacts in the Annex

⁴ www.atlan-tic.net

- Quality control has been feasible only for documents produced or commissioned by ATLANTIC partners. All other information has been provided "as is", without any claims on completeness, correctness etc.
- In the case of uncertain IPR's, only links to source sites have been provided
- No systematic keywording has been undertaken.
- No systematic updating of information has been done in the course of the project, but e-forum members have been invited to add comments as well as new documents

1.3 Key issues for analysis

1.3.1 Analysis report

For the presentation of the results from the national analyses an overall structure has been developed to ensure coherence of the contents and facilitate trans-national comparison. The topics to be addressed have been derived from the initial literature survey and provided to the authors in a commented template.⁵ The emphasis in the comments was put on the overview character of the requested information, not on comprehensiveness.

The basic topics were:

- *Legal and public policy context* – institutional and regulatory framework, policy programmes and practices; including a statement concerning the status of implementation of the Commission Recommendation⁶
- *Role of the private sector* – different industry and service branches, tasks in the information chain, orientations and interests, partnerships with public authorities
- *TTI implementation status* – covering all transport modes; services already available to users, close to completion or planned for realization, services with a potential for becoming a lead application with a substantial market share; statistical information
- *TTI research activities* – programmes and projects, subject, scope and methodology
- *Key actors* – individuals and institutions with an important role in TTI implementation
- *Documents and references* – sources for detailed information

**Common structure of
analysis and reporting**

⁵ See outline for national report in the Annex

⁶ C(2001) 1102 final

In addition to these descriptive sections, authors have been required to make an explicit assessment as experts regarding TTI service deployment in their country. This assessment should also differentiate between institutional (public and private, frameworks, finance) and technological issues, giving an indicative ranking in terms of

- Drivers and trends for TTI service deployment
- Key obstacles to overcome
- Major potentials to use

1.3.2 TTI service short descriptions

As a supplement to the overall description of the TTI implementation status provided in the reports, a detailed description had to be included for a limited number of selected services in a given format. The selection of the services had to be derived from the described implementation status, thus reflecting the full range of available (basic) service types, important trend-setters and singular lead applications to give a more qualitative idea of the service spectrum.

Therefore, a general description sheet for TTI services has been developed to enable a detailed categorization of the particular features of a service in institutional, financial, technical and delivery terms. This categorization has been based on the initial literature survey and includes the following parameters:⁷

- *Institutional context* - policy framework, funding structure, information chain actors
- *Service availability* - distribution stage, access conditions, data acquisition, data distribution
- *Information contents* - modal coverage, service integration, user interaction, payment options

A total of 187 short service descriptions have been prepared for ATLANTIC. Together with the country reports, all short descriptions have been made available on the project web-site.

Table 1.1: Number of TTI service short descriptions by country

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
country	PT	ES	IE	UK	FR	BE	NL	LU	DE	DK	IT	AT	SE	FI	GR	NO	CH	CZ	SI	PL	HU	SK	LI	RO	BU
no. of TTI service short descriptions	14	36	5	8	28	5	4	1	8	7	6	5	10	4	6	4	6	6	2	2	5	3	4	5	3

⁷ See outline for service descriptions in the Annex

2 State-of-the-art in TTI service deployment: Key findings

2.1 Framework conditions

The state-of-the-art regarding framework conditions in Europe shows a complex picture. We find a considerable variety of conditions for TTI service deployment in terms of institutional settings, policy frameworks and regulation, economic and infra-structural development, as well as cultural and cognitive patterns.

**Wide variety of
framework conditions**

In order to identify the influence of framework conditions, the national status analysis reports prepared by ATLANTIC have been reviewed with respect to a limited number of framework parameters allowing only the values of “yes” / “no”. This approach has been chosen to provide a rough but comprehensive and condensed overview of the status of framework conditions for TTI service deployment in Europe (Table 2.1). The selected parameters are:

**Analysis of
framework parameters**

National policy

- Status of ITS in national transport policy as an established key element with a dedicated budget?
- Availability of an approved legal framework for the participation of the private sector in TTI service delivery?
- Availability of a national strategy for the deployment of ITS/TTI, addressing stakeholder roles and a general “road map” for implementation?
- Availability of evaluation guidelines for ITS/TTI for the (voluntary or obligatory) use by stakeholders?
- Financiation and realisation of national R&D projects for the deployment of ITS/TTI?

Data availability

- Free availability of public traffic data for service providers?
- Legal possibility for private sector parties to collect their own traffic data?
- Existence of currently operative private value added service providers (VASP's)?

Institutional frame

- Existence of a national “ITS Forum” (formal or informal) for the cooperation of public and private stakeholders?
- Existence of a formal national “ITS association”?

Table 2.1: Framework conditions and implementation levels of TTI services in Europe

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
country	PT	ES	IE	UK	FR	BE	NL	LU	DE	DK	IT	AT	SE	FI	GR	NO	CH	CZ	SI	PL	HU	SK	LI	RO	BU
ITS = key element of transport policy	yes	yes	no	yes	yes	yes (1)	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes (2)	yes	yes (2)	yes	no	yes	no	no
Legal framework for private sector	no	no	no	yes	yes	no	yes	no	yes	yes	yes	no	yes	yes	no	no	yes	no	no (3)	no	no	no	no	no	no
national ITS/TTI strategy	no	no	no	no	no	no	yes	no	yes	no	yes	no	yes	yes	no	yes	yes	yes (2)	yes	no	no (5)	no	no	no (6)	no
ITS/TTI evaluation guidelines	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
R&D projects for ITS deployment	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
ITS Forum (open cooperation)	no	no	no	no	no	no	no	no	yes	no	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no
ITS association	no	yes	no	yes	yes	no	yes	no	no	no	yes	no	yes	no	no	no	no	yes	no	yes	no	yes	no	yes	no
public data available for free	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
private data collection enabled	yes	yes	no	yes	yes	no	no	no	yes	no	yes	yes	no	no	yes	no	yes	no	no	no (4)		no			
private VASP's operating	no	yes	no	yes	yes	no	yes	no	yes	yes	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes		yes	yes	no
19 GPC's selected		1		3	2		2		1	1	1			1		2	1	3		1					

(1) Regional policy; (2) Not much emphasis on TTI; (3) Being considered in CORVETTE project; Possible in PPP projects; (5) But Information Society Strategy including TTI; (6) In development

The picture emerging on the basis of this analysis allows to draw some general conclusions. Concerning the implementation of the Commission Recommendation, only 9 out of 25 countries have approved a legal framework for the participation of the private sector so far. However, without consideration of the CEE region the ratio would read 9 out of 17 countries, which reflect the general divide across Europe.

The existence of catalysing organisations such as the 10 ITS associations (6 EU and 4 CEE) or the national Fora in Austria and Germany appear to favour the cooperation of stakeholders and the emergence of legal frameworks as well as a more strategic approach to ITS (strategic deployment plans).

Conversely, the correlation between the absence of legal frameworks and ITS strategies, and the absence of private VASP's operating is very high: none of the countries without private VASP's actually have either a legal frame or an ITS strategy. Also, the free availability of public traffic data appears to positively influence the emergence of VASP's without being a sufficient condition.

Concerning the regulation of data availability, in most countries public traffic data is provided free of charge to service providers, thus fulfilling one of the basic requirements of the Commission Recommendation. However, so far only 9 countries have approved regulations that allow private sector parties to collect their own traffic data.

Interestingly enough this does not always coincide with the existence of a legal framework for private sector participation, since four of these do not envisage private data collection. Apparently there are two different approaches to this topic: a) private data collection is integral part of a legal frame for private sector participation in TTI delivery, or b) the legal frame builds on exclusive (and well-established) *public* data collection and regulates participation of the private sector only for the later stages of the information chain.

Finally, important common features of the framework conditions for TTI service deployment in Europe are the realisation of R&D activities and demonstration projects in practically all countries, based on a great variation of financing models regarding the use of public and private funds, and the total absence of guidelines for the evaluation of ITS/TTI. While the first issue represents an important reference, the latter points to a serious gap in the general deployment process for ITS/TTI.

Catalysing organisations favour legal frames and ITS strategies

Private VASP's require clear framework conditions

Different approaches to private data collection

R&D activities - but no common evaluation guides

2.2 Implementation status

As a result of the variety of framework conditions, there is an equally wide array of TTI services available for commercial and individual users across Europe, offering multiple information content, features, and ways of user interaction. They comprise services free at the point of use, commercial pay-per-use services and less apparent forms of commercial service delivery (e.g. paid by transmission costs). Their coverage varies from pan-European to national, regional and local networks, as well as single mode, multimode and intermodal information.⁸

Broad variety of TTI services available

However, TTI service implementation in Europe is still far from the vision of TTI described above. The overall quantitative and qualitative results of the TTI service deployment process have remained below expectations, although with considerable regional differences of achievement.⁹

TTI service deployment below expectation

Regarding relative levels of TTI service implementation from a geographical point of view, roughly speaking western and northern Europe show the highest diversity and penetration, followed by a slower take-up process in the southern periphery of Europe, and a substantially lower implementation level in central and eastern European countries.

Euro-regional differences

In spite of all this diversity, some commonalities of general validity can be identified:

- basic TTI services for public transport (static timetables via phone or internet) and for motorways (traffic status in real-time via phone or internet) are becoming a common standard throughout Europe;
- more advanced services for public transport (e.g. next bus/tram/train in real-time; advice on service disruption, inter-modal journey planning) are available only in big cities and medium-sized towns, and for the railways (public & private operators). For private transport, more advanced services (e.g. real-time dynamic traffic responsive navigation; advisories in real-time on incidents on the driver's pre-specified route) are limited to private niche services; and
- only RDS/TMC (public & private) is becoming available Europe-wide.

Common implementation features

Furthermore, it should be highlighted that:

- the level of integration and coordination across spatial levels, boundaries and transport modes remains low. Cross-border TTI services are only about to emerge with the help of R&D

⁸ See also: 25 National status reports and 187 short descriptions of TTI services in ATLANTIC D5.0, and TTI service taxonomy in ATLANTIC D1.1

⁹ e.g. an initial goal of e-Europe 2002 was to have TTI services available in at least 50% of the larger European cities

(e.g. Euro-regional projects). In particular, there are still very few multi-modal and intermodal services available covering public and private transport;

- the discussion about and promotion of public-private partnership in TTI service delivery has not yet resulted in many joint-ventures and concessions to the private sector;
- most TTI services are free at the point of use - pay-services are the exception;
- so far only very few sustainable business cases have been verified for TTI service delivery, including sponsorship deals and bundling of TTI with other services; and
- for most travellers, broadcast travel news remains the primary means of obtaining TTI.

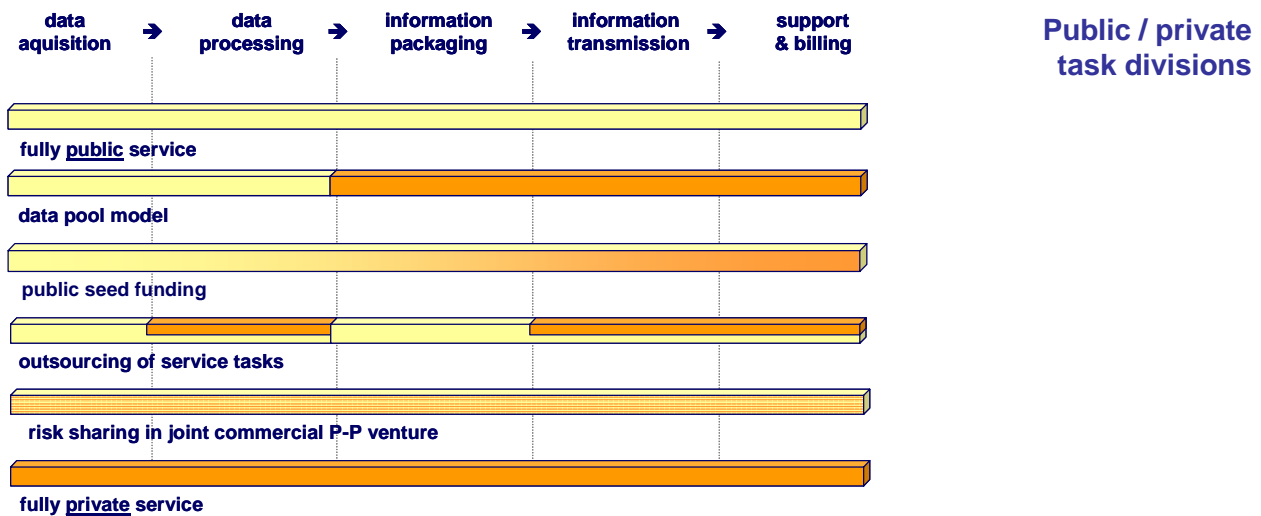
2.3 TTI service delivery models

The variety of available TTI services as outlined is based on many different delivery models regarding the roles of public and private parties and the organisation of the information supply chain. By analysing this variety, ATLANTIC has identified a simplified typology of models for TTI service delivery consisting of six basic types (Fig.3.1). Their characteristics can be outlined as follows:

- *fully public service* – all tasks undertaken by public authorities; essential for basic services with a high policy relevance (social inclusion, traffic management);
- *data pool model* – public data is pooled and offered to private VASP's; complex institutional and technical requirements (especially when integrating also private data), but a strong driver for broad dissemination on multiple channels;
- *public seed funding* – provided for the start-up of services (esp. infrastructures); important in big cities and also for CEE countries;
- *outsourcing of service tasks* – e.g. data collection, processing or transmission to private agencies; important for policy-driven services to maintain control but reduce financial risks;
- *risk sharing public-private venture* – so far only in the frame of R&D projects; creation of mutual trust and a stable alliances is key, but perspectives for risk sharing are uncertain; and
- *fully private service* – focusing utility and convenience for the (paying) user, while policy objectives may not be met or even counteracted; mainly for niche markets.

6 Basic TTI service delivery models

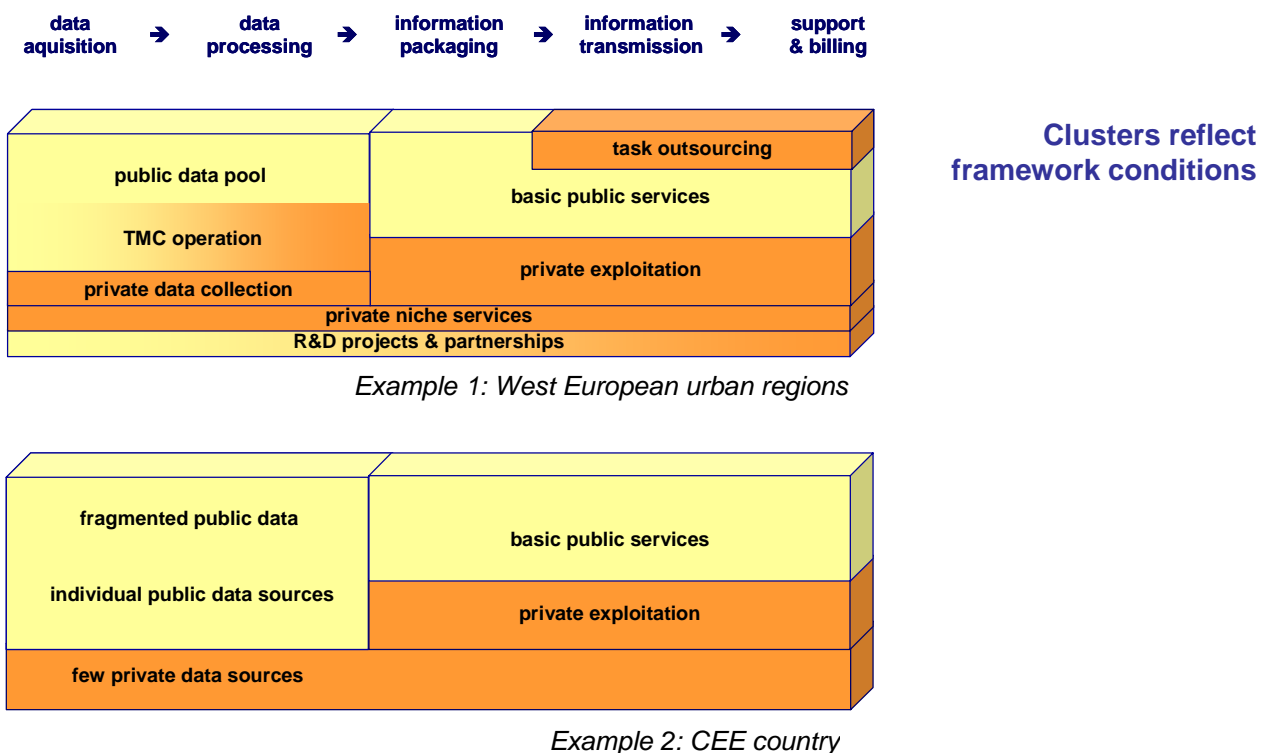
Figure 2.1: Basic TTI service delivery models and public/private task divisions



In practice, however, these models hardly ever appear in an isolated form. Within a specific country or region, TTI services are mostly in “clusters” that combine various or even all delivery models (Fig.3.2). The make-up of these clusters reflects the framework conditions in place, in particular the prevailing policy orientation and regulations concerning TTI services, but also the stage of market development.

“Clustered” delivery of TTI services

Figure 2.2: Examples of national/regional TTI service model clusters



2.4 Trends and drivers

With a view to the future development of TTI services in Europe, ATLANTIC has identified the following emerging trends and drivers that will have a significant impact.

2.4.1 Societal trends

Several basic development trends point towards an increasing demand for TTI services. The continued transport growth (business, leisure, cross-border) and traffic congestion create a general need for traffic information.

The deployment and penetration of IT applications (internet, mobile communications) will contribute to further lifestyle changes, making information availability – any place, any time – a basic necessity and expectation. These changes also have strong implications for corporate and individual image, which may influence the demand for services that support the desired “identities”.

Furthermore, a specific demand growth can be expected through demographic change regarding the increasing share of elderly and disabled persons in society.

Apparently, information provision needs to become more and more individual to reflect these changes and allow the personalisation of contents, channels and delivery formats.

2.4.2 Institutional issues

The gradual emergence of national policies and regulations dealing with TTI services indicate a shift from a technology-driven to a policy-led, but also commercial approach to deployment. The need for the public sector to provide an unambiguous framework for private actors is becoming increasingly recognised. In particular, stronger guidance through EU policy e.g. in the form of a directive is often seen as a potential impetus by national actors. This view has been expressed by stakeholders from the public and the private sector in interviews and expert meetings. Especially stakeholders from CEE countries consider EU policy an important trigger for TTI deployment.

TTI service development supports a number of key public policy themes, namely traffic management and the need to cope with congestion, modal shift, transport safety, economic development, availability of e-infrastructures and services, as well as public sector data exploitation. Each of these policies can provide an important impetus to the deployment of TTI services.

The introduction of road tolling schemes by various countries will improve the availability of traffic data and facilitate the creation of new services. The road-tolling directive proposed by the European

**Growth and
differentiation of
demand expected**

**Emerging national
policy frameworks**

**Support by
sectoral policies**

**Road tolling
schemes and EU
directive**

Commission will enhance this trend and particularly pave the way for cross-border services.¹⁰

Last, but not least, R&D programmes and projects on TTI are providing an increasing stock of knowledge and experience, and bring together the stakeholders from the public and private sectors, but also from various countries and business sectors. Despite many initially disappointing outcomes, there is a growing mutual understanding of the respective interests and the requirements to make TTI service operation commercially and politically sustainable.

2.4.3 Market issues

TTI service delivery clearly forms a commercial interest of the private sector across all branches involved. It represents an attractive marketing tool as well as a developing market in itself.

After the initial focus on developing B2C (business to consumer) services with relatively simple set-ups (which often failed to succeed), actors are increasingly oriented at more complex B2B (business to business) delivery models, involving several partners and creating opportunities for added value. .

TTI is more and more perceived as one element of a “service package” for public administrations, businesses or individual users, comprising traffic management, integrated ticketing or other services and products (retail, tourism, location-based).

Also the use of TTI as a marketing tool is increasing, for instance to improve the image (business and/or location), support customer loyalty or to promote other services and products.

Furthermore, there is also a growing recognition of the need for a more precise differentiation of TTI service markets and target groups. Thus, a more “mature” TTI market seems to be emerging, characterised by strategic alliances between actors in transport, telecommunications and information publishing, with multifaceted service chains.

On the infrastructure side especially toll motorway operators see the improvement of customer services as a priority issue in order to meet the expectations of their toll paying users. Moreover, vehicle manufacturers increasingly equip their products with IT accessories (e.g. navigation systems, emergency call) thus enhancing both data collection possibilities through the use of probe vehicle and floating car methods, as well as stimulating demand for TTI services.

**R&D improves
stakeholder
understanding**

**Public and private
interest**

**From B2C to B2B
and service
packages**

**TTI as a
marketing tool &
differentiation of
markets**

**Deployment of IT
infrastructures**

¹⁰ cf. <http://europa.eu.int/comm/transport/themes/network/english/ten-t-en.html>; COM(2003) 132 final

2.4.4 Technology issues

Technological change will further the development of TTI services. The use of the Internet is becoming more attractive as capacity and bandwidth are improving (ADSL, optic fibre, 3G and 4G mobile telecommunications). Competition between providers will contribute to lower prices and make the Internet accessible for everyone. At present user rates in the EU are still comparatively low so that there is considerable scope for improvement.

**Internet bandwidth,
costs and penetration**

Furthermore, the broad availability of affordable mobile devices (phones, PDA, digital radio) - especially if equipped with broad bandwidth (UMTS) and geo-positioning technology - will facilitate the deployment of all kinds of location based services (LBS). This will partly depend on the pricing policies of network providers and device manufacturers. Apart from the new technologies, in particular the GSM short message service (SMS) has become a very popular low cost channel for mobile information provision (push and pull) with good prospects for further extension.

**Affordable new
mobile devices**

Floating vehicle data (e.g. tracking mobile phones) is likely to become an important complementary source of traffic data at low cost, in particular for urban areas. Its broad implementation is considered a key to overcome the problem of high investments for data collection infrastructures as basic condition for TTI service generation.

**FVD to overcome
data gaps & high costs**

A particular impetus can be expected from the realisation of the EU initiative "Galileo". It will ensure future independence from GPS, improve the overall performance and enable the creation of new services through free positioning and options for guaranteed quality of data transmission.

**Geo-positioning
with Galileo**

2.5 Problems and barriers

2.5.1 Societal trends

As a general observation, relevant for TTI service development, it has become clear that the learning process of stakeholders involved in the planning and delivery of TTI services has been much slower than the process of technological innovation. This is a crucial aspect as it underlines the limited human capacities to cope with technological change and the need for flexible strategies and approaches, capable of adaptation to both human dimensions and new technologies.

**Learning process
slower than
technological
innovation**

In particular decision makers in the public sector have not become aware of TTI services sufficiently in order to reconsider their choices. The habitual orientation of infrastructure expansion to resolve traffic problems still remains a dominant feature throughout Europe and across all authority levels. To introduce ITS into everyday (transport) policy making processes and thinking therefore represents a key future challenge.

**Awareness and
orientation of
decision makers**

Moreover, language and cultural barriers throughout Europe constitute a major difficulty for TTI service deployment. The effects of the globalisation process on national and regional cultural differences, as well as the enlargement of the EU, gives continuous relevance to this issue. Language and cultural barriers are not easy to overcome in any case, but for services dealing with information they represent a particular difficulty.

Language & cultural differences

2.5.2 Institutional issues

A major drawback for TTI service deployment consists in the often non-existent, unclear, or even impeding legislation and regulations. Concerning data ownership, data exchange, institutional responsibility, liability for the user and data privacy, the absence of clear regulatory references hampers the activity of public and private actors and favours ad hoc and arbitrary approaches or unique, exclusive arrangements.

Legislation and regulation deficits

The issue of low available funds and high implementation costs represents a problem of particular relevance for TTI services. Costly hardware and software developments have been, and are still required to implement TTI services. Restrictions on public expenditure are combined here with high investment risks and an IT market still not recovered from crisis. In addition, the public sector has to deal with the specific problem of limited human resources and the lack of qualified staff.

Low funds – high costs and risks

The organisational structures and practices of the institutions involved are another important problem. TTI services touch upon different policy domains (ICT, economic development, transport) and government levels, competencies and responsibilities (authorities, police, operators, providers). The privatisation and liberalisation of transport services and infrastructure further adds to this institutional complexity. However, TTI is lacking a strong “lobby” and thus becomes subject to friction between the institutions. Especially divide that is maintained between different transport modes has a very negative impact on the development of new services, as it conflicts with the promotion of intermodality as one of the key public policy goals.

Fragmented institutional structures & practice

For various reasons, public administrations and their employees are often not in a position to put “service for citizens” first, or take a pro-active approach to TTI service goals and priorities. Transcending the competencies and everyday-practice of the individual actors would also require more cooperation between administrations (horizontal and vertical), which is often seen as an undesirable complication for TTI. This situation is especially difficult to overcome if there is no obvious institutional or individual “champion” to promote TTI development.

No motivation of public administration & lack of “champions”

For TTI services which have been implemented, a professional quality management of data to ensure the delivery of reliable and valid information is mostly lacking. However, this represents an essential requirement and pre-condition for the development of services in the long-term.

Missing quality management

The public and private sector have a strong but (in some respects) conflicting interest in TTI services, which implies a substantial complication to the deployment process. TTI services are at the intersection between universal public services and business or commercially oriented added value services. On the one hand public authorities need to provide certain services for free at the point of use to better manage the transport systems, especially in difficult or crisis situations, and for safety and security reasons, or to ensure social inclusion.

**Public / private
interest conflicts**

On the other hand value-added service providers (VASPs) are in business to attract paying customers by providing up-to-date travel information (trip planning, travel times, event warning, weather conditions, etc.) in a personalised way. As the boundary between free and commercial services is uncertain, there is an element of competition between both sectors. A public-private partnership for TTI service delivery remains a difficult objective to achieve.

Further rapid development of TTI is also hindered by continuing gaps in the knowledge base. For instance, an understanding of user needs and acceptance is still limited with regard to the variety and context of relevant factors. The effects and impacts of TTI services (especially in relation to key policy goals) are not well demonstrated. Evaluation results are rare or not comparable or transferrable. Also the understanding and awareness of feasible TTI service delivery and business models is not yet very deep.¹¹ This raises the important point that methods for assessment and evaluation of ITS investment are largely missing or are used only by a limited number of actors

Knowledge gaps

2.5.3 Technology issues

Technological change acts not only as a driver, it also introduces new risks. For TTI service deployment a key concern consists in making the “right” choices for technologies at all levels (data collection, data processing tools, data formats and exchange protocols, dissemination channels) without losing the flexibility for future adaptation. As the (so-far) unsuccessful deployment of WAP illustrates, difficult decisions have to be made e.g. regarding Floating Vehicle Data, data exchange standards or the use of 3G mobile communications.

Technology risks

Furthermore, a common data and communications architecture, with standardised interfaces, is currently missing. This is not only the case for Europe as a whole, but in practice for many nation states. Its absence complicates the communication between traffic management centres and service providers and impedes the development of intermodal and cross-border TTI services.

**Fragmented
architectures**

Regarding data availability the present gaps of data coverage and incompatibilities between data sets represent important obstacles. Especially between different transport modes, between urban and

**Missing data
& exchange**

¹¹ ATLANTIC is actually one of the first R&D projects exploring this field in depth

inter-urban networks and across national borders, the lack of data and data exchange is highly critical.

At the end point of the information chain, it is especially the user friendliness of the human-machine interface (HMI) and the clarity of information presentation that influences TTI service development – so far negatively. Experience – e.g. with kiosks or WAP – underlines the importance of a user-oriented service and interface design.

**Interface design
deficits**

2.5.4 Market issues

The market for TTI services is developing very slowly. At present user demand and willingness to pay are still fairly low due to a combination of low awareness and poor understanding of TTI on the one hand, and high expectations on the other. The small size of the market is also aggravated by the limited availability of TTI infrastructure and the means of delivery to the user i.e. new and affordable mobile devices or vehicles equipped with a “telematics box”. Furthermore, much demand is concentrated in the urban agglomerations and along major transport corridors, whereas for rural areas there is no strong TTI service market.

**Small market & slow
development**

Telecom operators could be important agents for the deployment of TTI services. However, the enormous investments for UMTS licences have put a brake on investment in TTI. The main focus on airtime selling does not, of itself, lead to the development of attractive (TTI) services, but has mainly resulted in the promotion of leisure applications. In addition, different operators are using different location referencing methods, thus complicating the provision of location-based services and roaming options.

**Role of telecom
operators
unclear**

3 Annex

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3.1 Abbreviations

TTI	Traffic and Traveller Information
ITS	Intelligent Transport Systems
TIC	Traffic Information Center
RDS-TMC	Radio Data System -Traffic Message Channel
MS	Member States
VASP	Value Added Service Provider
B2A	Business-to-Administration
B2B	Business-to-Business
B2C	Business-to-Consumer
VMS	Variable Message Sign
HMI	Human Machine Interface
CEE	Central and Eastern Europe
VMS	Variable Message Sign
3G	3rd Generation Mobile Communications
TEN-T	Trans-European Transport Networks
e-TEN	Transeuropean Telecommunications Networks
MoU	Memorandum of Understanding
SMS	Short Messaging Service
GPS	Global Positioning System
WAP	Wireless Application Protocol
FVD	Floating Vehicle Data
USP	Unique Selling Point
OEM	Original Equipment Manufacturer
OMC	Open Method of Coordination

3.2 Overview of experts and stakeholders involved

3.2.1 Authors of national reports

Austria	Mike Hillbrand TRUST CONSULT
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France	Andrew Winder, Martial Chevreuil Isis (Agence Villes et Départements)
Germany	Marc Wolfram Rupprecht-Consult
Greece	Antony Stathopoulos National Technical University of Athens (NTUA)
Hungary	Ágnes Lindenbach Inter-út XXI. Consult
Ireland	Donal Hodgins Transport Planning (International) Ltd.
Italy	Francesca Foristieri, Mario Gualdi (Accenture)
Lithuania	Marija Burinskienė, Vytautas Grigonis, Gražvydas Paliulis VGTU, Dep. Of Urban Engineering
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Portugal	Lies Goller, Susana Neves TIS
Romania	Dorin Dumitrescu General Director ITS ROMANIA - NGO
Slovakia	Tibor Schlosser ITS Slovakia Association
Slovenia	Dean Herenda Ministry of Transport
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Switzerland	Christian Egeler, Rolf Richterich Rapp Trans AG
United Kingdom	John Austin, Lesley Atkinson Ankerbold International Ltd.

3.2.2 Contacted reviewers of national reports

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AT	Werner Kovavic
AT	Evelinde Grassegger
AT	Alexander FROETSCHER
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SE	Christer Karlsson
SE	Christer Rydmell
SI	Mag. Ljubo ZERAK
UK	Cathy Jenkins
UK	Matt White
UK	Eric SAMPSON
UK	Martin BOYLE

3.3 Briefing documents for authors

3.3.1 Outline for national TTI service implementation status reports and short descriptions

Summary briefing

The profiles aim at the identification of the state-of-the-art in the development and implementation of Traffic and Traveler Information services (TTI) in the respective country. The objective is to prepare a brief overview that should also facilitate the collection of more detailed information on specific TTI services whenever this is considered to be necessary in the course of the project. The country profiles should therefore focus on the following general topics:

- *Identify the main actors involved in TTI development and implementation, both from the public and the private sector, and present their respective contributions and affiliations*
- *Highlight current TTI development trends regarding the type of services created, structure of the information chain, service availability, contents and technologies*
- *Pre-select TTI implementation reference cases that will serve to identify good practice for further analysis*

Principal reference for the identification of relevant issues and services is the Commission Recommendation on the development of a legal and business framework for the participation of the private sector in deploying TTI services [C(2001) 1102 final – see the excerpt attached or full version in all official EC languages at <http://europa.eu.int/eur-lex: document 301H0551>]

For each of the following sections only essential information should be provided. The specific points in each section are intended to give guidance for considering issues and are neither complete nor need all be addressed if not important for the respective country.

It should be borne in mind that the reader might not be familiar with the institutional context of country and/or region. Therefore, corresponding explanations should be incorporated where necessary (e.g. acronyms).

1 Institutional framework for TTI development

[Description of the main conditions and dynamics in the public and private sector that currently influence the deployment of TTI services. Make a summary statement on the status of implementation of the Commission Recommendation.]

1.1 Legal and public policy context

- *Ownership of traffic data and data collection equipment, exchange of public and private data, interconnection of transport databases (interadministrative), usage and requirements of proprietary traffic and travel data (cf. Commission Recommendation)*
- *Regulation of the information chain: data acquisition, data fusion, information supply, information transmission, marketing and support (cf. Commission Recommendation)*
- *Enabling framework, incentives and/or restrictions for TTI service deployment, framework for public-private partnerships, legal position of TTI service providers, (cf. Commission Recommendation)*

- Relevance of TTI as a policy issue (national, regional, local) in different sectoral policies regarding e.g. public information procurement, e-government, traffic and mobility management, public transport promotion, social inclusiveness, data protection and security, etc.
- Role of public authorities and institutions involved in TTI development: regional and national government, city or regional transport authorities, infrastructure owners and managers, transport operators and regulators (bus, coach, metro, rail, ferries), TTI service provider

1.2 Role of the private sector

- Role of private and commercial companies in relation to TTI development: Road infrastructure owners and managers, transport operators (bus, coach, metro, rail, ferries), other branches and companies active in TTI development and service delivery
- Value added services: forms of private sector activity in the TTI information chain
- Integration of information service contents, payment, booking and other options for transaction, including not transport-related services (e.g. Infotainment)
- Partnerships and cooperations with the public sector in relation to TTI development, revenue sharing

2 TTI service implementation and research

2.1 State-of-the-art of TTI service implementation

[Select relevant TTI services according to the three basic criteria indicated below. Assess why you think these are the important and characteristic services in your country. Attach a short description of each service based on the template “TTI services” you received.]

- *implementation*: services can be either already available to users, close to completion or planned for realization. In any case they should reflect the state-of-the-art and the array of application fields in the country
- *market prospects*: services should have the potential for becoming a lead application, or should be currently in possession of a substantial market share
- *TTI for public transport*: include at least one example of a TTI service for public transport. Otherwise add a statement on the implementation status of multi-modal TTI services.]
- *statistics on service impacts*: add information on TTI service use (e.g. percentage of inhabitants with access services, actual use of service, content levels) and service impacts (e.g. journey time savings, effects on congestion and mode choice) only when easily available

2.2 TTI research activities

[Summary of important recent and current research projects on TTI and their results. Assess why you think these are the important and characteristic research activities in your country.]

- date, commissioning and realizing institutions/partners
- subject, scope and methodology
- (expected) findings regarding conditions, demand, applications, organizational and business models, technologies, impacts, etc.

- relation to the above identified state-of-the-art in TTI service delivery

3 Key issues for TTI implementation

[Make brief statements on what you think the key issues for the future development and implementation of TTI services are in your country.]

3.1 Drivers and trends

3.1.1 Institutional (public and private) [Please rank]

1. ...

2. ...

3. ...

...

3.1.2 Technological (data acquisition and service delivery) [Please rank]

1. ...

2. ...

3. ...

...

3.2 Key obstacles to overcome

[Please rank]

1. ...

2. ...

3. ...

...

3.3 Major potentials to use

[Please rank]

1. ...

2. ...

3. ...

...

4 Annex

4.1 Key actors in TTI development

[Selective list of key stakeholders or “agents of change” in TTI development. This can be both individuals and institutions that meet the criteria indicated below. Make a summary assessment - beyond the individual level - of why you think these are the key actors in your country.]

- direct involvement in TTI implementation decisions, formally and informally, at any stage of the implementation process

- good understanding and expertise of technical, institutional, financial or business aspects in the context of TTI implementation with an emphasis on practitioners

1 institution
name / position
involvement [why is this actor regarded a key actor?]
address
phone
fax
e-mail
2 ...
...

4.2 Sources and references

[Attachment of relevant sources on TTI development in standard PC-file formats (PDF, RTF, etc.) in the language available and corresponding web-site reference list. Additionally, a literature reference list may be included]

web-site format : content provider. <http://www> . date

literature format : author(s)/editor(s). year. *title*. institution. place: editorial

1
2
...

3.3.2 Excerpt from Commission Recommendation C(2001) 1102 final

Comission Recommendation on the development of a legal and business framework for the participation of the private sector in deploying TTI services - C(2001) 1102 final

Full version in all official EC languages at:

http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l_199/l_19920010724en00200022.pdf

1. Purpose and objective

Member States are invited to develop an appropriate legal and business framework for participation of the private sector in deploying telematics-based traffic and Travel information (TTI) services in Europe.

The objective of that framework is to encourage the commercial deployment of added value services offered to travellers, along with the improvement of existing and planned public travel information sources such as broadcast and internet travel news and telephone enquiry lines.

2. Facilitation of European TTI services

Member States are invited to work together for establishing European TTI services by participating in the work of the high level working party chaired by the Commission. The Member States should inform the Commission of any national initiatives, actions or intended measures in the area of TTI services and products.

3. Regulatory framework for TTI services

Member States should take steps to harmonise the requirements for TTI services at national, regional and local levels. To this end, Member States are invited to take the following actions:

- (a) to publish and make available the requirements and applicable laws and regulations relating to public safety, traffic safety, transport and traffic management, privacy and personal data with which TTI service providers need to comply in providing their services, at national, regional and local level;
- (b) to encourage the adoption of standard contracts and service level agreements by public authorities and public agencies for the supply of traffic and travel data of all modes of transport to commercial sector operators and users;
- (c) to encourage the public authorities and public agencies who operate on-line traffic detection and monitoring equipment to make the data available in real time to all TTI service providers on equal terms;
- (d) to promote public private partnerships in the provision of TTI services.

4. Proprietary traffic and travel data

In the interests of promoting the rapid development of European TTI services and products, and to encourage market competition and quality improvement in TTI services, Member States are invited to carry out the following actions:

- (a) wherever possible, to encourage public authorities and public agencies to allow private operators of TTI services to install and maintain their own traffic monitoring equipment on public roads, operated on a proprietary basis;
- (b) to develop, publish and make available, for the benefit of all TTI service operators, guidelines for safe installation, operation and maintenance of traffic monitoring equipment on public roads;
- (c) to specify, publish and make available the requirements to be placed on TTI service provid-

ers to promptly notify the authorities of any data or information about emergencies and major traffic incidents they receive, in the interests of public safety;

(d) to adopt measures to ensure that public authorities and public agencies safeguard the commercial value of all proprietary traffic data and travel information supplied to them by private TTI service providers.

5. Observance of road infrastructure hierarchies and traffic management strategies

In the interests of ensuring that TTI products and services observe the recommended routes for through-traffic and discourage the use of unsuitable roads, Member States are invited to publish, with a view of informing TTI service providers and also the developers and publishers of navigation databases, the details of road hierarchies for through traffic for different classes of traffic as well as the existing local traffic management requirements and guidelines. Changes to the road hierarchies should be published promptly.

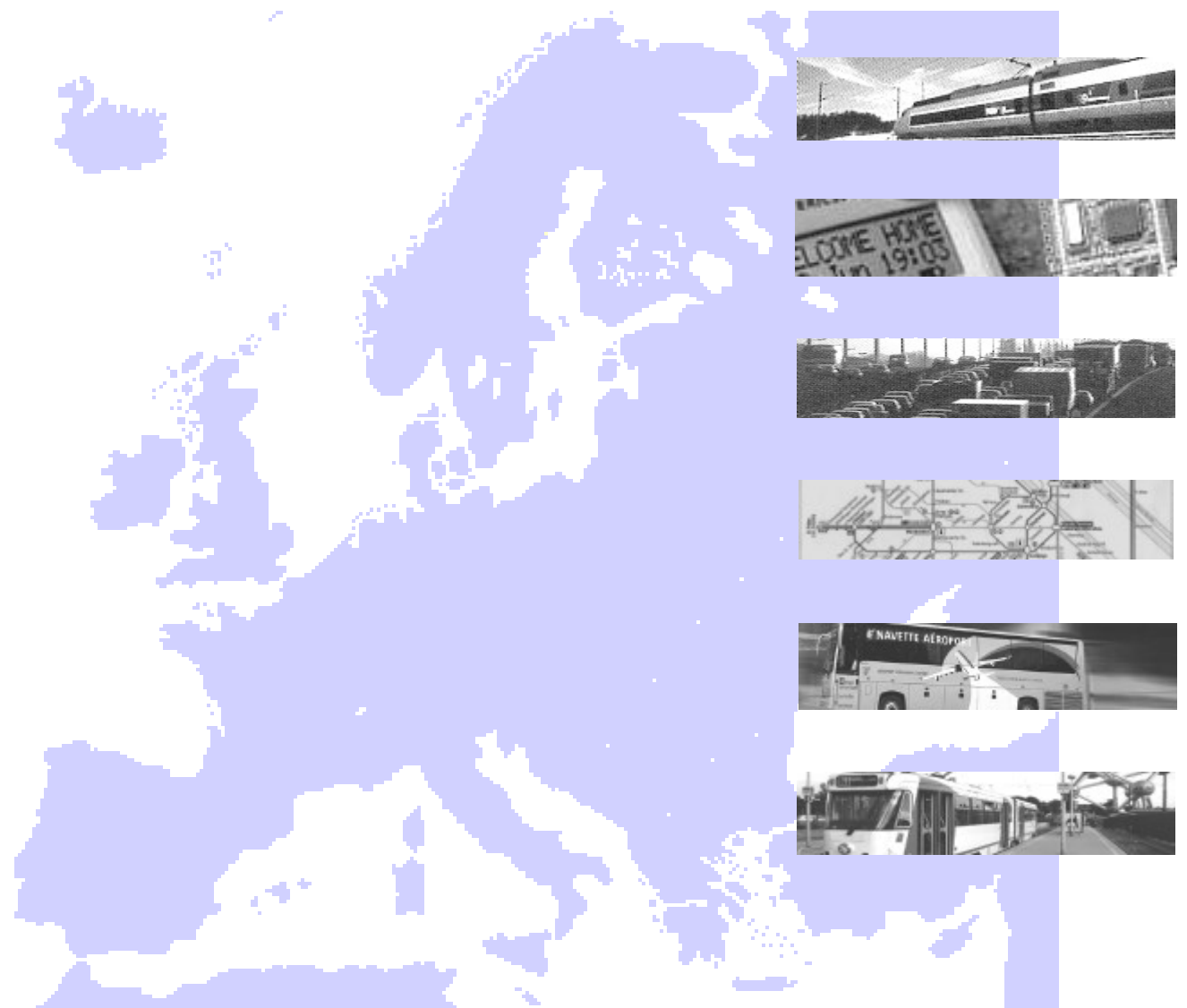
6. Facilitating TTI services

Member States are invited to ensure that TTI service providers have the freedom to develop and offer their services and products on a commercial basis. The only constraints to be imposed on them by public authorities and public agencies should be those relating to public safety, traffic safety, transport and traffic management and the protection of privacy and personal data as provided for by this Recommendation.

7. Reporting progress

Member States are invited to report progress in establishing the appropriate national framework for TTI services to the Commission within two years of the date of publication of this Recommendation in the Official Journal of the European Communities.

This Recommendation is addressed to the Member States.



& e-Europe

Traffic and Traveller Information Services for Europe

Thematic Network

Supported by Directorate General Information Society of the European Commission



What is the scope and objective of ATLANTIC?

ATLANTIC is a thematic network funded by the Directorate General Information Society of the European Commission.¹

ATLANTIC aims to enhance discussion and knowledge exchange between researchers in the field of Intelligent Transportation Systems (ITS) in the US, Canada and Europe.

Through the web-based ATLANTIC electronic Forum² and international meetings, key individuals involved in ITS research and development are participating in a common benchmarking initiative. This concerns the coverage, content and results of ITS programmes in the participating countries on both sides of the Atlantic.

ATLANTIC is also analysing the framework conditions required for a successful implementation of telematics-based Traffic and Traveller Information (TTI) services in the EU and Central and East European countries. The European Commission is defining a Community TTI policy, and ATLANTIC supports this through the collation and dissemination of current knowledge and good practice from leading examples of telematics-based TTI services.

**Enhance
transatlantic
discussion and
knowledge
exchange ...**

**... analyse the
conditions for a
successful
implementation of
TTI services**

¹ http://europa.eu.int/information_society

² <http://www.atlan-tic.net>

Towards a European TTI policy framework

In its recommendation of July 2001, the Commission invites all Member States to establish favourable legal and business frameworks for the participation of the private sector in deploying TTI services. In particular, it identifies the following key tasks:³

**Commission
Recommendation
on TTI (2001)**

- Provide and disseminate a regulatory framework for TTI services
- Adopt principles for access to public traffic data, the exchange of public and private data and the interconnection of transport databases (inter-administrative)
- Regulate the usage and requirements of proprietary traffic and travel data
- Ensure observance of road infrastructure hierarchies and traffic management strategies
- Create an enabling framework for public-private partnerships
- Facilitate TTI services and reduce constraints

³ <http://europa.eu.int/eur-lex>; Official Journal L 199/20

How does ATLANTIC relate to e-Europe?

Through its approach and focus, ATLANTIC represents an important contribution to the e-Europe 2002 initiative of the European Council and the European Commission by pursuing the overall objectives to accelerate the development of the information society in Europe, and to ensure its potential is available for everybody.

**TTI as an
integral part of the
information society**



In February 2002 the responsible EU ministers agreed to extend the e-Europe 2002 Action Plan to 2005, which has been confirmed at the Barcelona summit in March.

The development and implementation of TTI services addresses almost all the priority areas that have been identified for e-Europe:⁴

- Implement the new framework for the delivery of electronic communication services⁵
- Build up high-speed communication infrastructures
- Encourage applications for e-Commerce, especially in the business-to-consumer sector
- Ensure social inclusion
- Enhance public information procurement and e-Government
- Safeguard secure networks and data protection
- Improve mobile communications (3G networks, Galileo)

⁴ COM(2001) 140 final; COM(2002) 263 final

⁵ COM(2001) 372 final

Three basic goals of ATLANTIC within e-Europe:

● Generate a pool of expertise and know-how of good practice in TTI service implementation in cities and regions - Improve the understanding of regulative frameworks for the information chain, feasible business models, new technological concepts and organisational structures in enabling the delivery of good quality traffic and travel information, capable of supporting end-to-end trip planning across transport modes.

**Create a
knowledge basis**

● Help to establish consensus amongst public and private stakeholders on their respective roles in TTI service provision - Support operators and agencies to understand the modes of co-operation and collaboration to ensure effective TTI service provision - Help to set-up an appropriate financial, operational and institutional level of assessment (European, national, regional or local) for service quality and delivery.

**Support
consensus &
awareness**

● Provide input for European, national and local policy decisions, taking into account the specific interests and objectives of public and private actors in TTI service deployment.

**Provide
policy
assessment**

What are the respective activities of ATLANTIC?

ATLANTIC invites all principal actors and stakeholders in TTI service deployment to participate. It aims to facilitate the discussion and analysis of key issues between them, and to make the results and guidelines on good practice publicly available. Based on this philosophy, ATLANTIC has carried out several activities in parallel in order to achieve its objectives (Fig.2).:

- Experts from all 25 European countries have provided an overview of the state-of-the-art, current trends and obstacles in TTI service deployment in their respective countries.

- 20 reference cases with particularly positive results in terms of policy compliance, business efficiency and user benefits have been selected for a detailed study of their implementation frameworks and impacts. The results will also be disseminated via the European Local Transport Information System ELTIS.⁶

- Over 40 individual interviews have been held with selected practitioners from the public and the private sector in Europe, in order to obtain a detailed insight into crucial issues of TTI service implementation.

- Five focus group meetings have been held between April and December 2002 for the discussion of key topics in TTI service deployment. Each of these meetings involved 6-12 stakeholders from the public and the private sector from across Europe, concentrating on specific topics.

**Stakeholder
involvement**

**Information
collection
campaign**

**Good practice
case studies**

**Key-actor
interviews**

**Focus Group
meetings**

⁶ <http://www.eltis.org>

- Two web-based ATLANTIC discussion groups on TTI have been moderated, where experts and practitioners exchanged their views and insights on the topics identified.
- ATLANTIC has realised a major TTI services stakeholder Forum in parallel to the POLIS annual conference⁷, and has organised sessions and presentations at multiple international events such as the ITS world congresses, thus encouraging the discussion.

e-Forum debates

Conference presentations

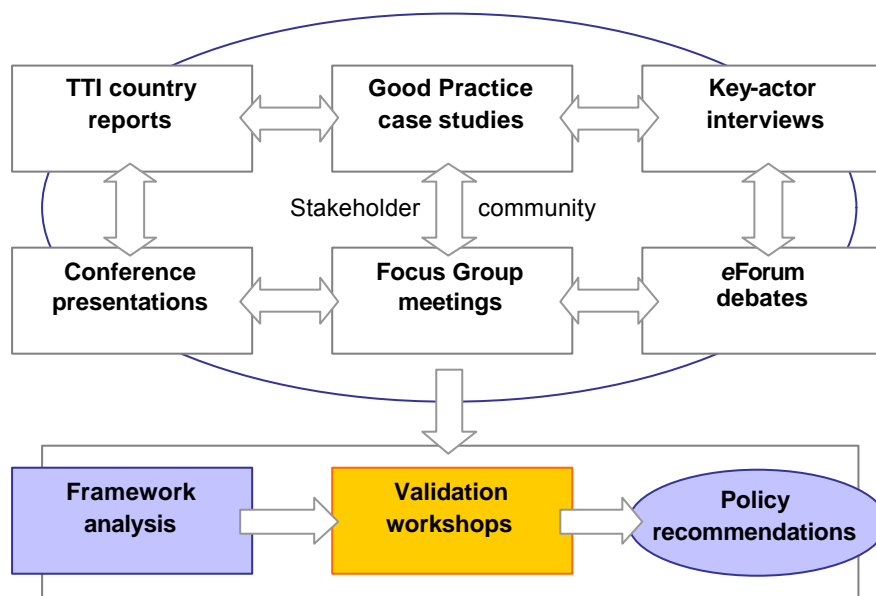


Fig.2: Worksteps within ATLANTIC: Creating practical knowledge for stakeholders and policy making

Through this process ATLANTIC will contribute to the formulation of policy recommendations and the development of sustainable telematics-based TTI services in cities and regions across Europe.

⁷ <http://www.polis-online.org>

Next steps within ATLANTIC

ATLANTIC has now entered the second major phase of the project, aiming to draw conclusions from the gathered knowledge, discussions and viewpoints.

Based on a cross-European and cross-sectoral analysis of framework conditions for TTI service implementation, the next important step will thus be to achieve a qualification and validation of the preliminary results through discussion with selected practitioners and experts.

For this purpose ATLANTIC is organising three final validation workshops, each with a specific thematic focus, inviting highly qualified stakeholders from the public and the private sector

- Workshop 1 - Framework conditions for TTI service implementation in accession countries, 25.4.2003 - Prague
- Workshop 2 - Framework conditions for TTI service implementation in Europe, 29.4.2003 – Brussels
- Workshop 3 - Guidelines for TTI service implementation in European Cities and Regions, 6.5.2003 - Brussels

3 Final validation workshops

Tentative schedule



Further questions about ATLANTIC?

For further information on TTI and e-Europe related activities of ATLANTIC, the current scheduling and thematic focus of events, as well as for comments and suggestions, please contact:

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