

PLANNING FOR DEPLOYMENT OF INTELLIGENT TRANSPORT SYSTEMS (ITS)

PLANNING IS IMPORTANT

Telematics applications and services will be an integral part of the city of tomorrow but securing these systems and services is a big challenge. Successful deployment requires the main actors to work together to develop a common vision. Sometimes institutional issues can be more challenging than technical issues. Therefore transport telematics should be included at all stages of the planning process, from concept, through implementation to evaluation.

The technical requirements include system architecture, communications infrastructure and standards; whereas the institutional framework needs to deal with the various traffic and highway agencies, road transport operators, telecommunications providers and other key stakeholders. ITS may not fit neatly under existing organisational structures and responsibilities, so some organisations may need to adapt their mission with an ITS component added.

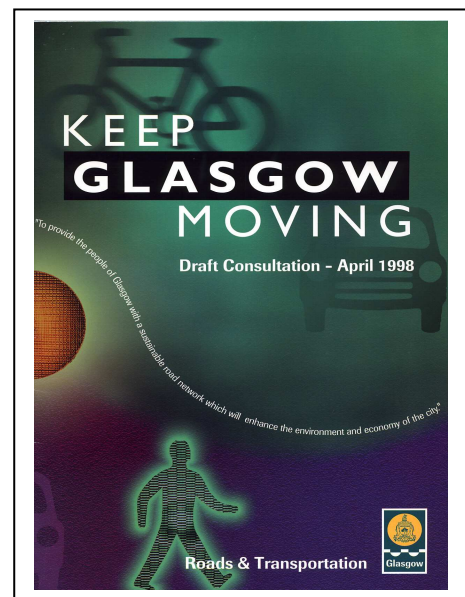
To illustrate the steps in planning for ITS, several examples are given from the cities selected for study in the CARISMA project. More details are contained in the CARISMA project fact sheets. In particular, the BAYERNINFO project, centred on Munich in Germany is used to illustrate the steps in developing multi-modal travel information to travellers and transport system operators throughout Bavaria.

WHAT SHOULD THE PLAN COVER?

Cities and regions need a strategy for deploying and utilising transport telematics which covers both the organisational and technical framework. The ITS concept plan is a method of achieving this. The plan will define the framework for future progress and

will recognise the objectives, technical and other requirements, the potential actors and their possible contributions.

The ITS concept plan is like a blueprint for transport telematics systems in a given region. It sets out what telematics can do to serve local transportation management objectives and whether individual ITS systems should be integrated. It also considers the place of 'added value' ITS services which the private sector may provide on a commercial basis. The plan provides the basis for specifying ITS system architecture requirements and the interagency and inter-jurisdictional discussions, negotiations and agreements.



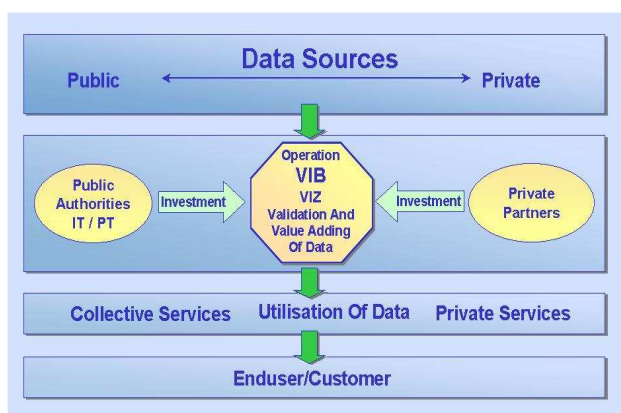
For example, ITS is a fundamental part of the Glasgow City local transport plan which stresses management, maintenance and development of the road network and includes specific goals and objectives for transport policy.

Identify the Stakeholders

Securing support from all of the major organisations and actors who will be

associated with ITS deployment is essential. The list of potential stakeholders will include regional and city transport authorities, highways agencies, public transport operators, police, emergency services, toll authorities, private sector information service providers, the media, telecommunications providers, rail, port and airport authorities, commercial vehicle associations, enforcement agencies, non-governmental organisations and the general public.

Example of stakeholders: BAYERNINFO
Traffic Information Agency - Bavaria



The public-private partnership developed for BAYERNINFO provides for the development and integration of traffic information centres and effective collaboration between public departments and private undertakings.

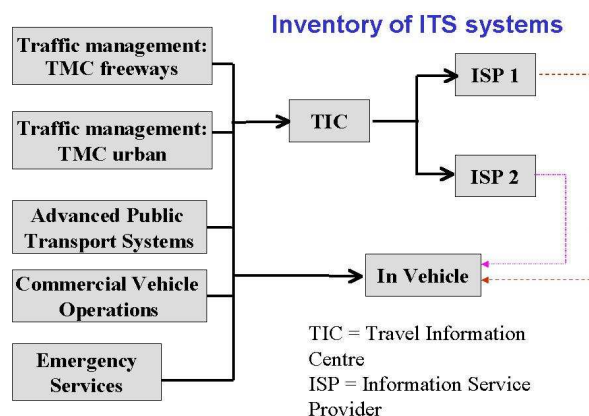
In France, the State has acted to limit inter-agency conflicts by creating a single integrated traffic agency for each of the big cities and main motorway corridors. In Greater Paris two groups of major stakeholders are brought together in the Public Authorities Co-ordination Committee (CCCP) to represent the local authorities, and the Consultative Committee on Road Information Broadcasting (CCDIR) to reflect the needs of the service providers.

The views of the travelling public are also important and are regarded as an important component of the ROMANSE project in

Hampshire/Southampton, UK, not least because the main function of ITS systems is to improve conditions for travellers. Taking account of public responses and perceptions is therefore crucial – both as consumers and voters.

Existing Telematics-Based Systems

An inventory of existing telematics systems and services is a necessary input into future ITS deployment planning. This should cover operational agreements and information sharing arrangements as well as the technology. For example some highways agencies may already be operating electronic tolling, or computerised traffic control and traffic management systems. Public transport operators and emergency services may also have some relevant investment in telematics, either in place or in the pipeline.



Source: PIARC (World Road Association) *ITS Handbook 2000*¹

ANALYSE REGIONAL TRANSPORT NEEDS

Successful ITS planning must build on an analysis of both short and longer term regional transportation needs. This will involve discussions with the major stakeholders and, if appropriate, with key

¹ Chen, K. and J.C. Miles (eds.). *ITS Handbook 2000 Recommendations from the World Road Association*. Artech House, Boston (USA) & London (UK), 1999.

decision makers and politicians. The regional transportation needs identified by the BAYERNINFO partners are shown below.

Example of Regional Transportation needs: BAYERNINFO

Objectives Of Bavarian Traffic Policies

- Avoidance of unnecessary traffic
- Resource-saving and environment-friendly organisation of traffic
- Interaction of all traffic modes on a best possible level and rationalisation of the traffic course
- improvement of traffic safety



ASSESS THE POTENTIAL FOR ITS

ITS projects will inevitably compete for funds along with all the other calls on city/region funds. The utilisation of telematics must therefore be assessed for its potential to meet short term and long term needs already identified through the normal transport planning process. ITS applications may stand-alone or be part of the overall mix of strategies to meet identified needs and goals. Examples are;

- The integration of traveller information services, motorway traffic management and urban traffic signal control in Glasgow;
- A totally integrated approach to personal mobility planning and management in Munich (BEYERNINFO project);
- Electronic tolling used to fund transport infrastructure development, but also including an element of travel demand management in Trondheim;
- The introduction of smartcard ticketing for public transport and other services in Paris and Trondheim.
- Access control measures to protect the historic downtown area of Barcelona, using smartcard permits and video enforcement methods.

The assessment must consider the technological, financial and organisational risks involved. Telematics-based options must be evaluated alongside conventional solutions, for example by comparing cost-effectiveness in the use of public funds and/or commercial viability.

Evaluate the benefits

For ITS to really make a difference to city transport problems, there must be value or benefits to a significant number of users and stakeholders. The specific benefit of the proposed programme for each group of actors should be made explicit to secure a broad basis of support. The high-profile approach used by Trondheim to explain the benefits of the Toll ring project is just one example.

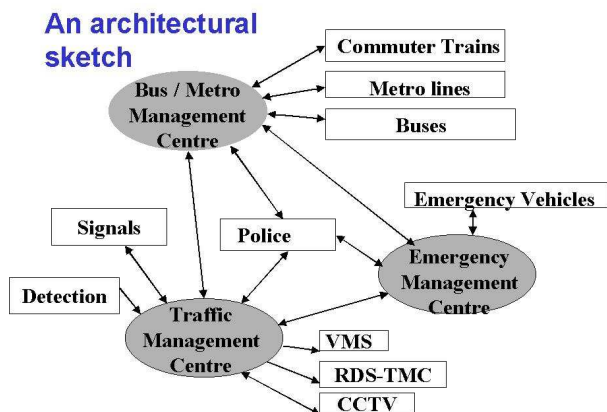
Numerous projects funded by the European Commission have shown that the use of telematics can deliver increased safety, better information, greater comfort and reduced journey times. Telematics can help network and fleet operators offer a better and more efficient service. And telematics can help city authorities implement telematics-based policies and measures to ensure a more sustainable 'intelligent' transport system. Careful analysis of what ITS can deliver for the major stakeholders will help gain support for the total programme.

DEFINE A REGIONAL ITS ARCHITECTURE

As they develop, telematics systems will deliver a wide range of services and support a diversity of functions in many different organisations. The regional ITS architecture will serve as a reference framework for telematics-based project development and design. Since the technology is purely the means to an end it will be important to keep in mind exactly what functions the systems are required to perform and for whom.

Architecture analysis helps to define the boundaries for the ITS systems being

considered and determine what performance is needed.



Source: PIARC (World Road Association) ITS Handbook 2000

The regional architecture for ITS (see the Architectural sketch above) needs to be kept up to date to reflect developments in telematics affecting the operations of the main actors. Current arrangements should be assessed to ensure that they serve the full set of actors and all the obvious inter-connections. The architecture should take account of major data and information flows between the main systems, and an analysis of the essential qualities of the transactions (e.g. electronic payment transactions, command and control instructions, video links, information transmission, etc.).

ITS Standards

Some technology choices will have more than local significance. As deployment goes ahead, there may be big benefits if different actors in the region agree to use common specifications. The main stakeholders will need to reach agreements on which are the key components. Examples are the information exchange protocols, electronic payment methods and media, communications standards, location referencing systems, etc. Thus, national and European choices on technologies or standards may be required for the telecommunications infrastructure, electronic toll tags, methods of electronic data

exchange, electronic fare media, or mobile radio systems.

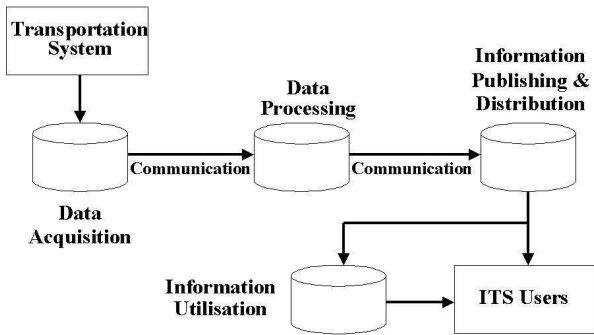
From the authorities' perspective, standards should foster a choice of suppliers, as well as interchangeability of components and interoperability of systems. Specifying open systems and the use of de facto telematics standards will help to deliver these objectives. ITS standards are being progressed in national, European and global forums. Cities and regions will need to take advice on how and when these should be incorporated into the designs of their ITS projects.

The 5T system in Turin, Italy provides a good example of regional system integration. Nine major sub-systems are integrated under the co-ordination of a tenth system – the Traffic and Transport supervisor, which monitors and controls the other subsystems. The functions of 5T range from traffic control, travel information, public transit management to parking management and others. Benefits come from sharing common communications for all the systems and from data exchange and a close integration of functions between the major systems. A new company is being formed to manage the integrated operation on behalf of the city.

INSTITUTIONAL FACTORS

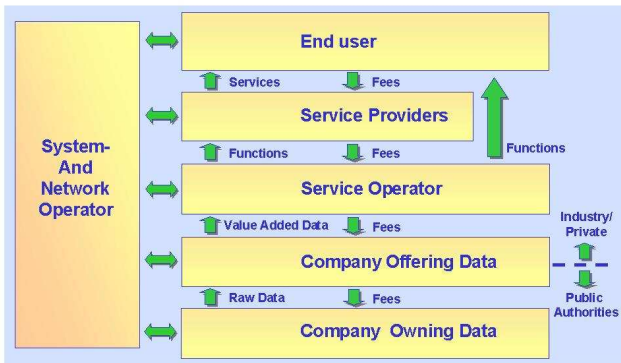
Implementation of the planned ITS systems or services requires further definition of the operational requirements between the various actors and organisations. An operating concept should be established that identifies the general roles and responsibilities of the stakeholders in the development and operation of the system. This includes establishing requirements or agreements on information sharing and traffic device control responsibilities and authority. One example is the information supply chain, which is the subject of a separate CARISMA Advice and Guidance note No 4 (*Private Sector Information Services: Creating the Business Framework*)

Examine the information supply chain



In this example, an organisational architecture can be developed for the entire service chain showing who is responsible for service delivery at each stage. Funding or a revenue stream will be needed to secure the commitment of all of the actors. This is shown in the organisational architecture for BAYERNINFO, shown below.

BAYERNINFO organisational architecture
Added Value Chain



TRANSLATING PLANS INTO REALITY

Realisation of these plans will typically be through the investment programmes of the leading actors in the region. Potential opportunities should be explored for leveraging ITS projects along with other transport investments such as highway construction or new bus purchases. An example of this kind of co-ordination would be adding the ITS communications and surveillance infrastructure for electronic tolling at the same time as a highway reconstruction project, resulting in overall

cost savings and minimised traffic disruption compared to adding the tolling infrastructure at a later date.

Phased implementation

Once agreement has been reached on scope, objectives and deployment methods, the phasing of ITS deployment will need to be considered. Availability of funds to the leading actors is likely to be the major factor. Innovative finance and procurement may have a part to play (see the CARISMA Advice and Guidance Note on this topic).

Other important considerations include anticipated timeframe for implementation, geographical reach, and the degree to which the ITS functional capabilities will be integrated. Geographic considerations involve decisions such as the initial and future system coverage area, which jurisdictions within the region will be upgraded first, which transit agencies will participate in an electronic fare project, etc. Functional issues include which functions of a system should be implemented first and which should be deferred.

Citizens in Barcelona, Spain are gradually becoming accustomed to access control measures largely due to the pilot implementations carried out as part of the GAUDI Project – first during the 1992 Olympic Games and then – on a permanent basis – in the central area. Zones have to be big enough to produce results (and hence to require automatic enforcement systems) but one advantage is that a manageable size of zone can be selected and a progressive program of implementation can be adopted.

Documentation

To complete the ITS planning phase it is advisable to document the proposals to provide a basis for discussion of the requirements with all the stakeholders. These documents will form the basis for refinement and consensus building during implementation.

A range of documents may be required, to reflect the needs of different audiences. Firstly, the general public will need to see

what the ITS initiative is intended to achieve. A popular Vision Statement is useful to highlight the key goals and benefits from the public's viewpoint. (See below).

Example: The vision for BAYERNINFO

"A Platform For New Services"

The Goal is

- to provide a service for everyone which is tailored to the individual needs of the user
- that travelling shall become easy and convenient

Services

Individual information

- utilising the Personal Travel Assistant
- at the reception desk
- at public terminals



On the other hand, a well-developed Mission Statement may be the most appropriate document to prepare for politicians, in order to gain their understanding and support.

**BAYERNINFO
Mission Statement Of The
The Traffic Information Centre Of Bavaria**

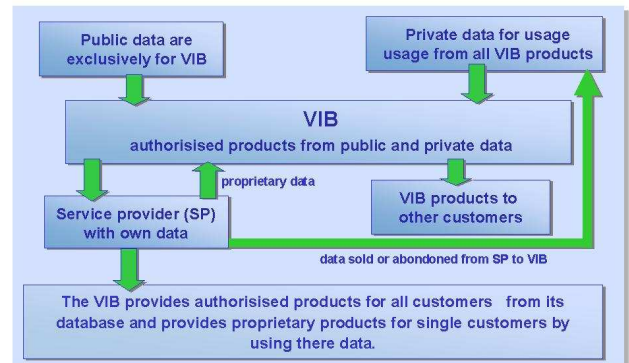
- The VIB has to obtain a public mandate, to be established as an independent and necessary institution.
- The mandate also needs to include guidelines defined by the state of Bavaria for the usage of public and private data.
- An efficient public mandate probably leads to a demand for reorganisation of existing structures for emission of sovereign data.
- The mandate has to support the statutory mandate of the Landesmeldestelle (police traffic warning centre) by significant improvement of the existing infrastructure of traffic warning systems.

The VIB needs a supporting Mission Statement from the state of Bavaria

For the professionals, whose job will be to realise the strategy, the key document will

be the outline ITS implementation strategy. Amongst other things, this will clarify the roles and responsibilities of the various stakeholders. Finally, the ITS Architecture reference framework provides the specification for the technicians to design and install the ITS systems.

**BAYERNINFO
Theory of operations: Cooperation Concept for
VIB Customers With Own Databases**



Acknowledgement

This note was prepared by the CARISMA-Telematics project team on behalf of POLIS. CARISMA-Telematics is funded by the European Commission DG Information Society.

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