



Traffic and Traveller Information Services

This leaflet is one of a series of documents from the ITS Assist Project. ITS Assist is a Department for Transport (DfT) initiative that aims to encourage and promote across the UK the use of Intelligent Transport Systems (ITS) as tools to implement local transport policy objectives.

The leaflet provides a brief overview of Traffic and Traveller Information (TTI) services, their components and the benefits that can be achieved by their deployment. TTI services are designed to provide travellers (both in-vehicle, on foot or on public transport) with journey planning and en route information. A typical TTI service will encompass information gathering, processing, delivery and display technologies. It is probable that the services will be integrated with other technologies e.g. in-vehicle navigation systems. As public transport information is covered in another leaflet, this leaflet concentrates on TTI services for drivers.





Volvo RTI System

BACKGROUND

Making better use of existing infrastructure and encouraging greater use of public transport are two important objectives of transport policy for national and local governments. TTI can help to achieve these objectives by providing the travelling public with information that will enable them to make informed choices about their journeys.

Information can be provided at two stages of any journey; pre-trip and en route. Pre-trip information enables people to plan their journeys before they set off with the latest information about the state of transport networks. They can then make choices about:

- Their mode of travel (car, motorcycle, bus, rail, tram, cycle and/or foot)
- The timing of their journey
- The best route to take
- Whether to make the journey at all

En route information will help travellers, in the light of new information, to make changes to their journey plans, if it is to their benefit. In addition, en route information can be enhanced by including other services, such as reservation of car-parking spaces and automated calls for emergency assistance.

BENEFITS

TTI services provide benefits to different groups in different ways. The key benefits are shown below.

Local authorities will gain benefits from:

- People making efficient use of transport networks, by choosing appropriate modes, timing and routes
- Providing a mechanism to help them to better manage the network, by providing accurate, timely and relevant information to the travelling public

The Public can enjoy a more efficient journey by means of:

- Reduced delays caused by avoiding congested parts of the network
- Choosing the most appropriate mode of transport for any (or part of any) particular journey
- Additional services such as car park information
- A general reduction of stress and, potentially, a reduced accident risk from being aware of what is happening on the surrounding network

Service suppliers benefit from:

- Income gained from the provision of services
- Providing additional value added services to existing customers.

SYSTEM DESIGN

All TTI services will involve the inputs of many organisations in the chain from raw data to services provided on an in-vehicle device. The architecture shown below encompasses all of the links found in a typical TTI system. Some systems will encompass all of the elements and feedback paths and some will be more simple.

The key components are described below:

Traffic and Travel Information collection and collation. The data and information can come from many sources and are combined to form the complete picture of the travel network. Data and information can come from:

- The police
- Traffic Control Centres (TCC)
- Network Managers
- Public transport operators
- Motoring Organisations (e.g. AA, RAC)
- Information Service Providers (e.g. Traffic Link)
- Automatic detection systems (loops)
- Probe vehicles (customers' vehicles automatically reporting traffic conditions as part of the system).

Data coding and distribution – each type of system will need the information to be coded into its particular format. The format at the service transmitter and at the receiver must match. Coding and distribution systems can always feed more than one format type.

The formats for the typical TTI systems include:

- Radio Data Systems -Traffic Message Channel (RDS-TMC) ALERT C
- Global Automotive Telematics Standard (GATS) – GATS provides services such as traffic information, emergency call and dynamic navigation using mobile phone and Global Positioning Satellites technology
- Graphic Data Dictionary

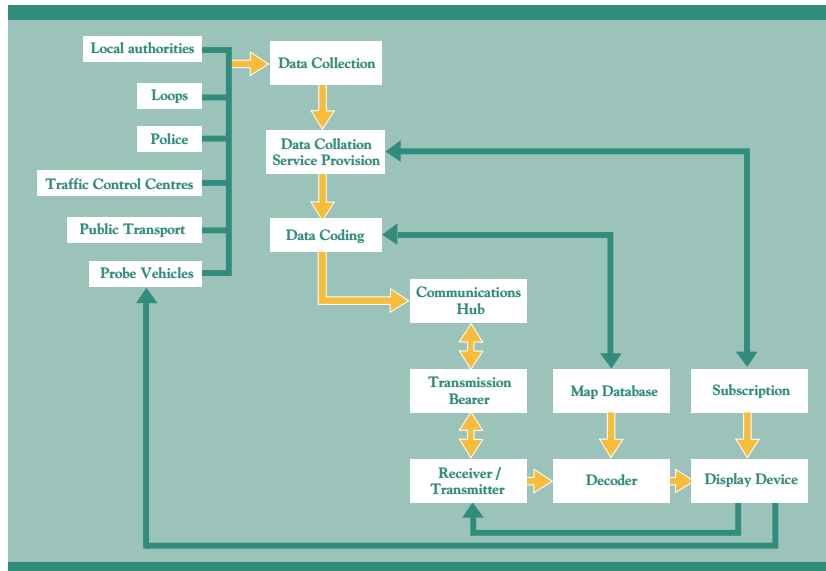
for VMS signs)

- TPEG Road Traffic Messages (RTM) and Public Transport Information (PTI) for medium/high data-rate digital broadcast bearers

passed onto further systems such as navigation systems (where the information is used to inform route choice). The display devices can come from a variety of different manufacturers but are guided by the application of published standards, which ensure

network or short range 499 MHz radio to dedicated in-vehicle devices

- RDS-TMC services from ITIS Holdings that uses conventional traffic information centres and floating vehicle data, broadcasting via nationwide FM transmissions to a variety of in vehicle TMC devices by manufacturers such as Siemens VDO and Toyota
- Variable Message Signs (VMS) along the motorways that can give simple Traffic and Travel Information to drivers passing them
- Internet services from many service suppliers such as the AA, CENTRICO and ROMANSE
- Mobile Telephone WAP services from Kizoom



POSSIBLE TTI SYSTEM ARCHITECTURE

Transmission systems can either be one- or two-way, be point-to-point or broadcast. It is possible that the technology for the downlink (to the vehicle) is different to that for the uplink (from the vehicle to the service provider).

These can include:

- Radio Data Systems - one-way, broadcast
- GSM Cellular Telephony - one- or two-way point-to-point or broadcast
- Paging or dedicated systems - one-way broadcast (e.g. Trafficmaster)
- The Internet - two-way, point-to-point or broadcast
- Digital Audio Broadcasting (DAB) - one-way broadcast systems
- Infrared or microwave (5.8 GHz) beacons for Dedicated Short Range Communications (DSRC) with vehicles

In vehicle devices decode the incoming messages and display the information to the user either in audible or visual form. It is possible that the information is

interoperability between systems and services. For instance, the majority of systems have an in-built map reference system, and it is essential that information providers use referencing protocols that are understood by the in-vehicle mapping systems.

Pre-trip devices can take the form of Point of Interface (POI) terminals, Internet PCs and Personal Digital Assistants (PDA).

Successful TTI implementations are always a partnership of the vehicle manufacturers, equipment providers, digital map providers, transmission operators, service providers and traffic and transport information providers.

AVAILABLE TECHNOLOGIES

There are several TTI technologies presently available in the UK. These include:

- The Trafficmaster congestion warning system that encompasses an end-to-end system from data collection via over-bridge sensors and roadside number-plate readers including the transmission to vehicles via the paging

TTI services that are being planned are:

- Medium/High data-rate systems delivered terrestrially via Digital Audio Broadcasting (DAB), data carriers such as DARC and SWIFT and via satellite using multimedia technologies and Digital Video Broadcast (DVB) systems
- Interactive mobile web services to vehicles using in-vehicle PC devices
- High data-rate two-way interactive systems to mobile telephones and PDAs

IMPORTANCE OF INTEGRATED SYSTEMS

All TTI systems rely on a chain of actions and modes of transport and can have an effect on other modes of transport, so the importance of integration cannot be overestimated. If information is only available from a small number of sources then the user will not be able to get a complete picture of the available travel system.

Integration of in-vehicle systems will reduce the load on the driver by automating information processing, and by reducing the amount of equipment required.

REPORTED BENEFITS

An extensive survey of users' reaction to RDS-TMC services took place during 2000(1). Nearly 400 end-users were recruited from AA and RAC members. The evaluation involved the use of Blaupunkt TMC radios ('Viking') and AA and RAC data discs. The survey also looked at TMC services combined with navigation systems.

The evaluation showed that TMC services have considerable market potential. It is believed that the number of TMC subscribers at the end of 2005 is likely to be 3.1 million. This will be 11% of all the 29 million cars predicted to be in use, and 14% of all 22 million households then with cars. It is expected that the majority of TMC subscribers will use satellite navigation units to receive TMC services. Users would pay an average of £130 a year. It was found that 87% of the participants felt that TMC had saved them time and stress.

Just under half of the Volvo Road Traffic Information System users said that they had changed their travel plans as a result of hearing a TMC message. The system is a DVD based route guidance system that provides turn by turn instructions, and which can offer alternative routes as

a result of receiving TMC real time information. This was roughly the same proportion as Viking users (45% of all Viking users). In the evaluation there were 21744 journeys recorded by Viking users. On 5% of these, action was taken as a result of hearing a TMC message.

EVALUATION

Some TTI systems and services have been evaluated (see the case of TMC above), but only for the benefits perceived by their users. To date there has been no evaluation to determine the effects on the whole transport network. This is likely to be of increasing interest as the penetration into the market of TTI services increases, particularly in urban and semi-urban areas.

FURTHER INFORMATION

The following references provide further information about some of the topics discussed in the text.

Standards

prEN ISO 14819 -1, -2 and -3, TTI via the Traffic Message Channel, Protocol, Message Set and Location Coding.

ENV ISO 14821 -1 to -8 TTI via Cellular Telephone Networks.

prENV ISO 14823, Graphic Data Dictionary for Stationary Dissemination Systems.

prENV ISO 14822, TTI via Dedicated Short Range Communications.

prENV 18234 -1 to -6 TTI via High Data Rate Digital Broadcast Bearers.

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To find out more about the wide range of ITS-related initiatives and projects supported by the DfT, and the development of ITS policies to encourage and promote greater deployment of ITS, please contact the Department for Transport's Transport Technology and Telematics Division at: its@dft.gsi.gov.uk

REFERENCES

- (1) RDS-TMC Evaluation - Final Report for the DTLR.

DfT WEBSITE www.dft.gov.uk

Details of Traffic Advisory Leaflets available on the DfT website can be accessed as follows:

From the DfT homepage, click on the Local Transport icon and then on Traffic Advisory Leaflets. Lastly, click on one of the themes to view material.

The Department for Transport sponsors a wide range of research into traffic management issues. The results published in Traffic Advisory Leaflets are applicable to England, Wales and Scotland. Attention is drawn to variations in statutory provisions or administrative practices between the countries.

The Traffic Advisory Unit (TAU) is a multi-disciplinary group working within the Department for Transport. The TAU seeks to promote the most effective traffic management and parking techniques for the benefit, safety and convenience of all road users.

Department for Transport

Requests for unpriced TAU publications to:
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Cycling



Traffic Management



Walking



Bus Priority Systems



Parking



Signs and Signals



Intelligent Transport Systems

Scottish Executive

Within Scotland enquiries should be made to:
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Llywodrath Cynulliad Cymru Welsh Assembly Government

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