Standards and Guidance Documents

Document Title	What Can ITS Deliver The Benefits of Investing in ITS
Reference	ITS 2/03

Date	2003
Publisher	Department for Transport (DfT)
Category	Guidance
Search terms	ITS; introduction; local authorities

Information:

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Department for Transport

TRAFFIC ADVISORY LEAFLET ITS 2/03

What Can ITS Deliver: The Benefits Of Investing In ITS

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 an introduction to the benefits of implementing ITS. It sets out the benefits that UK local authorities can obtain from the deployment of these systems, and also provides some guidance about ITS project planning.

This leaflet provides a snapshot of current knowledge. The DfT is commissioning a major project to develop cost/benefit information and guidance to support ITS deployment by a range of stakeholder groups, including local authorities. The information referred to in this leaflet provides local authorities with useful guidance until such time as the DfT project has completed.

March 2003

Traffic Advisory Unit

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ITS Within Local Transport Policy

ITS provide a new set of tools for achieving local transport policies. These systems provide services using modern computing and communications technologies. The systems collect information about the current state of the transport network, process that information, and either directly manage the network (e.g. traffic signals), or allow people to decide how best to use the network (e.g. incident detection, travel news).

The Benefits Of Using ITS Include:

The benefits from ITS include:

- Making travel more efficient (safer, less polluting, cheaper, better informed travel);
- Helping to achieve 'Best Value' within network management as a result of greater information gathering and improved decision making;
- Simplifying public transport use by providing accurate real time information about services;
- Reducing the effects of pollution from vehicles by better traffic management;
- Reducing the number of accidents by providing drivers with more information about conditions on the roads they are using;
- Helping drivers find the best route to their destination, and changing that route if major incidents occur on it;
- Improving the security of public transport passengers and staff by providing extra communications, CCTV and better information;
- Helping to monitor and evaluate network performance by automatically collecting and analysing data;
- Protecting vulnerable road users such as children and the disabled;
- Improving planning decisions by making more historic information available; and
- Integrating different systems by providing a mechanism for sharing information between systems and co-ordinating strategy across different organisations.

Many of the systems that provide these benefits are described in other leaflets from this series.

The following sections describe evaluation results for some local authority operated ITS systems.

Benefits Of ITS Systems

Public Transport Priority can be provided by a SCOOT UTC system, which co-ordinates the timings of groups of traffic signals. This allows an authority to implement a traffic management strategy to deal with specific issues in an area. To provide bus priority, a bus using a route is automatically detected before it arrives at a junction, and the traffic signal timings are adjusted to favour that bus. Once the bus has passed, the signal timings can be adjusted to compensate other traffic.

PHOTO COURTESY OF FABERMAUNSELL

The London Borough of Camden has reported that SCOOT Bus Priority, introduced at 10 junctions, reduced bus delay at these junctions by 22-33%, giving an 7-8% reduction in journey times. The benefits are estimated to be £88k per annum for an initial cost of £122k. (1).

Passenger Information Systems can provide passengers with an estimated time of arrival of buses at a stop; this time is updated regularly. Buses carry equipment that transmits the exact location of the bus to a central computer, this information is then processed to calculate an estimated journey time of the bus to a stop. The estimated journey time is then shown at the stop using an electronic display sign.
Passenger numbers on a bus route in Liverpool increased by 5% after a Passenger Information System was installed at a number of stops (1).

Car Park Information Systems guide drivers to car parks with empty spaces using Variable Message Signs (VMS). They are particularly useful in areas where certain car parks tend to fill quickly, while others remain relatively empty. Using the system, drivers spend less time searching for a vacant space, so that drivers save time and the network is less congested. As a consequence people may spend more time in car parks and more time shopping.
In Frankfurt the average distance travelled by a group of drivers fell by 30% following the introduction of a parking guidance and information system, with consequential benefits for general traffic circulation(2).
The Transport Research Laboratory (TRL) have estimated that if only 2% of drivers follow the guidance provided, the system pays for itself within 4 years of implementation (1).

ITS Planning

ITS can often include many functions (see section on integration). In addition, they often operate across current organisational boundaries and therefore they may require organisations to work more closely together than they may have done in the past.
To ensure that these systems are implemented in the most appropriate circumstances, good early planning of the technical specifications is important. Similarly, time spent on operations planning can make a significant difference to the benefits obtained from a system by ensuring that staff fully understand the systems and can operate them efficiently.

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ITS Business Case

A business case sets out the likely monetary costs and benefits over the life of the system and assesses any other non-monetary benefits that the system may provide. They extend beyond the standard project appraisal process to include a consideration of non-monetary and non-quantifiable benefits, such as the achievement of policy goals.

ITS are computer based systems and this differentiates them from more traditional solutions to transportation problems. However, the consequences of this fact are often not fully understood.

Traditional solutions frequently have very high capital costs, but proportionately smaller operational and maintenance costs. They are also designed to last many years without major modification. On the other hand, ITS tend to be less capital intensive, but require proportionately higher revenue costs, and are often modified as new ideas and technologies are developed.

The benefits for traditional solutions are mostly well documented and there are many techniques available for the cost/benefit comparison of different options – COBA is an example. On the other hand, ITS, being a relatively new set of technologies, does not have this body of experience and analysis behind it. The comparison of ITS and traditional solutions is therefore not straightforward and new techniques for comparison are being developed. An example of such a technique is that developed for the STREETWISE Project (see 'Further Information').

New Revenue Streams

Traditionally, funding for transport projects is obtained largely through the LTP programme. This can be used to fund both conventional and ITS projects. In view of their focus on the collection, processing and dissemination of information some ITS have the potential for generating revenue to support the overall investment process. There are several potential sources:

- The sale of data for travel information;
- Income from road charging;
- Forming partnerships with the private sector to provide added value services based on transport services; and
- Revenue income gained partnerships with developers and locally based companies to provide hi-tech services to enhance the development potential of an area.

Other funding options that may be available for ITS projects include research funding for innovative ITS and Government grants, e.g. Rural Bus Challenge and European funding options.

ITS can also be procured through the use of

- Private Finance Initiatives;
- Public Private Partnerships; and
- Partnering.

Maximising Benefits Throug Integration – The Urban Traffic Management and Control Approach

In the past, authorities buying complex computerised transport systems generally bought single systems from suppliers. Because these systems often used proprietary protocols to exchange data between the different components, it would be extremely difficult to attach equipment from other manufacturers. In addition, if an authority had two or three different systems for different services, it would be very difficult for these systems to be integrated unless they had been purchased from the same supplier, and even then it may not be simple.

However, this is changing with the development of the DfT's Urban Traffic Management and Control (UTMC) programme. Its purpose is to assist local authority network managers to make effective use of modern information and communications systems in support of an increasing variety of traffic management policies. Local authorities may derive three (connected) benefits from adopting a UTMC approach in:

- Integrating applications relatively simply, cheaply and quickly, to implement a more complex set of traffic policies – for example, linking air quality, UTC, car park management and travel information applications;
- Reducing the cost of implementing a particular set of applications and policies – for example, by sharing communication links between cameras and signal controllers; and
- Providing flexibility for the future, by providing a 'baseline' onto which additional components can readily be attached – reducing the cost risk on potential future investment.

Integration is also a major component of other DfT sponsored projects, these include: Transport Direct, Traveller Information Highway and the use of Smart Cards. Many of the benefits described for UTMC may also apply in these areas.

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Access Control in Stratford-upon-Avon

Evaluation

An earlier section discussed the role of the business case in comparing different options for addressing an identified issue. Business cases are a form of pre-implementation evaluation (to decide to go ahead or not). But a business case requires good estimates of expected benefits, and post-implementation evaluation establishes these benefits in specific cases.

It is therefore important, particularly until ITS are well established, that systems are thoroughly evaluated to allow others to assess the value of the application. As the body of knowledge increases, confidence in the systems will grow.

There are many evaluation frameworks, but one that suits ITS is summarised in the following stages:

1: Understanding the user requirements for the project
2: Describing each planned ITS
3: Establishing the evaluation objectives (in relation to the user requirements)
4: Estimating the expected impacts of the applications (relative to a do-nothing case), and then identifying appropriate performance indicators to measure these impacts
5: Setting out the evaluation methodology
6: Collecting the data and analysing it
7: Reporting the results

Further Information

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

STREETWISE – Review of Processes and Guide to the Evaluation of Projects – HA

TRL Report 220 – Review of the potential benefits of Road Transport Telematics - 1996

TRL Report 342 – Review of telematics relevant to public transport – 1998

Intelligent Transport Systems for Britain's Road Infrastructure - ITS-UK, DTLR (2001)

Automotive Intelligent Transport Systems in Britain - ITS-UK, the Society of Motor Manufacturers and Traders Limited, DTI (2000)

UTMC – www.utmc.dft.gov.uk

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

References

(1) TRL Report 220 – Review of the potential benefits of Road Transport Telematics - 1996

(2) Paul Kompfner et al (1998): ITS City Pioneers Toolbox. ERTICO www.its-assist.org.uk

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

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Cycling

Traffic Management

Walking

Bus Priority Systems

Parking

Signs and Signals

Intelligent Transport Systems

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Printed in the UK March 2003 on paper comprising 75% post consumer waste and 25% ECF pulp. Product code ITS 2/03.