

GUIDELINES FOR IMPLEMENTERS OF
Mobile Travel Information Services
for the Public



What is it about?

Concept definition

This concept focuses on provision of travel information en-route for public transport users. This can be via on-board units, variable message signs, e-kiosks on street and at stations, and personal mobile devices. Mobile Travel Information Services (MTIS) enhance convenience and confidence when travelling by various transport modes, particularly public transport.

Characteristics

- These services offer assistance to travellers whilst they are on their journeys, anywhere and at any time.
- They enhance public transport modes by improving the quality of service.
- The services can be location-based, tailored to an individual's particular needs, and can be based on real-time information.
- Implementing MTIS needs the integration of various information and communication technologies (ICT), including mobile communication, wireless, dedicated short range communication, Internet, satellite, and computing technologies.

Key Benefits

The key function of MTIS is to provide support to travellers when they are on their journeys. However, they can also contribute to:

- improved mobility, accessibility and ease of use of transport systems;
- enhanced convenience and confidence when travelling;
- increased travel efficiency and feeling of being in control of the journey;
- achieving environmental objectives through modal shift away from the private car to public transport, cycling and walking, if people are aware of the better value and social benefits of "green choices".

When implemented in conjunction with a travel training scheme, it is more likely that use of MTIS will be optimised and the overall public transport experience enhanced.

Good Practice: RailTime (Belgium)



RailTime is an initiative of Infrabel, the Belgian railway infrastructure manager. RailTime informs passengers about departure and arrival times, planned engineering works, incidents on the network through diverse channels: a website, displays, audio announcements and timetable posters.

On www.railtime.be, the 'Departures and Arrivals' section allows passengers to obtain info about stations, train numbers, departure and arrival times, platform numbers and delays. This information is also available on mobile phones, smartphones and personal digital assistants (PDAs) connected to the Internet.

The progress of trains is monitored in real time and available in table format or on a map. Moreover, RailTime provides precise information when trains are subject to change. Text entries and a small orange icon notify changes to the theoretical itinerary of a train service. All information is available in four languages: French, Dutch, English and German.

Besides a website, RailTime consists of other information tools. For example, **displays** in the station. In the entrance hall, large displays show all departing trains. Other displays provide more detailed information about destinations, the different types of train, time, route and delays. On platforms passengers get specific information about the destination, type, and time of the next train leaving there.

From 2011 onwards, every unmanned halt will be equipped with **one-stop information points**. These will combine timetables, work info, a map of the line, connections to other lines, a map of the local area, parking details, nearby bus, tram and metro stops, and an emergency phone. Voice announcements in the stations indicate train arrivals as well as any delays, platform changes and incidents on the network. Engineering work information posters at the station provide details of the scheduled works on the Belgian network.

More information can be found at <http://www.railtime.be/>

Is this something for us?

This concept can be transferable all over Europe, if information is tailored to the local (or national) context. It provides extra flexibility for the traveller and stronger feelings of being in control of the journey.

Key conditions for implementation are:

- understanding of end user needs and requirements;
- a viable business model;
- identification of appropriate technologies and outputs;
- strong political support.

“Mobile travel information systems open up new opportunities for delivering quality public transport services, improve operational practice; they contribute towards “greener travel choices” by making public transport easier to understand and therefore more convenient. Almost everyone has access to a mobile device, and with latest generation mobile devices the possibilities for offering new information services are endless, such as creating bespoke travel itineraries, location based services to help those in unfamiliar areas and real-time updates and revised plans when journeys are disrupted or delayed.”

**Dr Chris Queree, Chairman ITS (UK)
Public Transport Interest Group**

“Trondheim aims to promote public transport by raising the quality of service offered. WiMax has already been introduced on the city’s tram network. Now, ubiquitous, seamless, multi-modal real-time information services are to be delivered on screen and to mobile devices, together with an integrated communication and ticketing system. This forms part of our objective to deliver a fully sustainable transport system which also includes improved cycling and pedestrian facilities, road use charging, car pooling and electric vehicles.”

Birger Elvestad, Trondheim Kommune
(NICHES+ Champion City)

Check list

City size	Citywide, but should be compatible with nationwide MTIS.
Costs	<ul style="list-style-type: none"> • The cost of a new system depends on the level of services that will be provided by the system. A high level of personalised and context-aware information services can be costly as a significant amount of data (e.g. individuals’ dynamic needs and transport network data) must be collected, analysed and disseminated; • Marginal once system is up-and-running.
Implementation time	2-3 years between planning and system implementation
Stakeholders involved	<ul style="list-style-type: none"> • Local authorities and government departments; • Public transport operators; • Technology suppliers (e.g. network operators, computer specialists); • Passenger groups; • Data owners; • Emergency services.
Undesirable secondary effects	Reliance upon new technologies could increase the social exclusion gap for certain user groups. User interface design is important. If MTIS include enhanced road traffic information services new car-based trips may be generated.

Benefits & Costs

Benefits

MTIS bring benefits to all types of transport users. They:

- provide **extra flexibility** for travellers and a stronger feeling of being in control of the journey, and as such can contribute to enhanced convenience and confidence when travelling;
- provide **assistance** to public transport users by guiding them throughout the journey, and especially at interchanges, **in real-time**;
- will generally have **political** support, as by improving the public transport experience, they can provide increased patronage;
- increase **economic** efficiency by adding value to existing public transport services and transport networks;
- reduce **social** exclusion and promote **independent** travel opportunities by making existing transport networks and public transport services more accessible.

There may be positive **environmental** side-effects through induced public transport trips and possible lasting **loyalty to non-car modes**.

Costs

The costs of MTIS depend on the level of services that are to be provided.

Highly accurate, real-time, location-based, personalised and context-aware information services can be costly as they require high levels of technological integration and sophisticated management between partners.

Systems also need to be operated and maintained, although costs are marginal once the MTIS is running.

If information services are to be provided free to users (i.e. without subscription), then additional revenue sources need to be considered. Advertising existing transport services through MTIS is one possible source of revenue, which could attract commercial investment towards the MTIS.

The main impacts and measures of success are efficiency, safety, environment and accessibility. MTIS can add value to public transport services, and improve efficiency of transport operations and networks. However, the real economic impact can be difficult to quantify.



«ITS4mobility gives passengers access to travel information in real time at the bus stop, on board the vehicle and through the web»

Photo: Volvo Buses

Users & Stakeholders

Users and target groups

The travelling public using non-car modes are the end users of MTIS. They can be categorised into four target groups:

- **public transport users** who travel by single or multiple public transport modes. This group requires travel alerts on timetable deviation, delays and incidents based on real-time information, practical and precise information on transfers between modes, and street-level navigation for end-legs;
- **cyclists** who require up-to-date and comprehensive information on routes and secure parking options;
- **pedestrians** who travel by foot. Public transport users are also pedestrians at some stage of their journey. Members of this group require precise instructions to reach their destination with concerns of safety and accessibility paramount, particularly for people with mobility impairments;
- **multi-modal transport users** who travel by a combination of two or more transport modes. Their needs depend on what transport modes will be used during the journey.

Key stakeholders for implementation

There are three key areas within which stakeholders fall: end users, data providers and technical specialists.

Local authorities

A data provider, playing a key role in initiating the project, then establishing and managing policy and planning objectives.

Emergency services

Both data provider (incidents and diversions) and end user, utilising data for their own operations.

Public transport operators

Both data provider and end user, applying information received from use of MTIS to enable more efficient operational practices. They play a key role throughout the duration of the project.

Information and communication service providers

Both data provider and technical specialists, providing key infrastructure and platforms to the delivery of mobile information services including data collection, analysis and dissemination. They play a vital role and will be involved throughout the duration of the project.

Travelling public

Naturally, the external end user, his application and assessment of systems are vital to the success of MTIS.

ITS4Mobility, Gothenburg, Sweden

ITS4Mobility, developed by Volvo and Consat during 2002, is a second generation system based on the innovations of core technical partners, research institutes and public authorities (including the public transport authority) dating back to 1984. Key end users are public transport users, car drivers, maintenance managers and traffic management personnel.

Essentially, the system is ITS integrated with a real-time passenger information (RTPI) system that

enables tracking of bus locations, two-way messaging, bus arrival forecasts, and other services including signalling to traffic lights and requesting priority treatment. It also gives traffic information to drivers and traffic managers.

Today ITS4mobility tracks over 450 buses and trams in Gothenburg, providing real-time passenger information to traffic controllers, information officers, passengers (at more than 140 at-stop displays), and via the Internet and WAP. The system can use any radio communications protocol and can be installed for any size of fleet.

From concept to reality

Preparation



There are many potential stakeholders involved with the delivery of a MTIS, so it is important to involve all parties from the very beginning of the preparation phase.

Key aspects at this stage

Creating political support

It is important to have political support for MTIS. Politicians utilise travel and traffic data for transport policy or wider objectives (e.g. economic regeneration), and are high stake, high influence stakeholders.

The political issues are fewer at this stage because it is relatively easy to “sell” the concept to the public, although there may be some concerns about privacy where personal data are used in MTIS. It is important to address and alleviate these concerns as early on in the planning process as possible.

Understanding all user needs

When preparing for MTIS, it is crucial that all user needs are fully understood, especially when considering the delivery of personalised or user-specific information. Some factors, such as age, gender, work status, ability to use ICTs, personal impairments, preferences in relation to information formats and travel patterns, and locations of home and other places often visited can be known through the creation of a personal profile. Other factors, particularly those that are changing dynamically during a journey, such as familiarity with the journey/area, position on the map, type of personal device, context and available sources in the

surrounding areas, also need to be understood. Otherwise there is a risk of developing a system that will not meet the end user requirements.

Improvements to operational efficiency often underpin the deployment of systems which also yield benefits to the traveller.

Information from MTIS can be used by traffic managers, service operators or transport planning authorities to understand travel patterns, change operations, re-engineer management structures, or justify improvements to infrastructure.

Understanding the technology

The technology infrastructure is essential but may be a key barrier to the service providers if it is prohibitively expensive or in circumstances when it is unclear what is the most appropriate system to purchase.

MTIS differ from their web-based counterparts as they make use of a number of ICTs, particularly mobile and wireless networks. The terminals used to present information vary greatly in display size, processing capability, network bandwidth and storage capability. Hence an open technology infrastructure which provides seamless and easy access is vital to user acceptance of MTIS.

It is important to select a technology platform that is interoperable with future technology innovations in mind. Otherwise, future developments may require the planning process to be repeated over and over again.

Another potential barrier to successful MTIS is the social implications and potential exclusion of certain users if MTIS are totally reliant upon new technologies. During the preparation phase, **user-centred design** is key to preventing user frustrations and increasing the use of the services.

Resolve any legal disputes and issues

Depending on the scope of the planned services, it may be necessary to engage different data providers and broker data-sharing agreements to ensure all providers continue to share essential data for MTIS. Early data sharing agreement between partners is crucial to successful implementations. Gothenburg's experience demonstrates the core role of technical specialists. Since 1984, the city's MTIS has relied upon the skills of technical specialists to ensure a reliable and effective service.

Make the public aware of the service

It is essential to foster strong public support through effective promotion of MTIS, making use of advertising, stakeholder engagement and information provision. MTIS provide the capability to introduce a highly detailed and personalised travel service in real-time, demonstrating exciting new technological advances (see Traveline NextBuses case study).

Accessibility for users with impairments is also enhanced through supply of on-trip information with the understanding of their specific needs: examples include hands-free audible information for visually impaired users, wheelchair users or parents travelling with children. Nevertheless, it is important to ensure that these users are aware of the customised services available to them. MTIS also offer the opportunity to promote existing and new transport services so that users are always aware of alternatives.



Traveline NextBuses Service
Photo: Kizoom (Antonina Mamzenko)

Check list

Ready for implementation? ✓

- | | |
|----------------------------------------|--|
| Strong political support for MTIS | |
| In-depth understanding of user needs | |
| Agreement of all stakeholders involved | |
| Eradication of technological barriers | |
| Dedicated marketing of MTIS | |

Traveline NextBuses, UK

Traveline was established as a pre-trip multimodal travel service in the UK. In an era of personal mobile communication devices, timetable data can be delivered to people whilst travelling and can be enhanced by real-time information giving expected times based on the actual position of vehicles. The first step was a SMS service listing the next buses at a stop which has been enhanced into 'NextBuses', a mobile internet service with Google maps showing bus stops in the area. Vodafone, Three and T-mobile have all put the service on their portals and various iPhone and Android apps use an API access to provide the NextBuses service. Using the built-in GPS allows the traveller to start with the map of the area they are in. These services are proving very popular and "promote themselves" in the apps stores.

The wider availability of computers and access to mobile devices means that people can use A-to-B journey planners much closer to the start of travel, or to replan their journey during travel. Having real-time information in the journey planner allows for individual journey legs that are late, or connections that are expected to fail, to be 'flagged' to the user who can then opt to replan his journey avoiding the late running services. Journey planners that work this way are being tested and itinerary management is expected to take off soon, which will mean that journeys planned on the desktop can be shared with friends, viewed on the mobile device, and followed on navigation systems. The interest shown in Traveline's Public Transport data by mobile and navigation system providers points to these international companies taking the lead in disseminating travel information in the future.

From concept to reality

Implementation



Strong political and administrative leadership and continued support over the total lifespan of a MTIS project is essential for a successful implementation.

Key aspects at this stage

Focused project management

The core project team should be small and focused, comprising the key stakeholders from the outset, and adding further stakeholders as and when necessary.

Roles should be clearly stated, and a clear, comprehensive contract drawn up. There should be no grey areas, risks should be identified and contingencies put in place. Interoperability between partners should be identified and followed. Where required, a manager should be appointed to ensure products from different suppliers are integrated strategically.

Technical specialists will have a strong role in the implementation and testing of services and technological platforms. However, overall success will depend on the political and administrative regime working together towards the specific objectives in the adopting city.

Realise the potential scale of the MTIS

One of the key barriers to a successful MTIS is when the service providers fail to fully understand the scale of the service required. The diverse range of technologies involved in providing MTIS mean there are a number of potential interoperability problems that need to be overcome before launching any full demonstration.

Ensure a successful debut

The main aim of mobile travel information services is to provide the public with comprehensive, real-time, reliable on trip information. If the initial impression of a MTIS is one that is unreliable, it will be difficult to gain future public confidence in the system.

A secondary aim is to provide transport planners and emergency services with data which assist them in carrying out their roles effectively. The whole system must work reliably from the implementation phase into the full operational phase to instil confidence in the users that required services will be delivered when needed.



Navigation information on a PDA
Photo: UNEW

Empowered Traveller, Manchester, UK

"The Empowered Personal Travel Itinerary Monitoring Service (EPTIMS) delivers a robust, real-time travel service offering for travellers that will encourage them to make better use of existing Public Transport infrastructure by providing a level of assurance throughout the entire journey experience.

Using GSM cell-based location technology EPTIMS will provide users with a mobile, personalised application to assist and reassure them when using Public Transport. By inputting either postcode or street address information for the start and end locations, EPTIMS will enable people to make the right choices during their journey such as what route to take, when to disembark from a bus, and what alternatives exist during a disruption. All information will be delivered with minimal infrastructure using the power of the individual's mobile device to process and present information.

The EPTIMS project seeks to address social exclusion by promoting equality of opportunity by enabling people to extend their travel horizons (which can be defined as the distance or location that people feel able to travel to when accessing key facilities).

A number of factors can impact on the decision making process that influences the individual's travel horizon and the subsequent decision on that journey. The key factors include distance; requirement to interchange; safety and security implications. Travel by bus will be simplified through EPTIMS, especially for passengers with hearing impairments, infrequent travellers, passengers facing language barriers and people travelling in an unfamiliar area."

Integration with wider policy initiatives

MTIS can play an important role in meeting wider policy initiatives if implemented correctly. For example, if environmental impacts are considered to be particularly important, there is a specific need to engage both politicians and the public to accept the importance of these issues in order to work towards achieving environmental targets. MTIS can be used as a tool in the promotion of alternative modes, and increasing patronage on public transport.

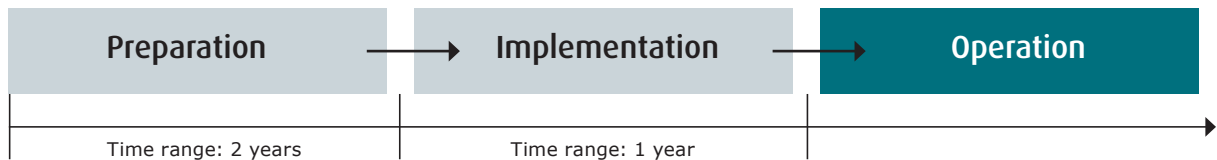
The most successful measures are therefore those which can be perceived as having personal benefits rather than social impacts. For example, CO₂ targets have to be achieved, but this particular pollutant may not resonate with people at an individual level; it may be easier to engage the public when attempting to reduce other pollutants that they perceive as impacting on them more directly, e.g. noise.



On-street information kiosk
Photo: UNEW

From concept to reality

Operation



MTIS have been successfully implemented in a variety of guises on different scales in cities across the world.

The following are deemed important in ensuring the long-term success of MTIS.

Key aspects at this stage

Maintain stakeholder relations

The core project team needs to manage the delivery of the MTIS to ensure that all parties involved are regularly engaging with each other.

Ongoing consultation with end users

MTIS have a key advantage in that they can be personalised to meet specific requirements of individual end users. It will be beneficial to conduct regular consultations to ensure the requirements of each user are being addressed, and what developments they would like to see in the future.

Continue marketing strategies

It is important to maintain the strong political and public support introduced during the preparation phase through to full operation of a MTIS to ensure the services delivered will be used.

Whilst many regular travellers will make use of MTIS, there will often be a section of the market who are potential users of public transport, but are unaware of the services on offer to them. A dedicated, long-term MTIS marketing strategy aimed specifically at these individuals (for example, the IndiMark concept pioneered by SocialData) could improve the uptake of MTIS amongst a wider audience.

Explore future technologies

The technological platform used to develop MTIS must be able to incorporate new advances in technologies, so future scoping exercises should be undertaken.

The potential of new technologies must be explored before any integration with existing MTIS is considered.

Future challenges for MTIS

Key challenges for future MTIS include:

- possible movement from centralised models of MTIS (e.g. those launched by public authorities) to small applications that co-operate with each other (e.g. NextBuses);
- obtaining open data from transport operators and the public sector;
- incentives for travellers to share personal data and journey histories in order to link pre-trip info with on-trip info to provide on-trip feedback to mobile devices;
- understanding the future role of on-board infrastructure in the light of more people carrying more sophisticated mobile devices with myriad applications;
- coverage of wider geographic areas and linkages between systems, services and applications in order to provide seamless, multi-modal pan-European MTIS.

Further information & contacts

Case Studies

iBus, Transport for London:

<http://www.tfl.gov.uk/corporate/projectsandschemes/2373.aspx>

KAMO Mobile Services, Helsinki:

<http://www.hel.fi/>

ITS4Mobility (Full System), Volvo Buses:

http://www.volvobuses.com/SiteCollectionDocuments/VBC/Global%20-%20ILF/Downloads/ITS4mobility_Technical_description.pdf

Traveline NextBuses Service, UK:

<http://www.traveline.org.uk/nextbuses.htm>

RailTime, Belgium:

<http://www.railtime.be/website/Default.aspx?lang=NL&type=i>

BVG Mobile Journey Planner, Berlin:

<http://www.bvg.de/index.php/en/17101/name/Journey+Planner+for+Mobile+Devices.html>

Socialdata's IndiMark

<http://www.socialdata.de/leistungen/marke.php>

Sustrans TravelSmart

<http://www.sustrans.org.uk/what-we-do/travelsmart>

GMPTE "Empowered Traveller"

<http://www.logica.co.uk/we-are-logica/media-centre/news/2010/logica-to-develop-innovative-solutions-for-people-to-better-manage-their-journeys/>

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The mission of NICHES+ is

to build on the success of the first NICHES project by stimulating a wide debate on innovative urban transport and mobility between relevant stakeholders from different sectors and disciplines across the EU and accession countries, in order to promote the most promising new urban transport concepts, initiatives and projects and transfer them from their current "niche" position to a mainstream urban transport application.

This publication is part of a series of 13 publications presenting the NICHES+ outcomes.

NICHES+ Champion City: Trondheim, Norway

Trondheim aims to reduce the environmental impact of car use throughout the city by promoting public transport use. To improve the attractiveness of public transport, the quality of service offered is being improved through the provision of mobile travel information services, including wireless coverage on the tram network (to be extended citywide) and real-time information on tram and bus routes. These solutions will make tram and bus travel an excellent alternative to the car: travellers can access real-time travel information during the trip on mobile devices and on screens; two-way communication between passengers and transport operators becomes possible; and passengers will be able to use their travel time for work or leisure.

Trondheim and the NICHES+ team are working with users and stakeholders including Trondheim Kommune (the local authority), public transport users, Veolia Transport, Wireless Trondheim, Miljoedrift AS (real-time information supplier), local technology providers and transport authorities.

Title page photo:

Real-time information display, Volvo Buses

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Further information on NICHES+

www.niches-transport.org
www.osmose-os.org