Standards and Guidance Documents

Document Title	Leicester - Star Trak Real Time Information System
Reference	ITS 13/03

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

This document is also available on our website at www.itsnow.org

Any enquiries regarding this document should be sent to us at info@itsnow.org.

TRAFFIC ADVISORY LEAFLET   ITS 13/03

Leicester - Star Trak Real Time Information System

This leaflet is a case study of a Local Authority implementation of an Intelligent Transport System (ITS). It 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 ITS solutions as tools to achieve Local Transport Policy Objectives.

Star trak is an Intelligent Transport System in Leicestershire that monitors buses and provides transport information for passengers.

The system is one of a package of measures to provide quality bus services and is designed to encourage commuters to use the bus as an alternative to driving.

The system tracks the position of buses using GPS systems, this information is used to predict their time of departure at their respective bus stops and is displayed at selected stops on LED signs. On board the buses, the name of the next stop is displayed on a text screen. In addition, if a bus is running behind timetable a traffic signal priority system is activated to favour the bus.

Public Transport Information in Leicester

Background

An important transport policy for Leicester City Council and Leicestershire County Council is to encourage the use of sustainable means of transport. This policy is implemented partly through a strategy of improving bus services.

The authorities agreed that a key to improving the bus services would be to use Intelligent Transport Systems (ITS). So, funded partly by the Leicestershire Local Transport Plan (LTP), 'star trak' was born.

To complement the star trak scheme, the local bus operators have funded 125 new low floor buses. To match this, the Councils are in the process of implementing low floor access at about 1000 bus stops throughout the City and County. To further help to reduce congestion, there are plans to introduce more Park & Ride schemes around the outskirts of the city.

Foundations of the Project

Star trak was conceived by the Leicestershire Quality Bus Partnership (QBP), whose members are Leicester City Council, Leicestershire County Council, Arriva Fox County First and KinchBus.

The QBP set up 'work groups' attended by members of the QBP and other invited parties. These monthly meetings were specifically designed to:

- Keep all the partners up to date
- Allow the sharing of new ideas
- Discuss problems

The workgroups identified the essential functions for the system. These were:

- Real time bus location monitoring
- Real time passenger information systems such as LED signs at bus stops
- Intelligent traffic signal priority for buses
- A service-monitoring database that keeps detailed bus-by-bus records of the actions of each bus

The resulting system was procured from a German company, Init GmBH.

The System Components

For the public, the key features of the star trak scheme are the on-bus and at-stop real time displays and Internet and Short Message System (SMS) access through mobile phones. To support this, the key system requirement is the accurate monitoring of bus locations in real time. This is achieved using bus mounted Global Positioning Satellite (GPS) technology. Bus locations are regularly transmitted via radio to a central computer. This computer calculates the estimated departure time of the buses at their next stops by extrapolating from the current position and taking into account historical data. The calculated departure time is then passed by radio to the appropriate bus-stop signs, where it is displayed to

waiting passengers. This process is illustrated in the following diagram.

The central computer manages the information for the bus stop and bus displays as well as providing a management database and monitoring system.

The system monitors:

- Arrival and departure times at bus stops to the nearest second
- Other occasions when the doors are opened
- Deviations from the standard route and timetables

At stop display

This monitoring enables the journey time estimates to be dynamically updated. It also provides fleet management functionality allowing the bus operator to know where all of their buses are at any moment to an accuracy of approximately 5 metres.

All of the monitored information is stored on a database, from where a sophisticated statistical package can produce reports and summaries relating to schedule adherence, headways and general performance statistics.

The on-board bus signs display visually and audibly the name of the next stop. The signs use a sixteen-character display.

The at-stop signs are of various designs, but all use amber LED technology to display the next and following service at the stop as well as the estimated time to arrival.

Schematic of Star Trak System
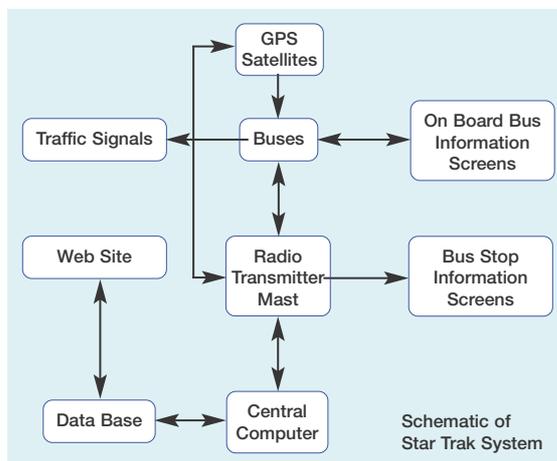
Another element of the system is bus priority at signal-controlled junctions. If a bus is running late, it automatically transmits a variable 'lateness code' by radio to the signal controller as it approaches. The signal timings are then adjusted to favour the bus in a scale

On bus display

according to the lateness code. The priority allows the bus to reduce its lateness improving reliability.

Additional functions allow the public to access information via a web site (www.star-trak.co.uk/) and via the SMS incorporated into mobile phones. Star trak is the first system to supply real-time information electronically to users via SMS.

The SMS services works in the following way. Each bus stop has a unique six-letter code, which is displayed at the stop (for example, the code for Leicester Railway Station is leidgm). To obtain information, the user texts the code of the bus stop they are interested in to 07734 9 07734. Within 30 seconds, the user will receive a reply detailing all the services to arrive at the stop within the next hour. To find details of a specific service, the user enters the service number after the bus stop code. If the bus is not equipped with GPS equipment, the system returns timetable information that is marked "tt". The cost of the service is charged at the usual text rate.

TURNING THE PROJECT INTO REALITY

Funding

The five members of the Leicestershire QBP initially funded star trak. Leicester City Council and Leicestershire County Council funded it from their LTP and the rest of the funding came from the three bus operators.

Contributions to further phases have been received directly from the DfT's Transport Direct programme and further LTP funding.

Support Services

Members of the QBP have had to acquire new skills to install, operate and maintain the system. The system supplier has provided the required specialist training.

The system has also required new fleet management procedures to ensure that appropriate vehicles are used on the equipped routes and that the system is updated daily with the necessary data.

Consultation and Communications

The QBP decided that consultation with the public about the project was extremely important for two reasons:

* The disruption to bus stop infrastructure during installation
* Educating the public to use the new services

Consultation was undertaken through a 'Passenger Attitude Survey' and through the local elected councillors. The attitude survey took the form of a before and after survey of passengers' opinions on the equipped routes.

A telephone hotline service has been set up for all bus services in the County as a part of the national 'PTI 2000' (Public Transport Information 2000) initiative and will replace the existing 'Bus Line' telephone service. This service, now operating under the national 'Traveline' banner, aims to provide the public with information on bus times, bus stop locations, journey options, fare information, disabled facilities and information service delays via telephone and the Internet. There are also plans to include a foreign language service.

All of these services will improve the accessibility of bus travel, with the aim of encouraging additional users.

PROGRESS TO DATE AND FUTURE PLANS

Star trak so far is operational on 19 routes in Leicestershire. All the star trak routes have:

* GPS based bus location systems
* VMS signs at bus stops
* SMS information for all stops
* On-board bus next stop indicators
* Traffic signal priority for the late running buses

The central computer and database are based in the Leicester Area Traffic Control (ATC) Centre. Bus priority is also active and monitored via the ATC Control Centre.

Features such as real-time information displays are justified at well-used stops on star trak routes. Buses and routes will be fitted with the star trak technology in phases over a number of years. The current plan is to cover 75% of the passenger services in Central Leicestershire and Loughborough by December 2003, with proposals for more services after that.

All the routes that have been improved with measures including star trak, have seen a significant increase in patronage. For example, the number 7 bus in Loughborough has seen such an increase in usage that the frequency has doubled from 20 to 10 minutes since the introduction of star trak.
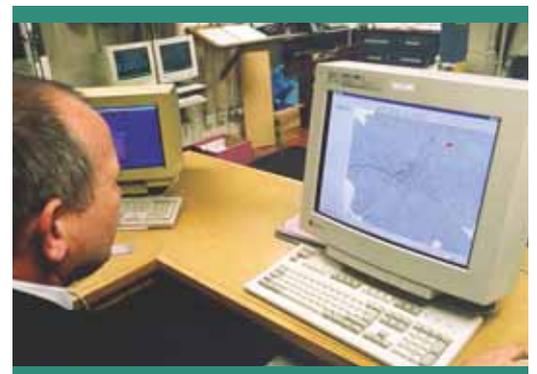
Star Track Central System

IMPORTANT POINTS LEARNED

The star trak system has so far been judged a success, most notably because recent statistics show that all the improved routes have seen an average 28% increase in passengers, and passenger attitude surveys have shown that 90% of users consider the electronic displays either useful or very useful.

The success of the project was largely due to the co-operation of all the bodies involved, working with a common goal.

The QBP first implemented a small initial trial (on three routes) to evaluate the system. Once proved successful, the system was rolled out to other routes in the whole county.

Further Information

For further information visit the star trak web site at:

www.star-trak.co.uk/

CONTACTS

Department for Transport
Traffic Management Division
3/19 Great Minster House
76 Marsham Street
London SW1P 4DR
Tel: 0207 944 2599
Fax: 0207 944 2211
Email: assist-info@dft.gsi.gov.uk
www.its-assist.org.uk

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

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	**Scottish Executive**	**Llywodrath Cynulliad Cymru** **Welsh Assembly Government**
Requests for unpriced TAU publications to: Charging and Local Transport Division, Zone 3/23, Great Minster House 76 Marsham Street, London, SW1P 4DR. Telephone 020 7944 2478 e-mail: tal@dft.gsi.gov.uk	Within Scotland enquiries should be made to: Neil Weston, Scottish Executive, Development Department, Transport Division 3, Zone 2-F, Victoria Quay, Edinburgh, EH6 6QQ, Telephone 0131 244 0847 e-mail: neil.weston@scotland.gsi.gov.uk	Within Wales, enquiries should be made to: Welsh Assembly Government, Transport Directorate, 2nd Floor, Cathays Park, Cardiff, CF10 3NQ Telephone 029 2082 5111 e-mail: cone@wales.gsi.gov.uk

Cycling · Traffic Management · Walking · Bus Priority Systems · Parking · Signs and Signals · Intelligent Transport Systems