



Future Transport in Birmingham:  
**Our Intelligent Transport Systems (ITS) Strategy**



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## Foreword

I am delighted to introduce this draft Strategy which sets a framework for the future development of Intelligent Transport Systems (ITS) in Birmingham. It has been prepared by the City Council's Transportation Strategy team and was informed by input from colleagues in other areas of the City Council and key partners.

ITS is generally described as the integration of information and communications technology with transport infrastructure, vehicles and users. It is a tool for use as part of transport management strategies to provide an integrated, safer, more efficient and more sustainable transport system. Simply, the co-ordinated, well designed use of ITS can help save lives, time and money.

ITS supports the City Council's Vision for Birmingham as set out in the 2007 - 2010 Council Plan. ITS will have an increasingly important role in enabling the City Council to continue improving road safety together with the more economic, efficient and effective management of roads, freight and public transport services.

ITS technology, together with appropriate investment in infrastructure will provide benefits in terms of reduced accidents and congestion and help to make our transport networks more secure. ITS will also provide tools to assist the City Council in meeting its wider environmental objectives

Public Transport users will be able to access live information and be able to use integrated smart card ticketing systems. Motorists will be able to use in-vehicle devices which will inform them about the most efficient and safest route to take to their destination. ITS can enable speed limits to be enforced automatically. Freight operators will be able to make informed decisions on their logistics operations which will enable them to select the most efficient routes and guaranteeing that their consignments remain safe and secure.

There is already ITS deployment in Birmingham. This draft Strategy is intended to open up a much needed dialogue on the role ITS can play in delivering Birmingham's transport policies and wider objectives. The aim of this Strategy is to guide the delivery of new ITS and to ensure that these initiatives deliver benefits to the widest range of policy areas.

In order to achieve this, lateral thinking and partnership working which cuts across organisational boundaries will be necessary. I believe that the development, promotion and ultimately implementation of this ITS strategy by the City Council is an important step to ensuring that we obtain the best value for money from the City Council's significant investment in transport infrastructure.

I urge you to play your part in assisting the development of Birmingham's ITS strategy by responding to the consultation. Your views and your opinions are important.

Councillor Len Gregory  
Cabinet Member for Transportation & Street Services, November 2007

# **1 Birmingham's Intelligent Transport Systems (ITS) Strategy**

## **1.1 Why does Birmingham need an ITS strategy?**

ITS – Intelligent Transport Systems – is the integration of information and communications technology with transport infrastructure, vehicles and users. By sharing vital information, ITS allows people to get more from transport networks, in greater safety and with less impact on the environment.

Birmingham requires an ITS strategy to ensure that the maximum benefits can be gained from implementation of various types of applications thus helping to deliver safer, more secure, more efficient and more sustainable transport.

This Strategy identifies where ITS can play a key role in supporting transport in Birmingham. The Strategy should enable linkages between distinct areas to be made and help identify opportunities for improved joint working within the City Council and with external partners.

ITS uses computer and communication technologies together with real time data from various sources to:

- Collect information about the current state of the transport network;
- Process that information; and

Either directly manage the network or provide information to allow people to decide how best to make a journey.

## 2 Policy Context

### 2.1 European policy

The European Union (EU) White Paper *Transport Policy for 2010*, updated in 2006, stressed the role of intelligent transport systems in meeting the challenge of delivering fast, reliable and safe transport networks across the EU. In addition the EU has published an ITS policy which includes the implementation of Galileo as a new Global Positioning System.

### 2.2 UK policy

The Government has five over-arching objectives for transport:

- a) to protect and enhance the built and natural environment;
- b) to improve safety for all travellers;
- c) to contribute to an efficient economy and support sustainable economic growth in appropriate locations;
- d) to promote accessibility to everyday facilities for all, especially those without a car; and
- e) to promote the integration of all forms of transport and land use planning, leading to a better, more efficient transport system.

The policy context for ITS in the UK is set out in a range of key Government documents produced by both the Department for Transport (DfT) and the Department for Trade and Industry (DTI).

The 2004 **Future of Transport White Paper** sets out the Government's strategy for land transport. It highlights the need for road networks that are enhanced by better management, supported by technology to manage the network and inform travellers.

New technologies offer opportunities to:

- Reduce the risk of accidents
- Support environmental protection objectives
- Improve sustainable freight transport

Elsewhere the importance of developing ITS for the delivery of transport and wider policy objectives is reflected in the DfT's **Road Pricing Feasibility Study**, **Managing Our Roads** and **Tomorrow's Roads – Safer for Everyone: The First Three Year Review**.

The DTI Innovation Report – **Competing in the Global Economy – The Innovation Challenge** – looks at the contribution that ITS can make in supporting UK productivity.

The DfT published a **Policy Framework for the Roads Sector** in November 2005. It sets out the role of ITS in supporting government road transport objectives and that there is a need for collaboration between the public and private sector to realise the potential benefits.

The HM Treasury/DfT commissioned **Eddington Study** published at the end of 2006 exploring the impact, beyond 2015, of transport decisions on the UK's productivity, stability and growth. The report highlights the role of technologies in improving traffic management and meeting environmental objectives.

### **2.3 The Traffic Management Act 2004**

The Traffic Management Act, 2004 (TMA) places new network management duties on local highway authorities. The main duty is to secure the expeditious movement of traffic, inclusive of cyclists and pedestrians, on the authority's road network and on adjacent road networks for which another authority is the traffic authority. Intelligent Transport Systems will play a key role in helping the City Council ensure it meets its responsibilities.

### **2.4 Regional Policy**

The delivery of Intelligent Transport Systems will support the various policies within the **Regional Transport Strategy** as set out in the **West Midlands Regional Spatial Strategy** in various ways including efficiency and knowledge. In particular it has a supporting role for;

- Policy T1 – Developing accessibility and mobility in the region to support the Spatial Strategy
- Policy T2 – Reducing the need to travel
- Policy T4 – Promoting Travel Awareness
- Policy T5 – Public Transport
- Policy T7 – Car Parking Standards and Management
- Policy T8 – Demand Management
- Policy T9 – The Management and Development of National and Regional Transport Networks
- Policy T10 – Freight

## 2.5 West Midlands Local Transport Plan

The second West Midlands Local Transport Plan acknowledges that Intelligent Transport Systems (ITS) will play a major role in meeting the network management duty. The Metropolitan Authorities have a history of involvement with ITS. The Authorities have continued to implement ITS solutions to manage traffic growth. More recently, they have played an important part in the European Research & Technological Development framework programmes and the Urban Traffic Management and Control (UTMC) research programme.

The use of ITS such as UTMC, ITIS and the development of the MATTISSE system to monitor progress in improving network management and operation will be essential in delivering on many of LTP2's objectives and targets. A major scheme bid has been submitted for the West Midlands Urban Traffic Control systems. The bid, if successful, will improve communication and coordination between the seven Metropolitan Urban Traffic Control centres together with the Police, Highways Agency and public transport operators.

## 2.6 City Council Policy

At a City Council level the potential use of technology (transport telematics) to achieve better management of the highway network is highlighted in **Visions** – para 4.9: *'The City Council will actively support the development of new technologies which will help deliver our policies in an efficient, effective manner. It is important that in pursuing this we seek to create linkages with local business to help stimulate the development of an advanced telematics industry in Birmingham'*.

ITS will contribute to delivering the Strategic Outcomes for the Transportation & Street Services portfolio of the 2007-2010 **Council Plan**;

- Succeed Economically  
*Benefiting from education, training, jobs and investment*
- Stay Safe  
*Fewer deaths, injuries and losses from accidents in the city, and safer streets for pedestrians*
- Be Healthy  
*Increased safety on roads and reduced traffic pollution*
- Enjoy a high quality of life  
*Thriving, clean and attractive local centres*
- Make a contribution  
*Improved customer satisfaction; improved safety and mobility for the vulnerable; and local residents getting involved and helping to keep neighbourhoods clean*

## **2.7 Scrutiny Review**

A report by the Transportation & Street Services Overview and Scrutiny Committee in April 2006 examined Traffic Management and Control, as congestion was a key concern amongst residents and is a priority within the Council Plan.

The Review highlighted the value of ITS in making travel more efficient, in terms of its safety, pollution effects, cost and information provision.

The Scrutiny Review recommended that the City Council develop an overall policy for Intelligent Transport Systems given the fluid nature of the issue and the ongoing changes happening at all levels.



### **3 Birmingham's ITS strategy**

As previously mentioned the Department for Transport published their Policy framework for the roads sector in November 2005 from which the various policy themes are taken. This document sets out the seven policy themes with actions where ITS applications can play an important role for transport and travellers.

The seven policy themes:

- Improving Traffic Flow
- Improving Road Safety
- Improving Traveller Information
- Improving Public Transport
- Improving Freight Efficiency
- Improving the Environment
- Improving Security and reducing Crime

The use of ITS tools and technology will assist the City Council in meeting its local transport objectives and carrying out its network management duties under the Traffic Management Act 2004.

Each of the above themes is explored from a Birmingham perspective and considers the issues and opportunities for the City Council with regard to ITS and suggested policies and actions for supporting their use in Birmingham. Appendix 1 provides a glossary of terms.

#### **3.1 Improving Traffic Flow**

Congestion is an increasing problem in Birmingham and elsewhere in the UK. Generally Birmingham's roads function well for much of the time. However, delays do occur either as a result of traffic volume compared with capacity, road works or incidents such as accidents.

A variety of ITS systems are already being used to assist road network management in Birmingham in terms of both monitoring and control traffic flow.

##### **3.1.1 Signalised junction control;**

Half of the City's 1,000 signal junctions and pedestrianised crossings are controlled by the UTC centre including junction six of the M42. Others are linked via MOVA or cableless linking. This number is continuing to increase with the most recent event being new sites added as part of the new Northfield Relief Road and the remodelled St Chads interchange,.

Linking signals through the UTC is important because it allows for monitoring and control at a central point providing quicker warnings that a

problem has developed. Traffic signal improvements are important in order to increase efficiency in traffic detection and control across the City.

### **3.1.2 Monitoring Flows**

This is through outstations such as loop detection or in vehicle links such as ITIS or Traffic Master networks. It can provide realtime information (e.g. ASTRID through SCOOT network) or historic information.

### **3.1.3 CCTV cameras**

CCTV cameras are the eyes of the UTC and allow staff to monitor the network and see where and why a problem is occurring. The UTC currently has 17 permanent traffic CCTV cameras at key junctions across the City.

The UTC has recently gained access to CCTV cameras from the neighbouring control room which are generally used for other purposes. About 40 of the 400 cameras are useful to the UTC. This level of coverage for a City the size of Birmingham is inadequate and further expansion is planned.

The Scrutiny Review of Traffic Management and Control recommended that CCTV coverage to the UTC could be expanded by linking the UTC with other systems and by identifying where developer contributions could be used for new infrastructure.

In order to improve co-ordination the Police and information networks can be given direct access to the UTC and Control Room cameras.

### **3.1.4 Variable Message Signs (VMS)**

Currently the UTC manages two VMS signs (Aston Expressway and A38 Bristol Road). VMS signs are useful as they enable drivers to be informed of any current problems on the network or advised in advance of events/incidents that could cause disruption.

### **3.1.5 Car Parking Systems**

Car Parking systems are similar to VMS as they provide advance information to drivers about the availability of car parking spaces. Currently two systems operate covering six car parks. Ideally the system will be expanded to cover most if not all car parks in the city centre.

Currently the UTC does not operate on a 24/7 basis. This will change shortly when the Regional Control Centre takes on out of hours management of Birmingham's UTC.

### **3.1.6 Urban Traffic Management and Control (UTMC)**

UTMC will be an important next step for the development of UTC in Birmingham. UTMC will allow Birmingham's UTC to join with the systems of the Police, Highways Agency and public transport operators. This enables information to be shared more quickly and efficiently.

The DfT created the Urban Traffic Management and Control Framework to establish technical standards to ensure the compatibility of various systems. The UTMC concept forms the UK framework for the development and deployment of ITS in urban areas and will give greater flexibility to tailor control and meet the needs of different areas, (See Appendix 2 for more detail)

### **3.1.7 Communications Infrastructure**

One of the issues which has prevented the expansion of ITS networks in the past has been the cost of the communication links which have historically been fixed connections from BT. New technologies and the UTMC specifications will allow digital communication techniques to be used including GPRS or wireless.

Birmingham is involved in a number of important initiatives:

### **3.1.8 Co-ordination**

Together with the other six West Midland Metropolitan authorities Birmingham is taking part in the development of the Road Information Framework (RIF) which draws on Highways Agency (HA), Local Highway Authority's (LHA's) and Department for Transport (DfT) data sources to provide information that contributes to the more effective management of the strategic and local road network. Birmingham will need to exploit the benefits of the RIF project with key partners.

### **3.1.9 Demand Management**

ITS technology can be used to identify vehicles which can be used in different forms of demand management such as road space reallocation, priority vehicle lanes or congestion charging/road user charging.

### **3.1.10 Emergency Planning**

ITS has an important role in supporting how the City Council and other authorities respond to and manage emergencies and incidents for example incidents such as the tornado, the city centre evacuation on 9<sup>th</sup> July 2005 or road accidents and burst water mains. Clearly the transport implications are one of a number of important considerations as part of an Emergency Plan.

### 3.1.11 BCC Roles and Opportunities

ITS can assist in responding to incidents for example CCTV coverage can allow them to be monitored while the emergency services are en route as well as being able to direct them efficiently to the location where they are required. The ability to control traffic signals remotely provides the opportunity to provide priority for the emergency services e.g. by creating a clear route by giving priority at signals – ‘Green Wave.’

Partnership working using ITS with the various stakeholders enables the City Council to collect info and disseminate to a range of customers (including the public, emergency services and transport operators) via a range of channels such as by public information sources, road side signs, telephone or mobile devices, radio, television, or websites such as:

The availability of a 24 hour UTC operation, due to begin soon, and UTMC will provide the ability to co-ordinate out of hours incidents, such as the evacuation of the city centre in July 2005.

It is important to ensure integrity of resilience of ITS infrastructure to ensure data protection and privacy but also to prevent systems failing through malicious tampering or other damage.

### 3.1.12 Suggested Policies and Actions

Policies	Action and Timescales
<p><i>To exploit ITS technologies to improve network efficiency.</i></p> <p><i>To use technologies to give priority to types of vehicles or users where appropriate.</i></p> <p><i>To work with partners on access to systems and networks for the benefit of network efficiency and operation</i></p> <p><i>Establish a UTMC system for Birmingham to further the City Councils objectives.</i></p>	
<p><b>Actions</b></p> <p>It is important that the City Council capitalises on the existing UTC system investments. The Validation and input modelling of the existing SCOOT system can provide further benefits by optimising the operation of signal controlled junctions.</p> <p>The City Council will explore the expansion of car park management system and VMS signs</p>	<p>BCC                      Ongoing</p> <p>BCC/Private Operators    2011</p>

<p>Establish the use of the Regional Control Centre (RCC) for out of hours traffic management</p> <p>Expansion of use of CCTVs to deal with local traffic congestion and enforcement (e.g. deployment of Automatic Number Plate Recognition (ANPR) technologies)</p> <p>Exploit the benefits of the Road Information Framework project with key partners</p> <p>Ensure ITS equipment used are in compliance with the industry UTMC standards</p>	<p>BCC/Other authorities/HA 2011</p> <p>BCC/Police 2009</p> <p>BCC/HA/Operators/Media By 2010</p> <p>BCC Ongoing</p>
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### 3.2 Improving Road Safety

Birmingham, together with the other six West Midlands Metropolitan Authorities, has adopted challenging road casualty reduction targets as part of the second Local Transport Plan.

**Table 1 – (West Midlands LTP2)**

West Midlands Road Casualty Reduction Targets for 2010		
Targets or Outcomes	Baseline Data and Target Figure	Contributory measures
<b>All Casualties:</b> 40% reduction in all KSIs from the 1994-98 average to 2010, and a 30% reduction from 2004 to 2010	1994-98 average: 2093	Increased expenditure on road safety schemes and initiatives through block grant, Red Routes, targeted area initiatives.
	2010 target: 1151	
<b>Child Casualties:</b> 50% reduction in child KSIs from the 1994-98 average to 2010, and a 35% reduction between the 2002-4 average and the 2008-10 average	2004 total: 1149	
	2010 target: 804	
<b>Slight Casualties:</b> 10% reduction in slight casualties from 2004 to 2010	1994-98 average: 415	
	2010 target: 208	
	2002-4 average: 216	
	2008-10 target: 151	
	2004 total: 10,665	
	2010 target: 9599	

**ITS contributes to improving road safety in a number of ways:**

#### 3.2.1 Enforcement

Cameras are used for a variety of purposes:

- Speed cameras
- Red-Light cameras
- Time and distance cameras
- Automatic Number Plate Recognition (ANPR) cameras

Current and future provision of Speed cameras and Red-Light cameras are the responsibility of the West Midlands Safety Camera Partnership. These are funded via the Specific Road Safety Grant from central Government.

There are currently no ANPR or Time and Distance cameras in Birmingham. ANPR cameras are to be introduced by the West Midlands Police around the City Centre. Time and distance cameras are used elsewhere in the UK, mainly by the Highways Agency, to control speed, particularly in roadworks. They also offer the ability to monitor journey

times. The Police have aspirations for the use of ANPR cameras around Birmingham City Centre for vehicle monitoring purposes. The technology could be used to assist with the additional enforcement responsibilities which are likely to affect Birmingham (i.e. moving traffic offences – use of bus lanes etc) as a result of Part 6 of the Traffic Management Act 2004.

### 3.2.2 CCTV cameras

Are used for monitoring sites where concerns about road safety have been raised and can be used to modify behaviour.

### 3.2.3 Intelligent Traffic Signals

Modern traffic signals incorporate technology to help improve pedestrian safety. Toucan and Puffin crossings use sensors to modify crossing times to take account of pedestrian flows. The City Council has raised safety concerns with Puffin Crossings as they can cause confusion to users more familiar with Pelican and Toucan crossings which still use far side pedestrian signals.

### 3.2.4 Information for drivers

**Variable Message Signs** can be used to advise drivers of adverse weather conditions or hazards and other potential problems as well as providing route guidance.

**Speed activated signs** can be used to reinforce speed limits to warn drivers to adhere to speed limits. In addition specific message signs such as those to advise of school crossing controls can also be used.

### 3.2.5 Education

Web sites can provide a valuable resource for information and education on road safety issues e.g. [www.wmsafetycameras.co.uk](http://www.wmsafetycameras.co.uk)

### 3.2.6 Traffic Management and Control

**Active Traffic Management (ATM)**, such as the Highways Agency's scheme on the M42 which uses mandatory speed limits and hard shoulder running in response to traffic conditions, is being increasingly viewed as an approach to providing additional capacity and improving road conditions including safety. The early results of the M42 scheme seem positive with up to 35% improvement in journey reliability but a full review will not be complete until 2008. The HA are already planning to extend ATM to the remainder of the Midlands motorway network. The tidal flow system used on the A38 (M) Aston Expressway is in essence a form of ATM.

### 3.2.7 Intelligent Speed Adaptation (ISA)

Technologies are being developed to allow elements of vehicle control to be managed by the vehicle either as a result of driver choice or due to enforcement e.g. vehicle speed restricted in response to speed limits. In addition the use of on-street sensors to activate traffic signals to turn to red when a speeding vehicle approaches.

### 3.2.8 Suggested Policies & Actions

Policy	Action and Timescales	
<p><i>The City Council should continue to explore new opportunities that new ITS technologies offer for improving road safety.</i></p>		
<p><b>Actions</b></p>		
<p>To develop targeted use of cameras to improve road safety due excessive speed or failure to comply</p>	BCC/Police	2012
<p>To expand the use of activated signs at sites where there would be a cost effective safety benefit</p>	BCC/HA	2012



### **3.3 Improving Traveller Information**

It is important that information is available in an easily accessible medium so that it enables people to make informed choices about when and how to travel. ITS systems offer the opportunity to collect and distribute accurate and reliable real time information.

Generally information can be defined in two groups:

- Pre journey and;
- In journey

#### **3.3.1 Pre journey**

Pre journey information has traditionally been available via TV (Ceefax etc) and radio. The internet has enabled much more up to date information to be made available and allows the users to tailor their information requirements.

There are a number of sources of pre journey information available to travellers in the West Midlands:

#### **3.3.2 MATTISSE**

MATTISSE is a regional traffic monitoring and traveller information system. It shares information between the MATTISSE Consortium:

- The seven West Midlands Local Authorities;
- Leicester City Council;
- West Midlands Police;
- Central Motorway Police Group;
- Public Transport Operators;
- The Highways Agency; and
- Information providers

MATTISSE draws data from existing systems such as UTC and public transport Real Time Information together with manual inputs. The information is made available through:

- Internet - [www.help2travel.co.uk](http://www.help2travel.co.uk)
- Kiosks in the Bull Ring
- Mobile phones
- Public Space Large Screen Displays (e.g. at Hospitals and Centro ticket offices)

There are still a number of opportunities which the system can provide such as historic congestion data and live data relating to roadworks. These are being addressed through the 5 Year Strategy which is being managed by TELENT on behalf of the MATTISSE consortium.

### 3.3.3 Local Information

Birmingham City Council manages the Community Travelwise website ([www.communitytravelwise.org.uk](http://www.communitytravelwise.org.uk)) which taps into all the travel information currently available online (including real time information and journey planning software), but enables each group to tailor their web pages specific to their own community venue.

In addition the City Council proposes additional sites for Residential Travelwise ([www.residentialtravelwise.org.uk](http://www.residentialtravelwise.org.uk) (not yet active)) and School Travelwise ([www.schooltravelwise.org.uk](http://www.schooltravelwise.org.uk) (not yet active)).

There is also travel information on the City council's website; [www.birmingham.gov.uk](http://www.birmingham.gov.uk)

Centro also has two sites:

[www.centro.org.uk](http://www.centro.org.uk) and;

Network West Midlands – [www.networkwestmidlands.co.uk](http://www.networkwestmidlands.co.uk);

Both offer information on public transport modes within the Centro/Network West Midlands area. There is also the Travelinemidlands website ([www.travelinemidlands.co.uk](http://www.travelinemidlands.co.uk)) which offers journey planning and information.

National Rail and other public transport operators also have their own websites;

In addition Transport direct ([www.transportdirect.info](http://www.transportdirect.info)) is being developed by central Government. The vision for Transport Direct is to provide a comprehensive, easy to use multi-modal travel information and ticketing service.

The vast range of websites which are available could potentially create confusion for users. Help2Travel could be promoted as a local portal for access to journey planning and traffic information.

On-street electronic information kiosks can provide useful sources of information on a variety of issues including travel options.

Bus and train information is available on mobile phones via the SMS text messaging service. This information is available both pre and in journey.

The Digital Birmingham initiative will provide opportunities to make travel and parking information available via Wi-Fi.

### 3.3.4 In-journey information

In journey information is becoming increasingly accessible via a number of channels using global positioning information for realtime or static use – TMC, RDS.

### 3.3.5 Local Information

Currently the Birmingham's UTC provides traffic information to Trafficlink who provide the information for **TV and radio** bulletins.

**Variable Message Signs** at the roadside offer the ability to provide real-time, visual messages to advise of potential problems. Currently the City operates two. It is an aspiration that these will eventually be on all radial routes.

**Display Screens** in workplaces, hospitals etc (a number have recently been provided at various locations as part of the MATTISSE/help2travel programme) can be valuable in providing information.

Information generated by the City Council and other sources can be used by **Sat-Nav** system providers to provide real-time in vehicle information to people travelling by car.

### 3.3.6 Suggested Policies and Actions

Policy	Action and Timescales
<p><i>The City Council supports and promotes the availability of accurate pre and in journey travel information via a range of channels</i></p>	
<p><b>Actions</b></p>	
<p>Help2Travel should be promoted as a local portal for journey planning and traffic information linking to other relevant websites</p>	<p>BCC/Other authorities/Telent Ongoing</p>
<p>The City Council will continue to improve the data it provides (particularly if UTMC is developed) and where appropriate provide additional services to provide information (e.g. Variable Message Signs)</p>	<p>BCC Ongoing</p>
<p>Provision of online MATTISSE data direct to the staff who deal with road works.</p>	<p>BCC/Other authorities/Telent Ongoing</p>
<p>Working with TELENT to increase the use and availability of data on MATTISSE and develop and implement the appropriate work packages.</p>	<p>BCC/Other authorities/Telent Ongoing</p>
<p>Work with Digital Birmingham in providing travel information via Wi-Fi</p>	<p>BCC/Digital Birmingham Ongoing</p>
<p>Work with TELENT and key partners to develop and implement the work packages in the MATTISSE project</p>	<p>BCC/Other authorities/Telent Ongoing</p>

### **3.4 Improving Public Transport**

There were 315 million bus journeys in the West Midlands in 2004/05. However, the level of patronage continues to decline. Bus services suffer from congestion on Birmingham's highways. ITS offer a range of supporting measures which can support bus services.

The use of ITS can support the following Local Transport Plan targets for bus use:

- Improve percentage of users satisfied with local bus services from a 2001 baseline of 61.5% to 75% by 2011.
- On routes where buses run at least every 10 minutes, no more than 5% of service intervals should exceed 1.5 times the published service interval by 2011.
- Improve morning peak (08:00 – 09:00) bus speeds relative to private car speeds on completed Bus Showcase corridors.

#### **3.4.1 Selective Vehicle Detection**

As highway authority the City Council is responsible for physical infrastructure measures. At a number of signalised locations across Birmingham buses have priority due to Selective Vehicle Detection (SVD). SVD will be incorporated into Showcase schemes which are developed.

#### **3.4.2 Bus Lane Enforcement**

Automated dedicated lane enforcement is being tested in Birmingham with a trial in Digbeth using CCTV. It is intended will lead to camera enforcement of bus lanes in Birmingham to meet the duties as highway authority arising from the Traffic Management Act 2004. Other moving traffic or parking offences will also be enforceable using cameras as the Act's regulations are introduced.

#### **3.4.3 Real Time Passenger Information**

Real Time Passenger Information (RTPI) is available on a number of routes across Birmingham and provides both waiting time information at stops together with live journey information via websites (e.g. help2travel) or SMS text messages. Half of Travel West Midlands' fleet is now equipped with RTI and Centro would like to see other operators equipped. Real Time information is also being rolled out to Park & Ride sites at railway stations.

#### **3.4.4 Automatic Vehicle Location**

Primarily a tool for operators to assist with fleet management but the information could be used by the City Council to provide additional

information with regard to traffic conditions and assist in developing strategies for implementing further bus priority measures.

### 3.4.5 Suggested Policies & Actions

Policy	Action and Timescales	
<p><i>The City Council should continue to support the use of ITS to deliver local bus and rail use targets and other measures for increasing levels of public transport and passenger satisfaction.</i></p>		
<p><b>Actions</b></p>		
<p>Deliver priority vehicle measures to assist reliability of public transport</p>	BCC/Operators	2008
<p>Extend camera enforcement to moving traffic offences initially</p>	BCC	2015
<p>Provide real time information at public transport interchanges</p>	Centro/Operators	2008

### **3.5 Improving Freight Efficiency**

Freight movement is an essential element in the national, regional and local economies. In 2005 104 million tonnes of road freight was generated within the West Midlands region with 68 million tonnes destined outside the West Midlands. 71 million tonnes of goods was received from the rest of the United Kingdom (DfT Regional Transport Statistics 2006 Edition November Table 7.2 p.104). Taking into account through traffic to the rest of the UK and international hauliers (2.02 million vehicles – including UK registered – destined to mainland Europe from the UK in 2005) the tonnage of freight carried on West Midlands roads each year is above 243 million tonnes (DfT Transport Statistics Great Britain 2006 Edition Table 4.11 p71).

ITS can help the freight industry to utilise road conditions more efficiently and environmentally sustainably. Efficiency in road freight logistics can be supported via in-vehicle systems that offer route guidance and scheduling tools that enable better fleet and driver management. Satellite tracking is also being increasingly used.

#### **3.5.1 West Midlands Regional Freight Strategy**

The City Council leads the West Midlands and the Regional Freight Advisory Group (WMFQP and RFAG respectively.) Both the WMFQP and RFAG will be working closely with the West Midlands Regional Assembly who published the WM Regional Freight Strategy (RFS) earlier in 2007. The RFAG will be monitoring and delivering the RFS Action Plans for Road, Rail, Air, Pipelines and Inland Waterway Freight.

#### **3.5.2 Internet Publishing of the Printed 2005 Freight Atlas**

The City Council as a member of the WMFQP is hoping to provide the West Midlands Commercial Drivers Road Atlas as an online resource for the Freight Industry which would give information on bridge heights, width and weight restrictions and parking restrictions. It is hoped that this will help all Birmingham, West Midlands, UK and international drivers choose the most efficient route thus reducing physical impacts, fuel costs, time delays, congestion and pollution. It may also be possible to deliver this information via mobile devices such as Sat-Nav. The driver could be able to input the type of vehicle that they are driving and the destination so they can be advised of most appropriate route.

#### **3.5.3 CCTV**

The recent introduction of driver's hours restrictions which require drivers to take more frequent breaks, increases in lorry theft and curfew impositions has highlighted the lack of (secure) lorry parking facilities in Birmingham. The provision of CCTV can help to increase the number of safe places to park and reduce the threat of theft from lorries.

### 3.5.4 Suggested Polices and Actions

<b>Policy</b>	<b>Action and Timescales</b>
<p><i>The City Council should continue to promote and enhance the provision of ITS systems and online information to assist the freight industry.</i></p> <p><i>The City Council should continue to promote and support ITS initiatives to enhance efficiency in partnership with operators.</i></p>	
<b>Actions</b>	
<p>As part of the West Midlands Freight Quality Partnership, the City Council should explore opportunities for developing an online version of the West Midlands Commercial Driver's Road Atlas and Satellite-Navigation products.</p>	BCC/Operators/Partners 2010
<p>MATTISSE/help2travel should be developed to assist efficient freight movement</p>	BCC/Operators/Partners 2010



## **3.6 Improving the Environment**

**3.6.1** The use of ITS techniques can provide significant opportunities to reduce the environmental burden of transport networks, notably through:

- Improved vehicle technology which reduces exhaust emissions (more efficient engines so more miles per gallon and less CO<sub>2</sub> emissions, fewer emissions which cause air quality concerns)
- Enabling more efficient use of road space, thus reducing congestion and associated exhaust emissions
- Traffic light management which optimises for local air quality (this facility is available for use now but has not been explored - it could prove particularly beneficial where buses and/or HGVs frequently have to queue uphill at traffic lights)
- Smoothing traffic flow thereby reducing high levels of exhaust emissions caused by stop-start driving techniques and can reduce noise.
- Improved vehicle route planning (pre-journey and in transit) leading to less miles being travelled and congestion hot-spots being avoided
- Reducing traffic levels by providing smooth and efficient public transport alternatives and/or by providing good online journey planning and/or incentives to travel by more environmentally friendly modes.

### **3.6.2 BCC issues and opportunities**

From a City Council perspective it is important to ensure that ITS applications current and future are used to help minimise the impact of transport on the environment – i.e. both physical and climate.

ITS can contribute positively to both air quality and wider environment sustainability objectives. For example: Variable Messaging Signs and car park management systems can improve journey reliability and reduce delays and hopefully decrease emissions etc.

The use of SCOOT at signalised junctions can also be used by the UTC to ensure that vehicle emissions are reduced by smoothing traffic flows.

ITS technologies which support more efficient use of the existing road infrastructure or can encourage the use of non-car modes can reduce the need for additional infrastructure.

### 3.6.3 Suggested Policies and Actions

<p><b>Policy</b></p> <p><i>To ensure the environmental impacts of using ITS technologies are considered when developing programmes.</i></p> <p><b>Actions</b></p> <p>The City Council will develop an Environmental and Social Impact checklist (A draft is attached at Appendix 3) which can highlight both positive and negative effects of ITS implantation which can be used as an environmental impact assessment for ITS.</p>	<p>Action and Timescales</p> <p>BCC 2008</p>
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### **3.7 Improving Security and Reducing Crime**

Security is a major factor in transport systems and infrastructure and will continue to be so for the foreseeable future. Security includes the perception or risk of personal injury and theft, damage to or theft of vehicles, Security issues may arise:

- On the road itself
- In service areas, car parks etc
- At signals or junctions
- At bus stops, bus and railway stations and interchanges
- At Coach and Lorry Parks
- At Freight Depots

ITS systems can enhance the safety and security of the City's transport networks.

#### **3.7.1 CCTV**

A positive perception and the use of public transport can be supported through the use of CCTV technology to enhance passenger safety at bus stops and railway stations, on board buses and trains.

The City Council has access to a large number of CCTV cameras. Some are dedicated traffic cameras and others are used for a variety of purposes. The UTC now has access to feeds from the neighbouring control room for traffic purposes.

The Birmingham Community Safety Partnership supports the use of CCTV to improve passenger safety and highlights this in its Strategy for 2005 - 2008. The Strategy recognises the need for the Partnership to maintain co-ordination of CCTV through the appointment of a CCTV co-ordinator together with a cross Birmingham, multi-agency CCTV co-ordination group. The need for co-ordination of CCTV implementation and use was also highlighted in the City Council's Scrutiny Review of CCTV in Birmingham published in February 2005.

#### **3.7.2 Car Parks**

CCTV can be used to enhance safety and reduce the fear of crime in car parks particularly by using CCTV cameras that are able to tilt, zoom in on particular individuals and pan around the surrounding area. The City Council is currently undertaking a programme of car park refurbishments. As part of the programme CCTV monitoring will be improved. CCTV is important in ensuring the security of car, coach and lorry parking areas.

### **3.7.3 Automatic Number Plate Recognition**

Automatic Number Plate Recognition (ANPR) cameras could be of benefit to the City Council in terms of journey time monitoring as well as enforcement. The Police could also use ANPR to check on vehicles e.g. entering and leaving the City Centre (the so called 'Ring of Deterrent'). In addition the Transport Act 2000 provides powers for local authorities outside of London to take on from the Police the enforcement of bus lanes and other moving traffic offences.

Approval was given in December 2003 for the implementation of the Digbeth CCTV Bus Lane Enforcement scheme, to be carried out on a trial evaluation basis. The proposed Bus Lane Camera Enforcement Scheme applies to Digbeth bus priority lanes which run from St Martins Church (the old Bull Ring area) to Camp Hill Circus and involves the use of CCTV cameras to detect "driving in Bus Lane" offences.

Further feasibility work is being undertaken in order to develop a programme of bus lane enforcement in Birmingham in order to meet the Council's duties as Highway Authority under the Traffic Management Act 2004.

### **3.7.4 Emergency Help Points**

There are 6 help points for visitors in the city centre. When these are activated CCTV focuses on the area and the unit is connected to an operator in the control room.

### **3.7.5 Public Transport**

Centro uses CCTV to monitor bus stations, and railways stations with their associated car parks. Centro has a contract with the City Council's control room which monitors the majority of its cameras.

In addition Centro has 23 bus shelters that are covered by CCTV. This has been a result of where repeated vandalism has taken place in the past.

Travel West Midlands have CCTV on all of their services to deter crime. The cameras record footage which can be used as evidence in the event of an incident. Some of the services have plasma screens which relay the footage to reinforce the message that the CCTV is live. Images from the buses are managed by a team of eleven staff. This is funded by Travel West Midlands.

### 3.7.6 Suggested Policies and Actions

Policy	Action and Timescales	
<p><i>Birmingham City Council supports the use of ITS applications on public transport to reduce crime and its perception and support the use of public transport</i></p> <p><i>To use ITS applications to enhance the confidence of the public in transport systems and services</i></p>		
<b>Actions</b>		
<p>Ensure that CCTV installations are co-ordinated with other improvements such as lighting. CCTV is not in itself a solution and should be integrated into a package of security measures</p>	BCC/Partners	Ongoing
<p>Contribute to a CCTV co-ordination group to ensure and City Council CCTV initiatives are communicated to other stakeholders who may have an interest.</p>	BCC/Partners	Ongoing

## **4 Framework for Change**

### **4.1 New ITS implementation**

- 4.1.1 There has already been a considerable amount of investment in ITS in Birmingham over recent years and it will not be an option to provide new equipment in one go. Instead it will be necessary to build on and develop the existing infrastructure incrementally so that the benefits identified in this report can be realised.
- 4.1.2 In advance of funding to develop UTMC all new applications or the extension of existing applications should meet UTMC standards. Existing systems will be integrated and upgraded to UTMC in a phased manner as they are renewed or as required. Initially, many of the advantages of UTMC can be achieved by upgrading and integrating the central systems and the communications networks.
- 4.1.3 An open framework approach to ITS allows their implementation in a modular approach. This will enable new installations at different locations across the City depending on the specific requirements at the time.
- 4.1.4 Some ITS implementation may require traffic modelling and design work in order to allow the details of the scheme to be developed and a business case prepared. Modelling of the road network may be needed to inform the design of the control and monitoring infrastructure and to help evolve operational strategies for managing the network using the ITS measures that are put in place.
- 4.1.5 The process of further developing this ITS strategy and any associated programme should make use of the advice and recommendations available from DfT, ITS Assist and the Highways Agency.
- 4.1.6 Together with the six other West Midlands Met Authorities the City Council has submitted a joint Local Transport Plan bid to the DfT for £26 million to fund the development of UTMC. It is hoped that the outcome of this bid will be known later in 2007

### **4.2 Performance Monitoring**

- 4.2.1 ITS need to be monitored to ensure that the day to day operation of the systems is optimised and to ensure that they are delivering the expected benefits. The indicators are likely to vary depending on the systems introduced.

<b>Actions</b>	Action and Timescales
Specific ITS impacts should be included within the Council's monitoring of network performance	BCC

### **4.3 Operation, Maintenance and Management**

- 4.3.1 It will be important to ensure that equipment is maintained and managed effectively and that the fault management regimes are suitable to ensure that when things go wrong, downtime is kept to a minimum.
- 4.3.2 It is necessary to ensure that the systems continue to be operated by suitably qualified staff who can make the necessary decisions and take action to manage traffic flows and collect and provide information effectively.
- 4.3.3 The risks of not ensuring appropriate operation and maintenance are that systems may not operate effectively and fail to produce the benefits for which they were intended. In addition they could provide or display incorrect information which will cause users to lose confidence in them and this will lead to a loss of their credibility and overall effectiveness. The integrity and resilience of the systems must be such that malicious tampering and damage is prevented to ensure data protection and minimise downtime.

### **4.4 Data Protection**

- 4.4.1 Data collected from the use of ITS systems can provide very accurate and useful information about individual and vehicle movements. However, there are issues regarding the availability and sharing of such information and the City Council will need to ensure that it acts appropriately when collecting and sharing information.

## **5 Consultation**

This draft strategy has been prepared by Birmingham City Council to help guide the future development of Intelligent Transport Systems. Prior to its adoption, comments would be welcomed from stakeholders and interested parties on aspects of the strategy. A questionnaire is included to enable an early response. It is available on line [www.birmingham.gov.uk/futuretravel](http://www.birmingham.gov.uk/futuretravel)

## **Appendices**

### **Appendix 1 – Glossary**

### **Appendix 2 – UTMC**

### **Appendix 3 – Draft ITS Environmental Impact Checklist**

## **APPENDIX 1**

## **Glossary of Terms**

ANPR	Automatic Number Plate Recognition
ASTRID	Automatic SCOOT Traffic Information Database
ATM	Active Traffic Management
CCTV	Closed Circuit Television
CO2	Carbon Dioxide
DfT	Department for Transport
DTI	Department for Trade and Industry
EU	European Union
HA	Highways Agency
ISA	Intelligent Speed Adaptation
ITIS	Integrated Transport Information Systems (Company Name)
ITS	Intelligent Transport Systems
KSI	Killed or Seriously Injured
LHA	Local Highway Authority
LTP	Local Transport Plan
MATTISSE	Midlands Advanced Transport and Telematics Information System for Strategies in Europe
MOVA	Microprocessor Optimised Vehicle Actuation - is an adaptive traffic signal control system
RCC	Regional Control Centre
RDS	Radio Data System
RFAG	Regional Freight Advisory Group
RIF	Road Information Framework
RSS	Regional Spatial Strategy
RTPI	Real Time Passenger Information



Sat-Nav	Satellite Navigation
SCOOT	Split Cycle Offset Optimisation Technique
SMS	Short Message Service
SVD	Selective Vehicle Detection
TMA 2004	Traffic Management Act 2004
TMC	Traffic Message Channel
UTC	Urban Traffic Control
UTMC	Urban Traffic Management & Control
VMS	Variable Message Signs
Wi-Fi	Wireless Fidelity
WMFQP	West Midlands Freight Quality Partnership

## **Appendix 2 - Urban Traffic Management and Control (UTMC)**

UTMC will be an important next step for the development of UTC in Birmingham. UTMC will allow Birmingham's UTC to join with the systems of the Police, Highways Agency and public transport operators. This enables information to be shared more quickly and efficiently.

The DfT created the Urban Traffic Management and Control Framework to establish technical standards to ensure the compatibility of various systems. The UTMC concept forms the UK framework for the development and deployment of ITS in urban areas.

### **The UTMC concept has been specifically developed to:**

- create modular systems which are capable of expansion and interoperation with other systems;
- build on and integrate existing systems; increase competition in system supply, expansion and operation;
- maximise the flexibility to meet evolving needs to and introduce new technology;
- provide quality information and the means to use this information, particularly to influence travellers;
- provide a means to move from existing systems to UTMC systems.

The ability to integrate different ITS systems greatly increases their effectiveness by ensuring there is a rapid and reliable flow of information. Birmingham's ITS systems have been introduced incrementally over time but integration has often not occurred making it more difficult to exchange information between organisations.

### **The benefits of UTMC are:**

- Better co-ordination of wide area strategies
- Lower equipment and operations costs
- Better communication between organisations
- New and more accessible services for users

The UTMC approach allows integration of existing traffic management tools and provides a simple structure for others to be easily added. The key is a Common Database or Data Management Facility which receives data from all the different systems, pools the relevant information and sends outputs to the appropriate systems or person.



**Figure 1 – UTMC framework (Source: UTMC Directory of Case Studies)**

The UTMC integrated approach offers the following advantages:

- a more accurate picture of network conditions can be created by combining information from different sources
- incidents and breakdowns can be identified more quickly and easily
- strategies can be developed to deal with recurrent congestion at specific locations
- consistent information is provided to operators and the public
- different organisations (e.g. BCC, HA, Police) can exchange data more efficiently
- transport authorities can work together better to improve traffic flow
- equipment from different suppliers will be compatible

A Local Transport Plan Major Scheme proposal has been submitted to the Department for Transport. It is hoped that a decision will be made later in 2007.

### Appendix 3 – Environmental and Social Impact Checklist for ITS schemes

This checklist can also be used as a basis for developing a monitoring programme if a scheme goes ahead.

Item	Question	Reason for question
1	Is this likely to change the overall level of greenhouse gas emissions from traffic? - in practice this is equivalent to 'Is this likely to cause a change in the amount of fossil fuel being used by vehicles?' (need to think about both driving patterns and traffic levels, including likely levels of induced demand).	To preserve a habitable planet – there are international, national, regional and local commitments to reduce greenhouse gases and CO <sub>2</sub> in particular. See the IPCC web-site, the Stern Review and Birmingham's Climate Change Strategy (public consultation on this document in early 2007).
2	Is this likely to change levels of traffic fumes in areas where people live and work and in particular in places where traffic fumes are already of concern – e.g. Bristol Road through Selly Oak? – also consider in particular large diesel vehicles and older cars with stop-start driving on uphill sections of road.	Exhaust emissions, from all vehicles except electric and hydrogen fuel-cell vehicles, contain Nitrogen Monoxide (NO) and other pollutants. NO further reacts in the atmosphere to create NO <sub>2</sub> and, in certain circumstances, O <sub>3</sub> (ozone); these latter 2 gases are damaging to human health, in addition (tropospheric) ozone is a greenhouse gas (see 1 above). Exhaust emissions from diesel engines contain particulate matter, which can cause respiratory and cardiovascular problems (and have a short term 'global warming' impact). European emissions standards have progressively tightened permitted emission levels in new vehicles however levels from current models of large diesel vehicles remain a concern. Inline with the national Air Quality Strategy, the whole of Birmingham has been declared an Air Quality Management Area for both NO <sub>2</sub> and particulate matter (specifically matter under 10 micron diameter known as PM10s). The associated Air Quality Action Plan seeks to reduce levels of these pollutants.
3	Will resultant infrastructure changes impact on levels of street 'clutter' and/or amount of green space or other public space? Will changes involve destruction of historic buildings or enhance or diminish "sense of place"? Will local biodiversity be affected?	This is primarily a quality of life issue, with repercussions on pride in where people live, feelings of alienation, graffiti and litter offences etc. This is recognised by Birmingham City Council and embraced in its 'Cleaner, Greener and Safer' agenda and in the Council Plan 2007. The Government White Paper "The Future of Transport" 2004 states that: <i>"Good quality transport infrastructure should complement or enhance the character of its local area ... Transport schemes, such as bypasses round towns and villages, should improve the quality of life for local communities but need to be designed in ways that offer environmental gains, reduce community severance and improve air quality wherever possible."</i>

4	<p>Can the environmental and social impacts to produce, transport, commission, maintain, remove and dispose of all the necessary equipment be justified taking into account the likely useful life-time of the equipment? Can these impacts be reduced? – consider on-street equipment, control room equipment and in-car equipment.</p>	<p>Need to consider the whole life aspects of the products in terms of use of finite natural resources, production impacts, construction/installation impacts, ease of re-use/dismantling/recycling and final pollution to land, water and air, including release of greenhouse gases.</p>
5	<p>Can the energy usage of the equipment be justified? Are there alternatives which use less energy (implying lower operating costs) or which are truly self-sufficient?</p>	<p>There are limited fossil fuel reserves, supply chain impacts and their use generates greenhouse gases (principally CO<sub>2</sub>) as well as local air pollutants; there are limited biomass resources, pressure on land for crop-growing, supply chain impacts and their use can generate pollutants and greenhouse gases (N<sub>2</sub>O and possibly others); using limited supplies of renewable energy can prevent this energy being used for other purposes. Energy efficiency is a key part of national and regional energy policy.</p>
6	<p>Will this result in changes in ease of accessing local facilities or public transport? In particular, will it affect those without a car or those with a disability or other mobility issue eg with baby or toddler? – include effects on community severance; quality, length and reliability of journeys for public transport, walking and cycling journeys; perceptions of personal safety; knowledge of facilities and how to get to them etc.</p>	<p>For people to be able to make good use of opportunities, they need to be able to access places to learn, work and enjoy leisure activities. They also need to be able to access fresh food and health facilities. See the cross-government guidance, in particular the DfT guidance, on Accessibility Planning, see also the Accessibility Strategy Statement within the West Midlands Local Transport Plan 2006.</p>
7	<p>Will this result in noticeable changes to noise levels? In particular, will it affect areas identified as experiencing high noise levels and areas identified as 'quiet areas'?</p>	<p>People are adversely affected by traffic noise and noise of machinery. Birmingham's Noise Action Plan seeks to reduce persistently high noise levels and preserve and enhance designated quiet areas.</p>