

BRACKNELL FOREST COUNCIL

INTELLIGENT TRANSPORT SYSTEMS (ITS) STRATEGY IMPLEMENTATION PLAN (2011)

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1. What is ITS ?

- 1.1 The term Intelligent Transport System (ITS) refers to the application of information and communications technology to transport infrastructure, enabling data to be collected and shared in order to maximise the efficiency of the highway network.
- 1.2 ITS systems have an important role to play in delivering transport policy objectives, with substantial benefits for traffic congestion and pollution reduction, as well as improving accessibility, providing integrated transport solutions and making best use of highway infrastructure and car park capacity.
- 1.3 The travelling public can benefit from the wide range of real time information including traffic delays and journey times, car parking availability and bus arrival time, enabling people to make more informed travel choices, make journeys more efficient and help to reduce the impact of transport on the environment.
- 1.4 ITS encompasses a range of technologies from traffic lights to in-vehicle satellite navigation systems.

2. Why does Bracknell Forest need ITS ?

- 2.1 In general, the national interest in ITS comes from the problems caused by traffic congestion and a synergy of new information technology for real-time control of the road network. Importantly, ITS can facilitate the delivery of a wide range of transport policy objectives, bringing significant benefits to transport users and those who live and work within the Bracknell Forest area.
- 2.2 ITS can deliver noticeable economic benefits through reduced journey times and increased journey time reliability, as well as reductions in pollution. The potential for an increase in the economic viability and vitality of urban areas, through the use of ITS, can make them attractive locations for future inward investment.
- 2.3 As travel patterns increase, it will not always be possible to provide new infrastructure to meet the demand, especially in a congested areas. ITS offers opportunities to manage and smooth traffic flow and can help reduce the need for new infrastructure. In particular, future development within Bracknell town will demand a reassessment of current arrangements for management of the road network and Bracknell Forest Council will need to establish a more 'hands-on' approach.
- 2.4 Although the current financial climate has affected the timescale of town centre redevelopment, some elements are already under way, other development is progressing and consequential improvements to the highway network are making it necessary to continue on the current path

towards ITS development such that network co-ordination and control are available to incorporate future change.

2.5 The Government has made it quite clear that it expects Local Authorities to make increasing use of ITS to deliver better transport. Recent legislation, such as the Traffic Management Act 2004, has placed a major bearing on the performance of local Highway Authorities in relation to network management and Part 2 of the Act places a duty on Local Authorities to understand and examine how their network is performing, manage their network effectively and minimise congestion.

2.6 In addition, ITS contributes to the following Council transport objectives:-

- Reduce delays associated with traffic congestion and improve the reliability of journey times
- Maintain and improve, where possible, the local transport network
- Encourage and promote accessibility by sustainable modes of transport
- Protect and enhance the quality of natural resources including water, air quality and the natural environment
- Reduce greenhouse gas emissions from transport
- Reduce casualties and improve safety on the local transport network

2.7 In turn, it has links to the Council's wider transport strategies, such as:-

- Congestion strategy
- Traffic Management strategy
- Network Management strategy
- Passenger Transport strategy (bus, rail, taxi)
- Smarter Choices strategy (walking, cycling, travel planning)
- Safety strategy
- Air Quality strategy

3. The ITS toolbox

3.1 Many authorities are already employing ITS to assist in the delivery of transport policies or to solve particular problems. Within Bracknell Forest, the key opportunities to exploit ITS technology lie within the following:

Traffic Signal Control (UTC and MOVA)

3.2 Urban Traffic Control (UTC) is a term used to describe the technique of co-ordinating traffic signals, normally through a centrally located computer. Areas where signals are relatively close together, and traffic flows are high, lend themselves to UTC co-ordination as benefits are

achieved by progressing platoons of traffic in an organised fashion. UTC systems can refine the operation of traffic signals on key network corridors and allow manual or automatic intervention when problems occur.

- 3.3 Microprocessor Optimised Vehicle Actuation (MOVA) is predominantly a method of controlling individual traffic signal junctions, and is used to maximise capacity and reduce delays through the introduction of localised intelligence within the junction controller.
- 3.4 Some key junctions within Bracknell Forest have already benefitted from the introduction of MOVA and this technology will play a key role in future highway improvements. However, given the necessary future advances in the control and co-ordination of the Borough's main network corridors, i.e. the A322, A3095, A329, the further expansion of UTC technology will increasingly be considered the predominant tool for the reduction of traffic congestion and vehicle emissions. The broader use of UTC within the Borough will also contribute towards the progression of wider co-ordination and control of ITS infrastructure - through UTMC (Urban Traffic Management Control) covered later in this document.

Contributes to the Council transport objectives:-

- *Reduce delays associated with traffic congestion and improve the reliability of journey times*
- *Maintain and improve, where possible, the local transport network*
- *Protect and enhance the quality of natural resources including water, air quality and the natural environment*
- *Reduce greenhouse gas emissions from transport*

Bus Priority

- 3.5 Bus priority is a name for the various techniques used to speed up the movement of buses through junctions with traffic signals. Buses normally signal their impending arrival (for example via GPS or radio systems) and on their arrival at the junction receive a green light. These measures can be combined with designated bus lanes.
- 3.6 Bus priority measures have existed within Bracknell Forest for some years, although recent advances in technology have meant that some modernisation of the original infrastructure has been necessary. Increasingly, the technology behind bus priority systems will stem from that used for Real Time Passenger Information (RTPI - covered later in this document) and will therefore be GPS based. A number of recent highway improvements within the Borough have incorporated this dual-purpose technology and future improvements to the network corridors, and key individual junctions, will also incorporate this feature. The further expansion of UTC and MOVA (covered earlier in this document)

across the Borough's road network will be key to facilitating bus priority measures and the resultant improvement to bus journey times.

Contributes to the Council transport objectives:-

- *Encourage and promote accessibility by sustainable modes of transport*
- *Protect and enhance the quality of natural resources including water, air quality and the natural environment*
- *Reduce greenhouse gas emissions from transport*

Car Park Variable Message Signing (CPVMS)

- 3.7 CPVMS, led by car park entry/exit counters, provides travellers with information on the number of available car parking spaces at the principal car parks within an urban area. This reduces queuing on the highway network and the search time and distance travelled to find available car parking.
- 3.8 Within a redeveloped Bracknell town centre, the use of CPVMS will be key contributor towards maintaining the efficient circulation of traffic around the core of the town, ensuring the economic viability of town's car parks and enabling the management of car trips during peak periods. The recent introduction of a modernised car park management systems, within both of the Council owned multi-storey car parks, will facilitate the use of CPVMS.

Contributes to the Council transport objective:-

- *Reduce delays associated with traffic congestion and improve the reliability of journey times*
- *Maintain and improve, where possible, the local transport network*

Strategic Variable Message Signing (SVMS)

- 3.9 SVMS are typically free text variable message signs which can be used to display strategic travel information at key decision points on the road network. Their intention can be to simply inform drivers of current, or imminent, network conditions or advise upon alternate routes to avoid congestion or a specific incident.
- 3.10 The future management of the Borough's main network corridors, and a redeveloped town centre, could benefit from SVMS technology in the longer term future. The implementation of signs, likely in a radial format, would provide opportunities to advise town-bound traffic of alternative transport opportunities and availability – such as future temporary car parking facilities at peak trading times.

Contributes to the Council transport objectives:-

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- *Reduce casualties and improve safety on the local transport network*

Real Time Passenger Information (RTPI) for buses

3.11 The increasing use of information technology and electronic communications has raised travellers' expectations on the provision of transport information. The purpose of bus RTPI is to provide an electronic display to people waiting at bus stops which will indicate to them the expected time of arrival of their bus. The broader intention of RTPI is that this type of information should build confidence in the use of public transport and encourage modal shift towards the bus.

3.12 The technology behind bus RTPI is predominantly GPS based and often performs the dual-purpose of facilitating bus priority (covered earlier in this document). A number of recent highway improvements within the Borough have incorporated this dual-purpose technology and this will assist in the wider implementation of bus RTPI. Early progress on RTPI within Bracknell Forest will continue to focus on key bus routes, particularly where cross boundary bus service information can be shared between Authorities and provided to the public. The further expansion of UTC and MOVA (covered earlier in this document) across the Borough's road network will be key to the expansion bus RTPI.

Contributes to the Council transport objectives:-

- *Encourage and promote accessibility by sustainable modes of transport*
- *Protect and enhance the quality of natural resources including water, air quality and the natural environment*
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Real Time Travel and Street Works Information

3.13 The ability to access information about problems on the network is central to journey planning. A travel web-site is an essential means of fulfilling the obligation to inform upon on travel and emerging technology is now enabling a variety of information to be presented on dedicated travel web-pages - such as road works information, average journey

times, real time passenger information, car park occupancy and general transport network information.

- 3.14 Road user's access to reliable multi-modal travel and network information within Bracknell Forest will be key to enabling informed decisions both before and during journeys.
- 3.15 Broader knowledge and visibility of network performance will also enable the co-ordination of street works to be conducted with evidence based knowledge of traffic patterns at key locations. This will aid in the assessment of likely disruption and enable appropriate directions to be placed upon works promoters.

Contributes to the Council transport objectives:-

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Air Quality Monitoring (AQM) action plans

- 3.16 Local authorities have a duty under Part IV of the Environment Act to review air quality in their area and assess whether the specified standards will be met. Where they will not be met the Local Authority is required to designate an Air Quality Management Area and develop an Action Plan to achieve improvements.
- 3.17 Congestion management can be used to control vehicle emissions by optimising capacity of the highway network or, in extreme case, constraining traffic flow into vulnerable areas. The further application of UTC and MOVA (covered earlier in this document) within Bracknell Forest will provide an opportunity for selected areas to be given priority protection by distributing vehicles flows, and therefore emissions, more equitably or to where they are less harmful. AQM plans can be adopted to hold traffic queues outside an area when congestion or pollution exceeds a pre-set threshold.

Contributes to the Council transport objective:-

- *Protect and enhance the quality of natural resources including water, air quality and the natural environment*
- *Reduce greenhouse gas emissions from transport*

Automatic Number Plate Recognition (ANPR) and Closed Circuit Television CCTV

- 3.18 CCTV cameras can be used by traffic control centres (UTMC - covered later in this document) to enable traffic management decisions to be made in real-time. They allow network managers to refine the operation of traffic signals on key corridors and assist with manual intervention when problems occur.
- 3.19 By connecting ANPR devices UTMC systems it is possible to monitor the travel of individual vehicles, automatically providing sanitised information about the speed and flow of traffic on various routes. Permanent ANPR devices are now being introduced by UK Police Forces on many key traffic routes (for the purpose of crime prevention), including Bracknell Forest, and opportunities exist for shared data.

Contribution to the Council transport objective:-

- *Reduce delays associated with traffic congestion and improve the reliability of journey times*
- *Maintain and improve, where possible, the local transport network*
- *Reduce casualties and improve safety on the local transport network*

4. UTMC – exploiting ITS technology

- 4.1 Urban Traffic Management Control (UTMC) systems are designed to allow the different applications used within modern ITS to communicate and share information with each other. This allows previously disparate data from multiple sources such as traffic signal installations, real time bus passenger information systems (RTPI), permanent traffic counter sites, car park management systems, street works databases, air quality monitoring stations and wider travel information, to be amalgamated into a central console or database.
- 4.2 The idea behind UTMC is to enable operators to maximise their transport network potential by using an intelligent system to co-ordinate and control its use - either through direct intervention or via higher level strategies/operating plans. In addition, and very importantly, UTMC provides a platform from which travel and transport information can be disseminated to, and accessed by, the general public.
- 4.3 Progress on UTMC initiatives within Local Authorities are accelerating, and opportunities already exist to exchange network and local/regional travel information through the linking of UTMC systems. It is expected that the current development of regional multi-modal travel information for the general public, and opportunities to co-ordinate cross-boundary initiatives will place pressure on those Authorities' without a UTMC agenda.

5. Localised UTMC within Bracknell Forest

- 5.1 In 1998 Bracknell Forest became a Unitary Authority with responsibility for its highway network. At this time Bracknell Forest, Reading, Wokingham and West Berkshire (Authorities) determined to enter into a shared arrangement whereby Reading BC would act as lead Authority for the centralised control of traffic signals
- 5.2 Within this existing arrangement, Reading BC assumes a basic co-ordination role in relation to traffic signal operation, fault reporting and certain aspects of maintenance management. Whilst this arrangement provides a basic function of ITS co-ordination, it does not enable any direct involvement by BFC in the monitoring and control of its transport network - or the delivery of travel/transport information. In the context of fulfilling the Council's network management duties, and the management of future ITS expansion related to new development within the Borough, a move towards localised co-ordination and control is considered necessary.
- 5.3 A core part of localised UTMC will be full control of significant junctions within the Borough. However, full and sudden total responsibility for control represents a sizeable challenge to the Council which can be avoided by adopting a planned and a progressive approach. A gradual migration of the control and co-ordination functions to Bracknell Forest will, in the very early stages, centre on monitoring and optional (limited) control. The initial steps will focus on establishing a platform upon which to build a localised UTMC capability.
- 5.4 In recent years, telecommunication protocols within the ITS industry have meant that UTMC systems can be established relatively easily, compared to 1998 when the Reading BC system was established. Bracknell Forest has taken the first step towards local UTMC capability through the procurement of a common UTMC database, which provides an open data store to collect and disseminate traffic and transport information from existing ITS systems.
- 5.5 Due to its simplified and user-friendly form, interface software is able to provide an overview of the transportation network in its broadest sense - either at an operational or strategic level, dependant on the application. In addition, the interface approach can be utilised for the centralisation and dissemination of travel and transport information to the public through a variety of channels. The Council has now acquired an interface capability along with the control software for the first phase of Car Park Variable Message Signs (CPVMS) associated with the forthcoming Waitrose store within Bracknell town centre.

6. UTMC / ITS Strategy model

- 6.1 Figures A and B (attached) show a progressive UTMC/ITS development architecture that will be pursued within Bracknell Forest during the next 5 years. Progress is largely influenced by Bracknell town centre

regeneration and the need for greater efficiency from the improving highway network, in order to accommodate planned development.

- 6.2 **Figure A** identifies the interim configuration, currently being pursued, which focuses on local monitoring and limited control of the ITS network alongside the early stages of promoting travel/transport information to the public. **Figure B** illustrates a more advanced configuration, in later years, with fully localised UTMC control.

7. ITS Strategy

Over the life of the current Transport Plan (2011-2026) the ITS Strategy Implementation Plan will be to:

- Use ITS tools to support other strategies within the Local Transport Plan.
- Plan the expansion of ITS in a co-ordinated manner.
- Establish an effective UTMC system for Bracknell Forest to ensure that ITS tools are used to their fullest potential.
- Improve monitoring and management of the road network, including the development and implementation of tools and techniques to manage congestion, maximise efficiency and reduce vehicle omissions.
- Use technology to give priority to types of vehicles or road user, where appropriate.
- Promote partnership working and data exchange with neighbouring Authorities.
- Provide reliable travel information to road users, so that they can make informed decisions before and during their journey
- Use ITS technology to increase confidence in public transport
- Explore new opportunities for ITS technology to improve road safety

8. Action Plan (5 year)

The **UTMC Action Plan** table (attached) suggests a planned progression towards a localised UTMC capability within the Borough.