


Bromsgrove District Core Strategy – Infrastructure Delivery Plan

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Bromsgrove - IDP

Worcestershire County Council

March 2013



DRAFT



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Document History

Bromsgrove Development Plan – Infrastructure Delivery Plan

Worcestershire County Council

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- Appendix B Bromsgrove and Redditch – Planning Data**
- Appendix C Predicted number of trips from development sites by mode**
- Appendix D Infrastructure Delivery Plan – Scheme Tables**

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1 Executive Summary

Bromsgrove District Council (BDC) and Redditch Borough Council (RBC) are preparing their Core Strategies. To assist with the development of these strategies, Halcrow has been commissioned to support Worcestershire County Council (WCC) with identifying the necessary transport related infrastructure and services, and giving advice on and preparing the transport evidence to contribute towards an Infrastructure Delivery Plan (IDP). The transport infrastructure (highway, public transport, cycle and pedestrian) and public transport services identified will be based on the assumptions set out in the Bromsgrove District Core Strategy.

The Infrastructure Delivery Plan (IDP) will give details of the infrastructure that is required to support the growth set out in the BDCS. It is envisaged that the information set out in the IDP will be used to develop a Community Infrastructure Levy (CIL), and to inform and support negotiations with developers about site specific s106 agreements. The IDP will also inform the development of the LTP3 packages and schemes.

This report sets out the transport mitigation measures proposed for Bromsgrove District. A similar report identifying transport mitigation measures for Redditch Borough is also available.

A key premise of this project is to recognise that the quantum of development proposed for Bromsgrove will not only have a local transport impact (immediately adjacent to the site) but also an impact on the strategic transport network further afield. That is, whilst the local impacts of any development can be identified, assessed and mitigation measures implemented, for locations further away from the proposed development sites, whilst the highway impact issues to address are all to readily obvious, their cause is more difficult to identify.

Put another way, the nature of the highway network means that a development site (or the summation of a number of small development sites) can cause a significant impact some distance from the traffic generation source. That is, as congestion occurs at pinch points throughout the network, it is caused by trips travelling both short and long distances. However, once the origin of these trips has been identified, an assessment of the allocation of mitigation measure costs can be identified.

In order to undertake a network wide assessment of the transport network in Bromsgrove, and specifically assess the cumulative transport impact on transport networks resulting from development sites proposed through the BDCS, a Vehicle/Trip Generation modelling tool was developed. The modelling tool enables:

- the calculation of the numbers of trips that each proposed development site will generate;
- an assessment of the way in which those trips will route on the network; and
- the ability to sum the trips to establish an overall impact assessment.

The modelling tool, developed jointly with Redditch Borough Council, in the form of a strategic gravity model, draws upon existing evidence and was previous related studies, namely:

- Bromsgrove Town Development Spreadsheet Model;
- Accessibility Assessments; and
- WCC Officer Workshops

Where appropriate the Vehicle/Trip Generation Model was validated for consistency against the previous studies.

In proposing future year transport infrastructure schemes, the scheme listings have, where appropriate, drawn on existing Transport Packages. For example, scheme proposals identified through the Bromsgrove Transport Package (BTP) have been taken as the core schemes for Bromsgrove town.

Where additional issues have been identified in Bromsgrove and the outlying towns in the district, this project has identified further locations where mitigation is required to overcome or reduce the impact of proposed development on the transport network. That is, there are locations outside Bromsgrove that do not currently have the benefit of an existing package of measures identified through the BTP strategy. Furthermore, there are some development sites that were not considered at the time the BTP strategy was developed. For these sites, an additional task has been undertaken to identify schemes and other mitigation measures. These proposed schemes have been identified with the assistance of the Vehicle/Trips Generation Model.

The transport schemes proposed have been identified to mitigate against predicted future year transport issues. That is, the proposed highway infrastructure schemes aim to improve capacity at key junctions which are anticipated to incur additional delays in future years as a result of the proposed housing and employment growth proposed for the area covered by Bromsgrove District.

The proposed sustainable transport infrastructure schemes aim to connect the proposed development sites to the existing transport network. Where appropriate, measures are proposed to improve the existing transport network with the objective of encouraging greater use of more sustainable transport modes.

Policy/Strategy, Feasibility/Deliverability and the appropriate Design Standards and Guidelines have been considered in developing the list of scheme proposals. Each of the proposed transport schemes has a 'cost for implementation' identified. Costs include construction costs, relevant percentage uplifts to account for scheme preparation and development costs over and above the basic construction and materials and optimism bias.

A breakdown of the costs for the proposed transport schemes is provided below.

Table 1 .1 – Costs associated with Improved Bus Service Provision (includes service enhancements across Bromsgrove District and Redditch Borough)

Bromsgrove and Redditch Bus Operations - Routes and Frequencies

Note: Gold, Silver and Bronze Bus Routes/Roadside Infrastructure referenced as per Worcestershire County Council Passenger Transport Infrastructure Best Practice Report (November 2007)

Location	Potential Scheme	Costs
Bromsgrove Town Centre Services to link developments - 'Clover-leaf'	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 800,000.00
Inter-Urban - Service 144 - Birmingham to Worcester (via Bromsgrove and Catshill)	Gold Standard Bus Routes, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 2,200,000.00
Inter-Urban - Service X3 - Kidderminster to Redditch (via Bromsgrove)	Gold Standard Bus Routes, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 1,320,000.00
Inter-Urban - Service 143 - Birmingham to Redditch (via Bromsgrove and Catshill)	Gold Standard Bus Routes, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 1,680,000.00
Inter-Urban - Service 145 - Bromsgrove to Redditch (via Longbridge)	Gold Standard Bus Routes, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 1,200,000.00
Redditch Service 50 (Brockhill Development)	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 400,000.00
Redditch Service 51 (Brockhill Development)	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 400,000.00
Redditch Service 52 (Brockhill Development)	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 400,000.00
Redditch Service 61 (Developments east of the town centre)	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 667,000.00
Redditch - Webheath Service	Silver Standard Bus Route, Service Frequency; Mon-Sat (15 mins), Evenings and Sundays; min half hourly Periods of Operation; Mon-Sat (0600-1900), Evenings (1900-2300), Sundays (0800-2000)	£ 134,000.00
SUB TOTAL		£ 9,201,000.00

Table 1.2 – Costs associated with Highway Infrastructure Schemes in Bromsgrove District

Highway Infrastructure Schemes	Costs (£/millions)	
	Total (Construction)	Ongoing Maintenance and/or Operating Costs
TOTAL	£22.37m	£1.14m
Bromsgrove	£18.72m	£1.27m
Hagley	£1.44m	£97k
A491 Corridor	£370k	£25k
HGV Lorry Park	£1.84m	£125k

Table 1.3 – Costs associated with Highway Infrastructure Schemes in Bromsgrove District

Sustainable Transport Schemes (Walking and Cycling)	Costs (£/millions)	
	Total (Construction)	Ongoing Maintenance and/or Operating Costs
TOTAL	£12.23m	£128k
Bromsgrove	£8.87m	£97k (excluding town centre public realm scheme)
Hagley	£210k	£4k
Longbridge	£130k	£2.65k
Barnt Green / Alvechurch	£2.46m	£12.65k
Wythall	£570k	£11.9k

2 Introduction

2.1 Background

Bromsgrove District Council (BDC) and Redditch District Council (RDC) are preparing their Core Strategies. To help inform the transportation aspects of these strategies, Worcestershire County Council (WCC) has instructed Halcrow to assist with the assessment of transport impact of the proposed new development.

This report focuses on the findings on the study relating to Bromsgrove District. A similar report focusing on Redditch Borough is also available.

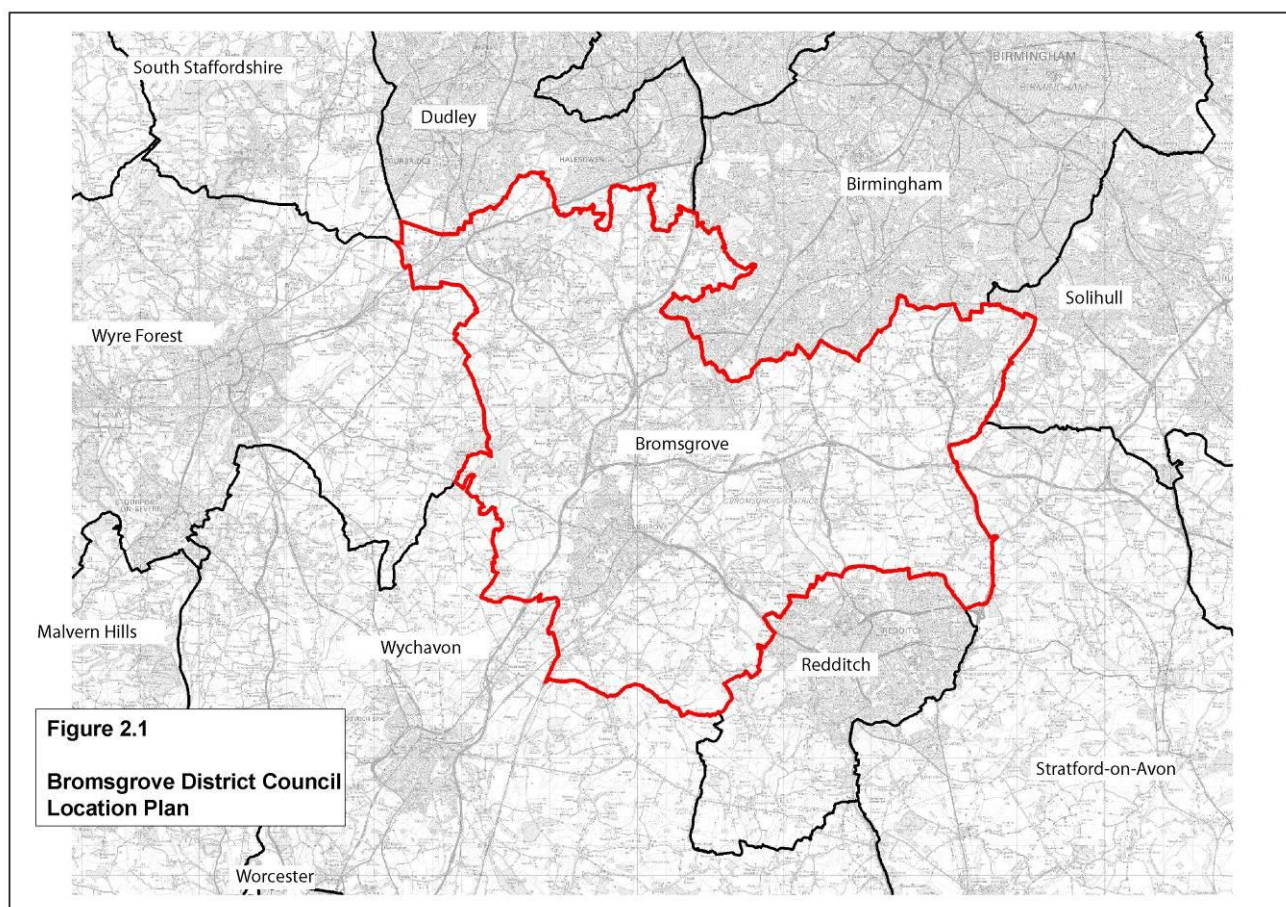
The Bromsgrove District Core Strategy (BDCS) considers the long term vision and objectives for Bromsgrove District Council, up to the year 2022, and includes the policies for delivering these objectives in a planned and cohesive manner, through:

- providing policies to ensure that all development is sustainable;
- allocating larger 'strategic' sites across Bromsgrove District and Redditch Borough;
- identifying infrastructure requirements to support the delivery of the development plan, including transport, education, health, water and energy. This will be the Infrastructure Delivery Plan; and
- assessing all other potential development sites whether it is for housing, employment, retail, education, health, community use or indeed an open space use.

The BDCS will replace the existing Local Plan for Bromsgrove District when it is adopted in May 2013. It will also supersede elements of Worcestershire County Council's County Structure Plan.

The relationship of the authority areas and their environs are shown in Figure 2.1

Figure 2.1 – Bromsgrove District Council Location Plan



2.2 Purpose of this report

Halcrow has been commissioned to support Worcestershire County Council (WCC) with identifying the necessary transport related infrastructure and services, and giving advice on and preparing the transport evidence to contribute towards the Infrastructure Delivery Plan (IDP). The transport infrastructure (highway, public transport, cycle and pedestrian) and public transport services identified will be based on the assumptions set out in the Draft BDCS.

The Infrastructure Delivery Plan (IDP) will give details of the infrastructure that is required to support the growth set out in the BDCS. It is envisaged that the information set out in the IDP will be used to develop a Community Infrastructure Levy (CIL), and to inform and support negotiations with developers about site specific s106 agreements. The IDP will also inform the development of the LTP3 packages and schemes.

The methodology adopted through this study, agreed between Halcrow and WCC through Officer Meetings and Workshops, has created a means of providing an evidence base for the transport infrastructure (highway, public transport, cycle and pedestrian) and public transport services necessary to mitigate the transport (vehicle access and movements, multi-modal trip generation) impacts of the potential development sites identified in the draft BDCS.

This report identifies the transport schemes required to support the growth proposed for Bromsgrove District contained in the BDCS and provides supporting evidence to demonstrate the way in which the transport schemes contribute towards the wider aims of the BDCS. The report contains a description of the adopted methodology used to derive the list of proposed transport schemes and sets the work in the context of other transport evidence work recently undertaken for Bromsgrove.

2.3 Structure of this report

Following this introductory chapter:

- Chapter 3 sets out the methodology followed to identify schemes. This includes an introduction to the spreadsheet based transport model used to assess future trip generation by all modes of transport
- Chapter 4 considers previous transport evidence work undertaken in Bromsgrove and how this comprehensive review has drawn upon and complemented the previous work undertaken.
- Chapter 5 describes the baseline performance of the transport network
- Chapter 6 introduces and contains the scheme tables

The report contains four appendices:

- Appendix A Modelling Assessment Tool: Contents and Description
- Appendix B Bromsgrove District Core Strategy – Planning Data
- Appendix C Forecast number of trips from development sites by mode
- Appendix D Infrastructure Delivery Plan – Transport Scheme Tables

3 Methodology

3.1 Introduction

The methodology used to complete this project was agreed jointly between Halcrow and Worcestershire County Council.

The methodology adopted has:

- Understood, from previous work, relevant policy guidance, development quantum's, types and locations and agreed parameters for the project;
- Established the transport network and infrastructure baseline conditions for Bromsgrove thereby understanding the network performance for all modes of transport and to identify potential key gaps in transport infrastructure and service provision across the Bromsgrove District Council area;
- Developed a joint Vehicle/Trip Generation model for Bromsgrove District Council and Redditch Borough Council to act as an assessment tool to assist with the identification of schemes to support proposed development contained in the draft BDCS; and
- Identified infrastructure schemes and services to mitigate against the impacts of proposed development.

The methodology adopted has ensured that the best use was made of existing data and tools available. It has set a clear foundation for the identification of schemes and has provided a means by which complex 'knock on' effects can be identified and assessed.

The way in which schemes have been identified has recognised environmental and deliverability factors as well as requirements to overcome identified problems and create opportunities for more sustainable travel choices.

The overall approach has been based on achievable interventions. Furthermore, it does not rely on an approach focussing on a single or limited number of schemes that could not be implemented in the required timescale.

3.2 Need for assessment

A key premise of this project is to recognise that the quantum of development proposed for Bromsgrove an surrounding area will not only have a local transport impact (immediately adjacent to the site) but also an impact on the strategic transport network further afield. That is, whilst the local impacts of any development can be identified, assessed and mitigation measures implemented, for locations further away from the proposed development sites, whilst the highway impact issues to address are all to readily obvious, their cause is more difficult to identify.

The nature of the highway network means that a development site (or the summation of a number of small development sites) can cause a significant impact some distance from the traffic generation source. That is, as congestion occurs at pinch points throughout the network, it is caused by trips travelling both short and long distances.

However, once the origin of these trips has been identified, an assessment of the allocation of mitigation measure costs can be identified.

Thus a tool that allows the:

- calculation of the numbers of trips that each proposed development site will generate;
- the assessment of the way in which those trips will route on the network; and
- has the ability to sum the trips to establish an overall impact assessment

....will enable a network wide assessment to be conducted. Such an assessment tool has been prepared jointly for Bromsgrove District and Redditch Borough for the purposes of this project. Whilst the tool is necessarily strategic in nature, it does include all the key routes and most importantly key junctions. Without such a tool it is difficult to assess the combined impact of development sites over a large area.

Existing data, and recently undertaken transport network assessments for both Bromsgrove District and Redditch Borough, also provide the means to identify the need for transport infrastructure and services resulting from the proposals in the Draft BDCS. This data includes accessibility assessments and individual spreadsheet models developed to assess Bromsgrove (and surrounding area) and Redditch development. A review of previous studies informing the IDP and the associated transport scheme proposals is provided in Section 3 of this report.

3.3 Development of assessment tool

The assessment tool is a spreadsheet model that combines a number of functions:

- Multi-modal trip generation model;
- Trip routeing model;
- Gravity model; and
- Presentation and analysis of results

[See Appendix A for a Technical Note setting out assumptions and the methodology applied to develop the Vehicle/Trip Generation Modelling tool used to assess the impact of developments across Bromsgrove District Council and Redditch Borough Council. The Technical Note also contains comparison to other models being used for assessment in the area.]

In summary, the model provides a means of assessing the cumulative assessment of the impact of proposed development on the highway network across Bromsgrove District and Redditch Borough. The development details provided by each authority are contained in Appendix B. The model covers the AM and PM peak periods and provides trip generation data for walk, cycle, bus and highway. In addition, for walk, cycle and public transport, a full 24 hour period assessment of generation is made.

The model concentrates on the area covered by Bromsgrove District and Redditch Borough, but recognises key destinations for travel beyond these two districts. Highway (car) trips are assessed through a trip generation calculation and the assigned to the modelled highway network. The assignment of highway trips is

based on the strategic and main road network serving the area. That is, motorways, the main 'A' roads and key 'B' class roads in the area. For further information on the trip origins and destinations as modelled through the Vehicle/Trip Generation Model refer to Figure 7.1 in the Modelling Assessment Tool Technical included as Appendix A of this report.

In terms of non-car trips (sustainable modes), the model contains a 'trip generation' element. The model calculates the likely number of trips by walk, cycle, rail and bus modes from each of the development clusters. The model takes account of relevant local mode share data and applies appropriate trip rates to indicate the number of additional trips on the transport network resulting from the proposed development sites. For further details regarding mode share and trip generation details please refer to the Modelling Assessment Tool Technical Note included as Appendix A of this report.

3.4 Overview of assessment results

The Vehicle/Trip Generation Model has been used to assist the identification of the schemes set out in this Technical Note. Appendix C of this report contains a listing of trip generations from each cluster/site. The results have been used to identify the locations where schemes should be considered to overcome the pressure points in the network shown to be an issue in the forecast year scenario. It is noted that the model has not been the sole source of scheme identification, other sources include:

- Bromsgrove and Redditch Town Development Models
- Accessibility Assessments
- WCC Officer Workshops

These sources have all combined to provide a comprehensive assessment of network requirements to accommodate forecast development proposals. The inputs from this assessment are set out in Section 3 of this report.

3.5 Overview: Bromsgrove District Existing Highway Issues

The key highway routes of Bromsgrove District are shown on Figure 3.1. Figure 3.1 shows that the area is divided by the M5 and M42 Motorways. Access to the M5 Motorway is via Junctions 4 (in the north of the District) and 5 (in the south of the District). Located between M5 junction 4 and 5 is the intersection linking the M5 and M42. Located in the north east of the district are Junctions 1, 2 and 3 of the M42.

The main intersection of A-Roads in Bromsgrove town is the A38 and the A448. The junction currently operates as a large roundabout with two lane approaches on all arms. The A38 travels from north to south linking Birmingham and the M42 Junction 1 through Bromsgrove towards Droitwich and Worcester. The A448 travels from east to west linking Redditch to Bromsgrove and onwards to Kidderminster.

The A38 corridor located to the east of Bromsgrove town centre has a number of signalised and roundabout junctions providing access to and from housing, employment and commercial developments. This section of highway has congestion issues (reference from the Bromsgrove Transport Study) and provides a barrier to

sustainable transport modes in the town (reference from the Bromsgrove Transport Study).

The A448 routes east to west through Bromsgrove town centre. All B Road distributor roads (including the B4091, B4184 and B4091) into Bromsgrove town centre link to the A448 at various roundabout and signalised junctions around the town centre retail area.

The A448 provides the main link road to Redditch from Bromsgrove. Traffic accessing the A448 from Bromsgrove towards Redditch must route through the A448/A38 junction east of Bromsgrove town centre. This is the last eastbound access point to the A448 until Redditch. Running parallel in the east-west direction to the A448 is the B4184 which provides an alternative route between the two towns. Traffic routeing from the eastern residential areas of Bromsgrove and the Railway Station are likely to route this way to Redditch as access to the A448 is only via the A38 corridor.

North of Bromsgrove town centre the A38 links to the M42 at Junction 1. This junction operates as a signalised junction with two lane approaches on all arms. The slip roads providing access to the M42 are east facing only.

The A38 continues north from M42 Junction 1 through Catshill to link to M5 Junction 4 and the A491 which links west towards Hagley. M5 Junction 4 operates as a signalised roundabout with 3 approach lanes on all arms. The A38 routes from this location north east towards the Birmingham Conurbation through Rubery and Longbridge.

The A491 between M5 Junction 4 and Hagley operates predominantly as a dual carriageway with section of single carriageway. The town of Hagley is located at the intersection of the A491 and the A456. The A491 and the A456 interact at a large roundabout and a signalised junction with all approach arms having 2 lanes. The A456 corridor through Hagley travels from the south west (Kidderminster) in a north east bound direction towards the Birmingham Conurbation through Halesowen.

In the north west of the district the main A roads (A441 and A435) link Redditch with the Birmingham Conurbation passing through towns such Alvechurch and Wythall and through rural Bromsgrove.

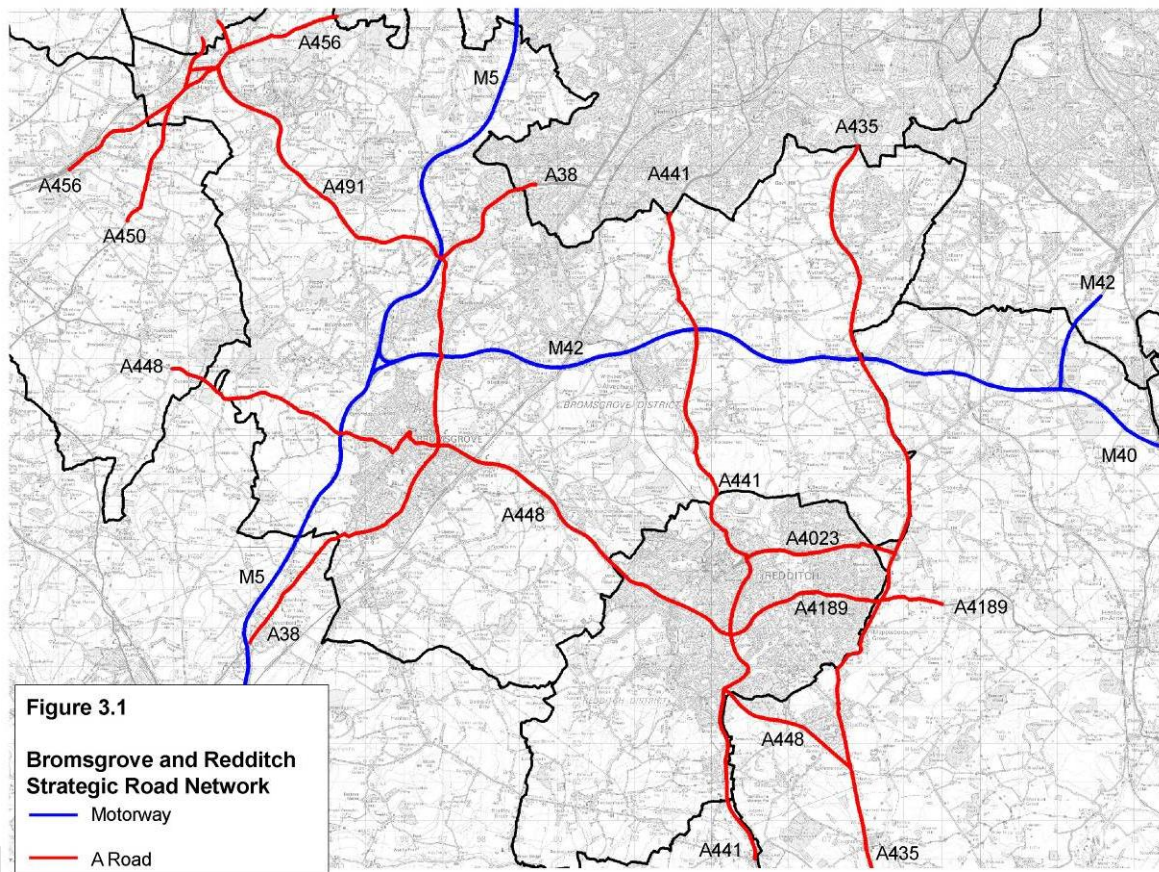
South of Bromsgrove town centre the A38 provides the route to access the M5 at Junction 5. This junction operates as a 'dumbell' junction with roundabouts located on both sides of the motorway. Beyond the motorway intersection the A38 routes south towards Droitwich.

The location of the development sites proposed for Bromsgrove District Council indicates that the A38 corridor and the key intersection with A448 are fundamental to the future traffic routeing patterns around the district. Although the proposed development sites are spread around the district much is focussed on the area in and around Bromsgrove. The destinations these trips will look to travel to will ensure much of the additional traffic will be required to route via the A38 and/or the A448 at some point of their journeys. (For further information on the trip origins and destinations as modelled through the Vehicle/Trip Generation Model refer to Figure 7.1 in the Modelling Assessment Tool Technical Note included as Appendix A of this report). Evidence from the Bromsgrove Transport Package Report suggests many of

the junctions located along these key corridors are already at operating at levels approaching or at capacity.

Details of the forecast year vehicle flows associated with the proposed development sites are provided in the Modelling Assessment Tool Technical Note included as Appendix A of this report.

Figure 2.1 – Bromsgrove and Redditch Strategic Road Network



3.6 Overview: Existing Public Transport (bus) Issues

The existing bus network operating in Bromsgrove District, in terms of its proximity to proposed development sites, is described below.

Overall, the bus network in operation across Bromsgrove District is concentrated on Bromsgrove and the other main towns within the District area, namely Catshill and Hagley. In Bromsgrove service patterns connect the outlying residential and employment areas on the edge of the town with the town centre. A number of these routes link Bromsgrove with Catshill located to north of Bromsgrove and the M5 Motorway.

Bromsgrove and Catshill are connected to surrounding towns by a number of different bus services – this is a function of their relative location. Examples are as follows;

- 143 – Birmingham to Redditch (via Bromsgrove and Catshill)

- 144 – Birmingham to Worcester (via Bromsgrove and Catshill)
- X3 – Kidderminster to Redditch (via Bromsgrove)

A number of other services from Bromsgrove link to the key surrounding towns, notable examples include;

- 141 – Bromsgrove – Droitwich
- 142 – Bromsgrove – Redditch
- 145 – Bromsgrove – Redditch
- 183 – Bromsgrove – Redditch
- 318 – Bromsgrove – Stourbridge

Hagley is served by a number of bus routes that provide direct links to a number of surrounding towns including Bromsgrove, Stourbridge, Birmingham and Kidderminster.

In order to accommodate the growth contained within the Draft IDP a set of bus operation standards have been developed by WCC. These are consistent with the policies set out in the Worcestershire LTP3. An assessment of total cost to provide services to these standards on key corridors has been calculated. It is recognised that these services may be already supplied, either wholly or in part. Hence, the role of the IDP is to ensure that this level of service is maintained in order to retain the attractiveness of services and to provide the necessary capacity to accommodate the forecast bus passenger demand. If this level of service is not met, whilst some individuals may have the ability to transfer mode to use a car (resulting in increased pressure on the highway), for others, the potential travel opportunities by bus to access employment, education and health opportunities will be lost.

These bus service operations aspirations would be accompanied by infrastructure to deliver reliable and attractive bus services. These include bus shelter provision and access arrangements to these shelters from the development sites, as well as priority measures at the most congested locations. Bus shelter/stop provision is proposed to fit with WCC's 'Gold', 'Silver' and 'Bronze' standards for Bus Stops.

A means of assessing the funding requirement to create a reliable bus service corridor has been developed for the purposes of this work. From work previously carried out by Halcrow on behalf of WCC it is possible to develop a 'cost rate' for 'bus corridor infrastructure measures'. From the three WTS corridors that have been costed in detail a cost rate of £170,000 per 100m for 'general measure to improve bus reliability and service quality' has been calculated.

Applying this to other urban corridors has provided a cost to implement the suite of measures needed to deliver the desired bus service standards in the towns across the area covered by Bromsgrove District.

3.7 Overview of Existing Pedestrian Issues

To identify pedestrian infrastructure requirements to support the development assumptions put forward through the BDCS, each development site has been considered. The number of anticipated pedestrians travelling to and from each site

over a 24 hour period has been calculated and used to inform the assessment. The analysis focussed on identifying links between the proposed development sites and the existing pedestrian network in terms of footways and pedestrian crossing facilities (where required).

The infrastructure requirements do not include pedestrian infrastructure within the development sites.

3.8 Overview of Existing Cycle Network

To identify cycle infrastructure requirements to support the development assumptions put forward through the BDCS, each development site has been considered. The number of anticipated cyclists travelling to and from each site over a 24 hour period has informed the process. Analysis has focussed on identifying links from the proposed development sites to existing cycle infrastructure.

The cycle network in Bromsgrove comprises of a combination of recommended on-road routes (that have been assessed for suitability) and a series of dedicated off road routes, some of which form part of the National Cycle Network. The cycle routes map for Bromsgrove (taken from the WCC website) have been used to assess linkages from proposed development sites to existing cycle infrastructure.

The cycle infrastructure included on the proposed list of schemes includes all aspects of cycle infrastructure including signage, on-road cycle marking and where appropriate dedicated off road cycle links.

It has been assumed cycle infrastructure within the development sites will be considered by developers and will meet relevant LTP3 and other policy & design standards, this includes all cycle paths and the appropriate amount of cycle storage facilities.

3.9 Overview of Public Transport (Rail) Issues

The local rail network provides a valuable contribution towards local and longer distance travel. Indeed, Bromsgrove and Hagley benefit from direct rail services to regional and national destinations by the rail network. The local rail network is shown on Figure 3.2.

To increase patronage of the rail network from stations within Bromsgrove District, WCC has identified improving access to the railway stations as key requirement for investment.

The important role of attractive walking and cycling routes to the stations has been described elsewhere in this report. Hence, for Bromsgrove station, improving access to Bromsgrove Railway Station for walking and cycling is critical from both existing and proposed development sites. Also, given the location of Bromsgrove Railway Station, bus access needs to be considered.

In terms of the other railway stations within the District, as shown in Figure 3.2, the following points were raised by WCC for inclusion in this document;

Hagley:

- Requirement for Wheelchair Access to the Railway Station; and

- Requirement for Cycle Parking.

Alvechurch:

- Potential need to extend the Rail Station Car Park; and
- Redditch Line Enhancements (Network Rail) – include extra platform and bridge at Alvechurch Railway Station.

Barnt Green

- Requirement for Wheelchair Access to the Railway Station;
- Improvements required to the RTI system; and
- Birmingham Cross-City line project (WCC, Centro, Network Rail) to increase the number of Bromsgrove Barnt Green Services

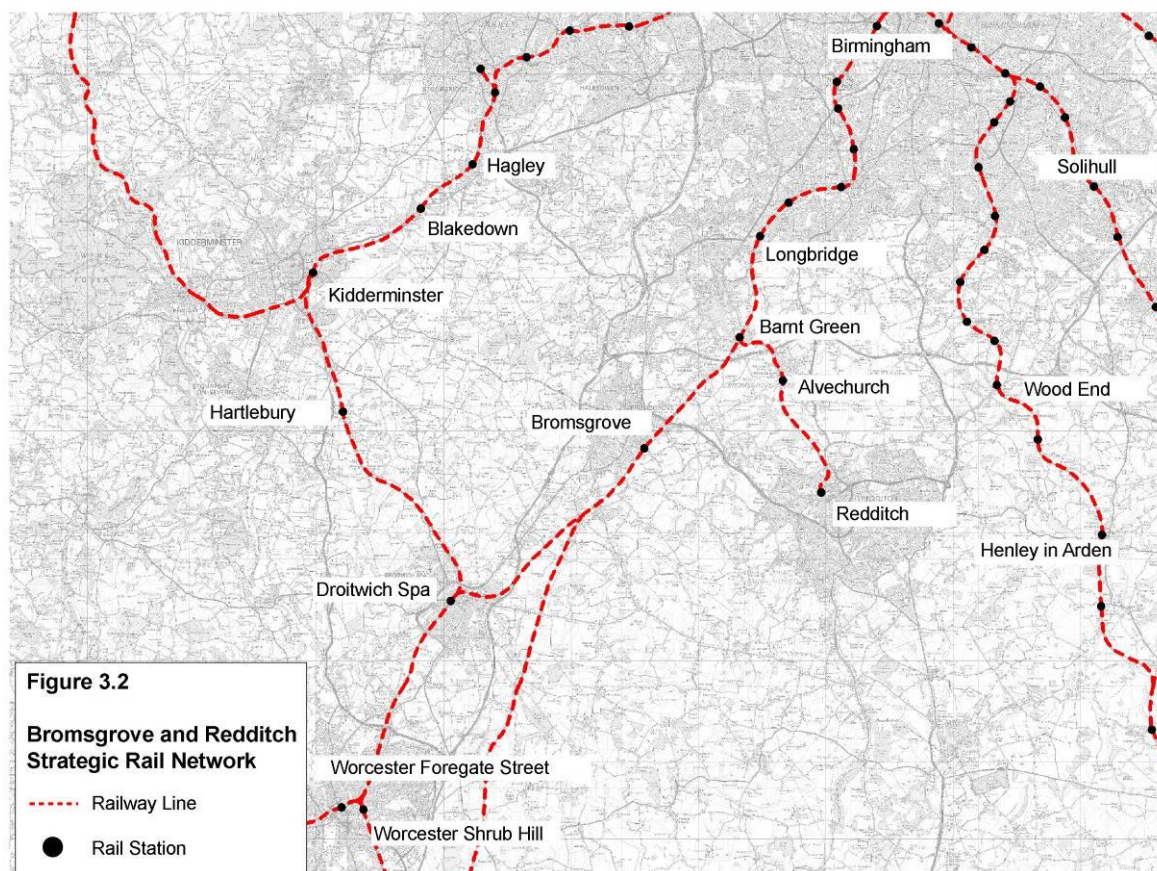
Wythall

- Currently no formal car parking facility in vicinity of the railway station, as a result many rail passengers use Whitlocks End as an alternative where there is better parking provision. Therefore there is a requirement for a station car park at Wythall Railway Station;
- Upgrade to the RTI system required; and
- Requirement to upgrade bus stop infrastructure located outside the railway station.

Longbridge

- Walk and cycle access from development sites to the railway station are critical

Figure 3.2 – Bromsgrove and Redditch Rail Network



Network Rail is currently consulting with stakeholders with a view to implementing a rail enhancement project on the section of line linking Redditch and Birmingham New Street. The proposals include the construction of a second section of railway track which will run from north of Alvechurch Station for approximately 3km towards Redditch. The scheme would have a number of benefits for passengers from Bromsgrove district including:

- Increased services between Alvechurch and Barnt Green to Redditch and into Birmingham;
- More space for passengers travelling between Alvechurch and Barnt Green to Redditch and into Birmingham;
- A more flexible service; and
- An improved railway station at Alvechurch

Based on predicted timescales the scheme is due for completion by the end of 2014.

4 Review of previous BDCS work

4.1 Introduction

In order to ensure alignment between all transport studies highlighting requirements for future year transport infrastructure within Bromsgrove District, the following studies have informed this project:

- Bromsgrove Transport Package – Report on Phases 1-3 (May 2012)
- Bromsgrove Allocation Accessibility Study; and
- Bromsgrove Spreadsheet Modelling (2011)

A brief discussion of how each of the studies was used follows.

4.2 Bromsgrove Transport Package (Phases 1 – 3)

The Bromsgrove Transport Package (BTP) was developed to identify the existing and forecast transport issues in Bromsgrove to inform the content of the Bromsgrove LTP3 Package (Phases 1-3 of the process). The first three phases of the BTP report significant data gathering and analysis to develop a robust evidence base upon which to develop a clear transport strategy for the District. The BTP provides a commentary of the current operation of Bromsgrove transport infrastructure and service, and how this is forecast to change as a result of new planned residential and commercial development generate travel demand. The report seeks to identify those areas where investment is required to resolve current and forecast transport related issues to meet with the agreed transport policy objectives.

The BTP reiterates the main policy objectives of the Bromsgrove District Core Strategy. These include:

- Enhance economic activity and growth;
- Reduce impacts of transport on the local environment (noise and air quality);
- Improve the safety and security of the transport network;
- Enhance accessibility to key services and facilities for all modes;
- Conserve and improve the natural and historic built environments; and
- Enhance the overall quality of the transport asset.

The BTP concludes that transport has a critical role to play in defining of the future of Bromsgrove District. Significant data collection and analysis completed for the purposes of the BTP provided evidence for the identification of a series of recommended transport schemes to tackle identified issues. These transport schemes meet with the objectives of the BTP. The recommended schemes include:

- Bromsgrove Eastern Bypass (A38) Corridor Enhancement Scheme;
- Bromsgrove Town Junctions Enhancement Programme;
- Bromsgrove Walking and Cycling Network Development Scheme;

- Bromsgrove Road Based Local and Strategic Passenger Transport Enhancement Scheme;
- Bromsgrove Local Bus Service Enhancement Scheme;
- Bromsgrove Town Centre Public Realm Enhancement Scheme;
- Development and Delivery of a Parking Management Strategy for Bromsgrove; and
- Bromsgrove Smarter Choices Programme.

In developing the list of schemes for the Bromsgrove District IDP, Halcrow has been mindful of the considerable work undertaken to develop the Bromsgrove transport package and has thus not sought to duplicate this work. It is noted that the pressure points on the network identified through the BTP process have been found to be consistent with those identified through this project. Hence, the list of transport infrastructure schemes included in the BTP have been included in the Infrastructure Delivery Plan. That is, with specific regard to the highway impact assessment work completed to inform this IDP, it is noted that the junctions identified through the modelling work are consistent with the BTP.

4.3 Bromsgrove Allocation Accessibility Study (January 2010)

A meeting was held with WCC officers' to gain an understanding of local issues and to draft a list of possible infrastructure requirements. This resulted in a list of sustainable transport schemes to support the Bromsgrove Development Plan proposals. The draft list of schemes was considered against the findings of the Accessibility Assessment of Bromsgrove completed in 2010 in order to finalise the list of sustainable infrastructure proposed through the Infrastructure Development Plan.

The assessment analysed accessibility by walk, cycle and passenger transport to key employment, health, education, retail and leisure destinations. The assessment concluded that accessibility is dependent on the destination type and the mode of transport. Most sites in Bromsgrove have good levels of access by cycle. However, more sites are considered to have poor levels of accessibility by walk compared to cycle, with the majority of sites in proximity to the rail station being classed a 'poor'. In terms of public transport, accessibility is considered more mixed across the town, with sites around the rail station and in the north of town being considered as 'good' and sites to the west of the town being considered as 'okay'.

Overall, the accessibility study claims public transport in the Bromsgrove area is recognised as 'poor' and especially in linking internal areas of Bromsgrove together and to the local centre and rail station. It was calculated that most of the Bromsgrove urban area is covered within a 15 minute catchment area, suggesting that cycling should be promoted wherever possible.

4.4 Spreadsheet Model Assessment of Bromsgrove

WCC commissioned Halcrow to produce a spreadsheet gravity model to assess the highway impact of potential new development sites within and on the edge of Bromsgrove. The spreadsheet helped inform discussion on the potential for mitigation measures.

It should be noted that the spreadsheet gravity model was developed for different purposes to the model developed for the purposes of the Bromsgrove IDP. Hence there is some difference in the methodology and input data used in the development of the two forms of assessment. However, a sense check between the models has been undertaken to ensure consistency between the proposed recommendations. The results indicate that no matter what methodology is chosen, a similar set of conclusions drawn to which highway junctions require investment in order to support the development proposed through the Bromsgrove Development Plan.

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5 Baseline and Do-Minimum Network Problems/Issues

5.1 Introduction

This section of the report provides an overview of the existing and predicted future, (with further development) performance of the transport network in Bromsgrove. The previous research undertaken into the identification of current and forecasting of future transport network performance for the purposes of the Bromsgrove Transport Package has provided a comprehensive database of problems and issues. This section of the report draws on that work.

5.2 Highway Network Performance

Analysis of the performance of the highway network across Bromsgrove, for the current year (2012) and a 2026 'do minimum' forecast year identify highway related problems and issues which adversely impact on Bromsgrove both now and in the future. These issues include the following:

- Significant congestion across the local highway network (particularly at peak times);
- Congestion along the A38 Bromsgrove Eastern Bypass and approaches to this route (in particular, New Road and Stratford Road approaches);
- Evidence suggests congestion issues arise from junction capacity issues rather than link capacity;
- School traffic contributes to network congestion, particularly in the AM peak period; and
- Air quality is deteriorating across the network. Stoke Heath (on the Bromsgrove Eastern Bypass) and M42, Junction 1 are classed as Air Quality Management Areas. Bromsgrove Town Centre, on Worcester Road, Market Street and Birmingham Road as borderline Air Quality Management Areas.

The BTP recommended a corridor enhancement scheme for the A38 Bromsgrove Eastern Bypass. The scheme would require significant investment in junction design and capacity at all junctions along the route from Upton Warren (located south of the town) to M42 Junction 1 (located north of the town). Any scheme should include enhancements to crossing opportunities to increase the efficiency of the corridor. Improvements to junctions across the Bromsgrove urban area are also recommended to improve the efficiency of traffic flow by providing sufficient capacity to cater for planned growth.

5.3 Public Transport and Sustainable Modes of Transport

Analysis of existing public transport provision and facilities for cyclists and pedestrians carried out for the purposes of the Bromsgrove Transport Package highlights a number of issues as discussed in the relevant sections below.

Public transport infrastructure and services

Traffic congestion on the highway network directly impacts on the punctuality, reliability and overall efficiency of strategic (inter-urban) and local bus services in Bromsgrove, particularly during peak hour periods. It is noted that bus stop infrastructure across Bromsgrove has deteriorated over time and has reduced the attractiveness of bus services in Bromsgrove.

In its existing form, the BTP reporting highlights that Bromsgrove railway station is not considered to be suitably designed for passenger use. Furthermore, the location of the rail station away from Bromsgrove town centre puts it at a disadvantage. From a service point of view, it is not currently served by frequent rail services, which as the consequence of directly impacting on the attractiveness of rail as a mode of travel to key destinations for residents of Bromsgrove.

The BTP notes that there is a perception that access to passenger transport information across Bromsgrove is poor. As a consequence of this, the attractiveness of bus and rail to access key services and destinations is reduced.

An Accessibility Assessment completed for Bromsgrove shows development sites in proximity to the railway station have high levels of good access to employment sites, all other sites are considered to have poor access to employment via public transport. Across the area there is a good spread of development sites which are considered to have good access to education and healthcare destinations via public transport services.

Walking and Cycle Infrastructure

The BTP states 'the quality of walking and cycling networks in Bromsgrove is particularly poor'. Reasoning behind this statement notes that the walking and cycling network is fragmented with limited signage and poor information for potential users. As a result, there is a perception walking and cycling is not an attractive alternative to using the car.

High traffic volumes across Bromsgrove, coupled with 'inadequate junction design and limited crossing opportunities' cause significant severance issues for pedestrians and cyclists. Key destinations for pedestrians and cyclists are spread across the geographical area of the town. For example the town centre and the railway station are located on separate sides of the key A38 highway corridor. Therefore, travel by sustainable modes of travel between these key destinations is not perceived as a viable mode choice.

Another factor contributing to the perception that walking and cycling are not seen as viable alternatives to the car is the deterioration of the public realm in Bromsgrove town centre. The BTP claims 'many of the transport corridors and in particular the town centre, are not attractive places to walk or cycle to, or through'.

The Accessibility Assessment work states that access to a range of destinations by cycling is good across the town. However, development sites located north and east of the A448 and A38 corridors are classed as having poor levels of access to all destinations due to the severance issues resulting from the geographical locations of the sites. In terms of accessibility to key destinations by walking, development sites located to the north and west of the town centre are shown to be the best performing, with 'good' access to all destinations.

Overall conclusion

In conclusion, the BTP states; 'focussing purely on one mode of transport (for example car) will not deliver sufficient decongestion and accessibility benefits to improve overall quality of life in Bromsgrove. It is strongly recommended that a multimodal investment approach is pursued, which will deliver enhanced transport choice for Bromsgrove's residents and visitors, as well as reducing congestion and improving quality of life'.

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6 Scheme Identification

6.1 Introduction

This section of the Technical Note sets out the mitigation measures identified as a result of the analysis of previous work and the model developed for this study. The mitigation measures have been presented in tabular form, with a description of location, issue, the mitigation proposed and cost.

The following sections set out the assumptions that have formed the basis of the scheme assessment and costs.

6.2 Scheme Identification Methodology

Where appropriate, the study has drawn on existing Transport Packages. For example, scheme proposals identified through the Bromsgrove Transport Package have been taken as the core schemes for Bromsgrove.

However, this study has identified additional issues in both Bromsgrove and the outlying towns as a result of the use of Vehicle/Trip Generation Model. Thus, further locations where mitigation is required to overcome or reduce the impact of proposed development have been identified. That is, there are locations outside Bromsgrove that do not currently have the benefit of an existing package of measures identified through the BTP strategy.

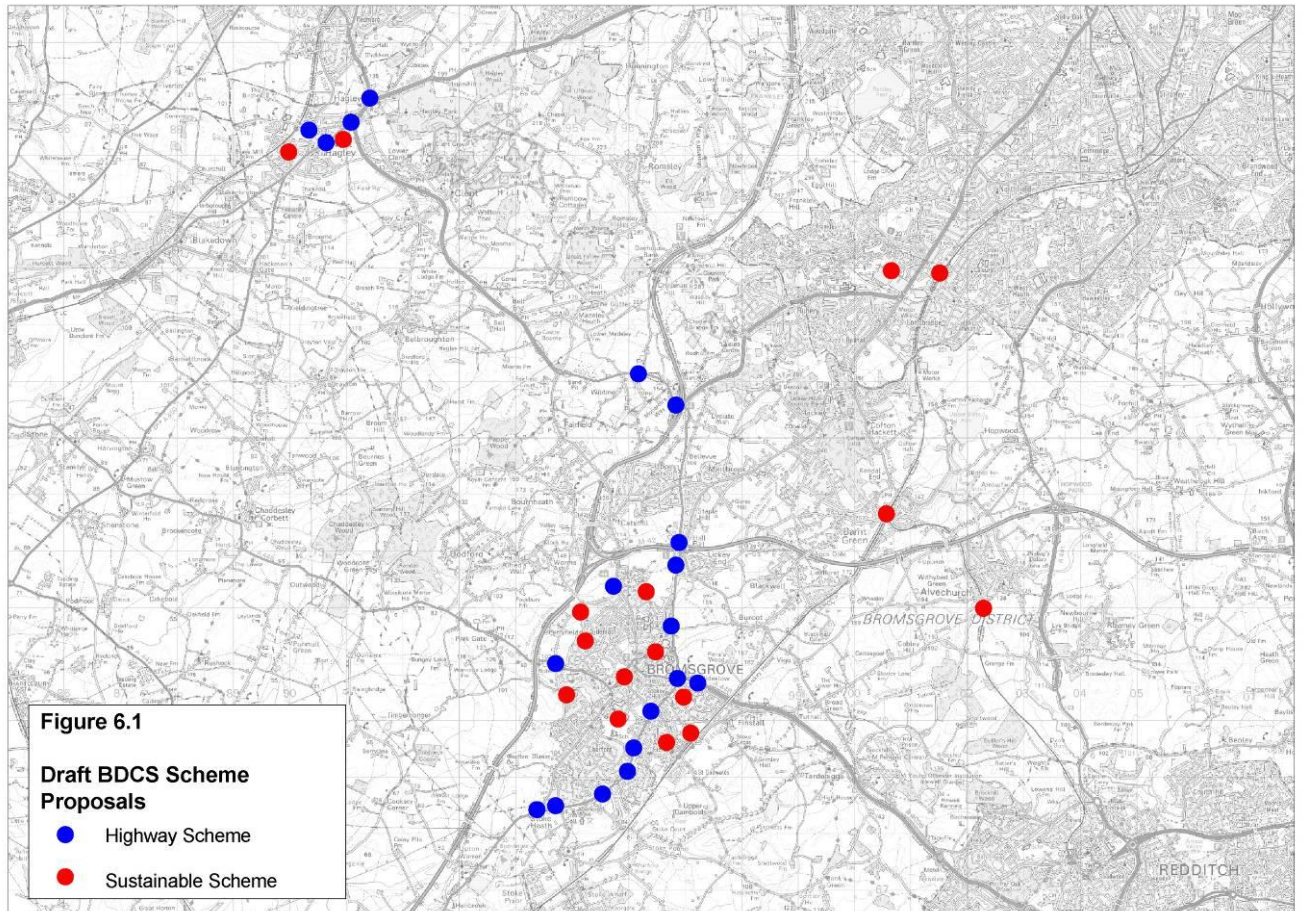
Furthermore, there are some development sites that were not considered at the time the LTP strategy was developed. For these sites, an additional task has been undertaken to identify schemes and other mitigation measures. As these development sites have not been previously subject to a transport assessment, schemes have been identified through the use of the Vehicle/Trip Generation Model.

Proposed transport schemes have been identified to mitigate against predicted future year transport issues. The proposed highway infrastructure schemes aim to improve capacity at key junctions which are predicted to incur additional delays in future years as a result of the housing and employment growth proposed for Bromsgrove District Council. These junctions have been identified through the use of the Vehicle/Trip Generation Model. The Vehicle/Trip Generation Model looks at the predicted forecast year traffic flows and compares these with the junction capacities on the identified links to calculate volume over capacity ratios. For more detailed information please refer to section 10 of the Modelling Assessment Tool Technical Note included as Appendix A of this report.

The proposed sustainable transport infrastructure schemes aim to connect the proposed BDCS development sites to the existing transport network and where appropriate improve the existing transport network to encourage greater use of more sustainable transport modes. These schemes have been identified through consideration of the results of the Vehicle/Trip Generation Model to determine where additional infrastructure is required to complete the sustainable transport network to support trips by sustainable modes to and from these development sites.

The proposed transport schemes are shown on Figure 6.1. These plans show the locations of the schemes identified as a result of the Vehicle/Trip Generation Model.

Figure 6.1. – Draft BDCS IDP proposals – Bromsgrove



Each of the proposed transport infrastructure schemes have also been considered against the following design considerations;

- Policy/Strategy – proposals have recognised the policies and strategies put forward through WCC's Local Transport Plan and to be consistent with the general approach to transport schemes in the area;
- Feasibility/Deliverability – consideration has been given to the deliverability of the proposed transport schemes. That is, the proposed schemes have considered potential land constraints, proximity to existing obstructions (e.g. Railway Lines), topography and overground services and utilities; and
- Design Standards and Guidelines – good practice design guidelines have been considered against all of the proposed transport schemes. Only schemes that could meet appropriate design guidelines have been proposed, subject to detailed design.

All of the proposed transport schemes have been priced using Worcestershire County Council rates.

6.3 Overview of Schemes

The different characteristics of locations within the BDCS area have been taken into consideration when identifying schemes. That is, though there is always an emphasis on the provision of sustainable alternatives, there is also an acknowledgement that the measures identified need to be appropriate for the journey being made and location of the start point.

In Bromsgrove a balanced approach has been adopted, identifying both highway and more sustainable measures. In the rural areas, whilst the use of sustainable modes is to be encouraged, it is acknowledged that highway capacity issues also need to be addressed to enable both car and bus trips to use the network efficiently.

6.4 Scheme Tables

The Scheme Tables are presented in Appendix D.

Cost estimates for each scheme were prepared primarily using construction rates used by WCC through the costing of schemes associated with the Worcester Transport Strategy (WTS). It should be noted that where some items fell outside the scope of the WTS, assumptions were made using costs incurred from other similar schemes carried out for other local authorities. Costs can vary considerably from site to site and supplier to supplier. More detailed cost estimates will be determined when the precise details of each scheme are known during further design stages. These uplifts are summarised in Table 6.1 (Highways) and Table 6.2 (Sustainable Modes)

Table 6.1: Uplifts to Highway Scheme base construction costs

Highway	
Preparation	12%
Supervision	5%
Evaluation	0%
Drainage	10%
Preliminary	5%
Site Supervision	5%
Design	10%
Services and Utilities	30%
Landscape	10%
Normal Road TM	10%
Strategic Road TM	20%
Groundworks/Earthworks	2%
Maintenance	25%
Consultation	10%
Ecology	10%

The uplifts included in Table 6.1 are based upon values used for WTS costing purposes and previous work for other local authorities.

These uplifts are calculated based on the construction cost and prior to the optimism bias being added. The uplifts cover the additional costs above and beyond the actual cost of construction. That being items including site preparation, site supervision and evaluation. A generic drainage cost is included along with design, landscaping and ecology. Different uplifts are applied for traffic management dependent on the local

road network, i.e. a greater allowance is provided for on the strategic highway network.

Table 6.2: Uplifts to Sustainable Mode base construction costs

Sustainable	
Preparation	0%
Supervision	2%
Evaluation	0%
Drainage	3%
Preliminary	5%
Site Supervision	3%
Design	10%
Services and Utilities	3%
Landscape	3%
Normal Road TM	2%
Groundworks/Earthworks	2%
Maintenance	5%
Consultation	5%
Ecology	2%

The uplifts for sustainable mode schemes are generally less than those applied for the highway schemes. This is because the proposed schemes are generally smaller schemes which are less intrusive and have fewer associated risks. Allowances for Ecology and Drainage are often less as the proposed schemes pose less risk to local environments meaning that SUDs and surface drainage can often be applied. The design uplift costs remain the same for both the highway and sustainable schemes.

The Optimism Bias is calculated by referring to 'The British Department for Transport Procedures for Dealing with Optimism Bias in Transport Planning Guidance Document – June 2004'. It is noted that all the uplift items have been added to the cost of construction prior to the 44% Optimism Bias Uplift. The Optimism Bias uplift is based upon the maximum applied rate for standard civil engineering works at this preliminary stage. This percentage, when applied, suggests an 80% probability of staying within the budget.

The cost estimates do not include Land Costs (if required).

7 Conclusions and Next Steps

7.1 Conclusions

The report has set out the context, methodology and tabulated results of a strategic assessment of the impact of development proposals in the BDCS. The schemes identified have been chosen based on the degree to which additional demand to travel impacts on the surrounding road network and the policy and design requirements of central and local government.

The list is comprehensive, but contains no very major proposals to accommodate the increase in demand. Hence, there is an expectation that some change in mode share will occur as a result of increased attractiveness of more sustainable modes, as well as increased congestion on the highway network.

It is noted that the scale of infrastructure proposed is significantly less than that which has been introduced to the network over the past 20/30 years. There are no new town bypasses, major improvements to inter-urban routes or new major river crossings. In terms of this exercise these schemes were considered against environmental and deliverability criteria as well as mitigation of transport impacts.

The schedule of schemes presented, and the associated costs, have taken into account the additional costs associated with scheme design and an allowance made for scheme maintenance over a 30 year period. These added allowances mean that if the scheme costs are simply compared to construction costs they appear high, but the additional costs have been derived through experience and represent the total cost to deliver the individual schemes.

Overall, the inputs provide a comprehensive schedule of infrastructure interventions to mitigate the transport impacts of the proposed BDCS development.

7.2 Potential future activities

This report has set out a comprehensive listing of infrastructure and public transport service requirements in order to mitigate against the impact of the new development proposals contained in the BDCS. These requirements have been identified through reference to policy statements and work to assess the impact of additional journeys on the highway network.

The work has been based on information on proposed developments as identified in the BDCS in summer 2012. It is recognised that this document has subsequently been the subject of consultation as a result of this there are likely to be changes going forward.

How will we deal with changes to development assumptions?

Under guidance from Planning Officers at Bromsgrove and Redditch Borough Councils, changes to the development assumptions for the area may be necessary in spring 2013. Such changes may be the inclusion of cross boundary development sites and the inclusion of an alternative development scenario. Assuming any changes to these assumptions fit the 'development clusters', as used in the Vehicle Trip Generation Model, any changes to these assumptions can be relatively easily incorporated into the model and the associated impact on the transport network

assessed. Halcrow proposes no action to update the model is undertaken until guidance is received from all of the three district councils.

Feeding viability assessments into the transport elements of the IDP and assessment of “priorities”

Halcrow could assist with the final wording to go forward into the IDP if required. We recognised that of the final document is structured in a different way, some assistance may be required to present our methodology and results in a consistent manner to other infrastructure requirements.

Phasing and delivery issues

Iterations between planning data and the transport infrastructure requirements. Which development sites are most likely to occur first?

The list of proposed transport schemes focuses on key transport corridors linking the major settlements in Bromsgrove District Council. The results of the modelling provide indications of the key schemes required to support each of the proposed development sites. A further piece of analysis work, using the Vehicle/Trip Generation Model, could be carried out to provide an assessment of the transport schemes required to support each of the development sites in turn. The schemes proposed through the existing study aim to meet the cumulative demands on the transport network. A further stage would be to provide a breakdown of the schemes required to support each of the development sites in turn. However, it should be noted in some cases justification of large schemes may be more difficult when considering individual development sites compared to the total cumulative impact.

Funding opportunities

This report has identified and costed a comprehensive schedule of transport infrastructure requirements. In providing these costs, no allowance has been made for any scheme that may already have funding secured, or schemes where funding has been allocated through LTP or other sources. An exercise could be undertaken to identify the potential funding sources for the remaining schemes.



Appendix A

Modelling Assessment Tool; Contents and
Description

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Appendix A Modelling Assessment Tool; Contents and Description

To be completed upon completion of the modelling of the cross boundary sites

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Appendix B

Bromsgrove and Redditch – Planning Data

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Appendix B Bromsgrove and Redditch – Planning Data

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Appendix C

Predicted number of trips from development sites by mode

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Appendix C Predicted number of trips from development sites by mode

To be completed upon completion of the modelling of the cross boundary sites

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Appendix D

Infrastructure Delivery Plan – Scheme Tables

Appendix D Infrastructure Delivery Plan – Scheme Tables

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