



Birmingham Development Plan

Transport Evidence Base: Scoping and Methodology Report

September 2012
Birmingham City Council

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1 Lancaster Circus, PO Box 14439, B2 2JE

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1. Introduction

1.1 Study Context

Birmingham City Council (BCC) is in the process of developing the Birmingham Development Plan (formerly known as the Birmingham Core Strategy), a central part of its Local Development Framework. As with any land use policy, the way the Birmingham Development Plan is supported by transport services and associated infrastructure will be one of the elements fundamental to its successful delivery. Similarly, the way in which the transport system develops to respond to the implementation of the Plan will also be fundamental to its ongoing effectiveness. For these reasons, and in accordance with relevant policy, BCC has commissioned Mott MacDonald to develop a Transport Evidence Base to support the emerging Birmingham Development Plan.

The purpose of this report is to present the scope of how we will undertake this study in order that consensus between stakeholders can be achieved from the outset on:

- Proposed study methodology (*how we're going to do the study*);
- Key study inputs (*what the study expects from stakeholders*); and
- Proposed study outputs (*what stakeholders can expect from the study*).

An outline of the proposed study methodology and consequent report structure is presented in the following sub-sections.

1.2 Outline Study Methodology

The primary aims of the Transport Evidence Base are to:

1. Assess the transport impacts of the Development Plan proposals, both positive and negative; and
2. Propose policy-compliant mitigations to address negative impacts where they occur.

The study is therefore essentially a policy-compliant assessment of transport impacts. The main stages of the proposed study methodology are therefore as follows:

Table 1.1: Proposed study stages

Study Stage	Label	Description
Stage 1	Scoping	Establishing and agreeing key study parameters from the outset (ie this report)
Stage 2	Establishing Context	Building up the full picture of relevant policy, plans and programmes which set the context for being able to assess the Birmingham Development Plan's future impacts
Stage 3a	Strategic Modelling	Assessing area-wide future impacts through strategic modelling
Stage 3b	Junction Modelling	Local area modelling of specific junctions and development of mitigation measures
Stage 4	Infrastructure Delivery	Considerations of design, cost, funding and delivery of required new infrastructure
Stage 5	EIP Assistance	Expert witness support to the Council at the Planning Inquiry

The key stage of the methodology is Stage 3a (Strategic Modelling) because this is the stage where the Birmingham Development Plan's transport impacts – both positive and negative – are quantified. The West Midlands Policy Responsive Integrated Strategy Model (PRISM) will be employed for this task and, in order to quantify impacts, will consider two scenarios:

1. Base year scenario – which represents a present-day transport and land-use scenario.
2. Future year scenarios – which represent the impacts of the Birmingham Development Plan on the future transport network so that appropriate mitigation measures can be identified.

The primary purpose of Stage 2 of the study is therefore to develop an understanding of these scenarios through a review of all relevant policy, plans and programmes with a view to providing an evidence-based context, as well as data, for the subsequent assessment stages.

1.3 Report Structure

To reflect the above proposed study methodology, this report is structured as follows:

Table 1.2: Report structure

Section	Title	Description
Section 2	Policy Context	A review of overarching policies which serve as frames of reference to guide the development of the Transport Evidence Base
Section 3	Baseline Conditions	A consideration of land use and transport data sources which lead to an understanding of Baseline conditions
Section 4	Future Land Use Conditions	A consideration of land use planning related data sources which lead to an understanding of future land use conditions
Section 5	Future Transport Conditions	A consideration transport data sources which lead to an understanding of future transport conditions
Section 6	Assessment Approach	A description of the proposed approach to modelling the impacts of the Birmingham Development Plan and identifying appropriate mitigation
Section 7	Summary	A summary of this scoping document, highlighting the main parameters requiring agreement

2. Policy Context

2.1 Introduction

The purpose of this section is to identify and briefly describe those policies which effectively serve as frames of reference – setting the tone – for the development of this study in the following three key areas:

- Planning policy
- Transport policy
- Transport appraisal guidance

2.2 Key Planning Policy

2.2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was introduced in March 2012. The introduction to the document states:

the National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities. The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied.¹

In the document Foreword, the Minister for Planning writes that:

sustainable development is about positive growth – making economic, environmental and social progress for this and future generations. The planning system is about helping to make this happen. Development that is sustainable should go ahead, without delay – a presumption in favour of sustainable development that is the basis for every plan, and every decision. This framework sets out clearly what could make a proposed plan or development unsustainable.

With respect to Local Plans, the document states that:

Local planning authorities should set out the strategic priorities for the area in the Local Plan. This should include strategic policies to deliver:

- *the homes and jobs needed in the area;*
- *the provision of retail, leisure and other commercial development;*
- *the provision of infrastructure for transport, telecommunications, waste management, water supply, wastewater, flood risk and coastal change management, and the provision of minerals and energy (including heat);*
- *the provision of health, security, community and cultural infrastructure and other local facilities; and*
- *climate change mitigation and adaptation, conservation and enhancement of the natural and historic environment, including landscape.*

¹ Department for Communities and Local Government (2012): 'National Planning Policy Framework'

The document goes on to state that:

Crucially, Local Plans should

- *plan positively for the development and infrastructure required in the area to meet the objectives, principles and policies of this Framework;*
- *be drawn up over an appropriate time scale, preferably a 15-year time horizon, take account of longer term requirements, and be kept up to date.*

With respect to supporting the Strategy with a robust evidence base, the document states that:

Local planning authorities should work with other authorities and providers to

- *assess the quality and capacity of infrastructure for transport, water supply, wastewater and its treatment, energy (including heat), telecommunications, utilities, waste, health, social care, education, flood risk and coastal change management, and its ability to meet forecast demands; and*
- *take account of the need for strategic infrastructure including nationally significant infrastructure within their areas.*

With respect to planning for Planning Inquiry, the document states that:

a local planning authority should submit a plan for examination which it considers is “sound” – namely that it is:

- *Positively prepared*
- *Justified*
- *Effective*
- *Consistent with national policy*

This is therefore the key policy document for setting the planning tone for the development of the Birmingham Development Plan and associated Transport Evidence Base.

2.3 Key Transport Policy

2.3.1 Delivering a Sustainable Transport System

The Delivering a Sustainable Transport System (DaSTS) report was issued by the Department for Transport (DfT) in 2008 as a follow-up to their 2007 report, ‘Towards a Sustainable Transport System’, which in turn was their response to the Eddington Study and Stern Review.² The DaSTS document outlined five goals for transport, *focusing on the challenge of delivering strong economic growth while at the same time reducing greenhouse gas emissions*. These goals were as follows:

- *To support national economic competitiveness and growth, by delivering reliable and efficient transport networks*
- *To reduce transport’s emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change*

² Sir Rod Eddington for the Department of Transport (2006): ‘The Eddington Transport Study’; Sir Nicholas Stern for HM Treasury (2006): ‘The Stern Review on the Economics of Climate Change’

- *To contribute to better safety security and health and longer life-expectancy by reducing the risk of death, injury or illness arising from transport and by promoting travel modes that are beneficial to health*
- *To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society*
- *To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment*

These goals still set the national agenda for developing the transport system.

2.3.2 Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen

This White Paper was issued by Government in January 2011. In keeping with the DaSTS goals, it presents the Government's vision for *a transport system that is an engine for economic growth, but one that is also greener and safer and improves quality of life in our communities.*³

This paper recognises that there are long-term measures which the Government is pursuing to reduce the carbon impact of transport, like rail electrification and the development of greener fuels and vehicles, but that shorter-term gains are more likely to be achieved at the local level of behaviour change. The paper therefore outlines a number of measures to release greater powers and funding opportunities to local authorities in order to help them realise travel behaviour change at the local level.

2.3.3 West Midlands Local Transport Plan 3

The West Midlands Local Transport Plan is a statutory document which sets out: *a transport strategy for the West Midlands Metropolitan Area, delivered by prioritised transport interventions, which will support private sector led growth, sustainable economic activity and development, and support moves to a low carbon economy.*

The Plan is based on five key policy-compliant objectives as follows:

- *Underpinning private sector led economic growth and regeneration*
- *Tackling climate change*
- *Improving public health and safety*
- *Tackling deprivation and worklessness*
- *Enhance well being and quality of life*

The Plan consists of:

- A 15-year Local Transport Strategy, with detailed supporting appendices; and
- An Implementation Plan setting out how the Strategy will be delivered over 15 years

This therefore covers a similar timeframe to the Birmingham Development Plan. More details on the measures proposed by the Plan are presented further below.

³ Department for Transport (2011): 'Creating Growth, Cutting Carbon: Making Local Sustainable Transport Happen'

2.3.4 Birmingham Low Carbon Transport Strategy Consultation Draft

Birmingham's Low Carbon Transport Strategy consultation document was launched October 2011.⁴ The document states that the Strategy:

... has been developed to help address the City's overarching target to reduce CO₂ emissions per capita by 60% from 1990 to 2026 ... The vision is to reduce the environmental impact of the city's mobility needs by providing an efficient, safe, easy to use LOW CARBON transport system which will stimulate economic growth by providing high quality transport choices for the people of Birmingham.

This vision will be delivered through the four key themes of:

- Smarter Choices
- Smart Infrastructure
- Smarter Technology
- Effective Carbon Management Planning

This strategy provides a local expression of the aims outlined in the above national and regional policies / plans and thus reinforces the frame of reference within which the Transport Evidence Base must be developed.

2.4 Transport Appraisal Guidance

2.4.1 WebTAG

Advice on transport modelling and appraisal is provided by the DfT. Transport Analysis Guidance - WebTAG is the Department for Transport's website for guidance on the conduct of transport studies. This includes advice on how to create a transport model and advice on the modelling and appraisal appropriate for major highway and public transport schemes. The guidance should be seen as a requirement for all projects or studies that require government approval. For projects or studies that do not require government approval, WebTAG serves as a best practice guide.

2.4.2 Guidance on Transport Assessment

This DfT document was released in 2007 to provide updated guidance on the preparation of Transport Assessments to support land use development. The guidance also has a section advising on the assessment of spatial plans. It states that:

LPAs may seek to use existing regional, sub-regional, or local transport models where available and/or to undertake their own separate assessments of the transport impacts of alternative strategies in emerging core strategy DPDs.

It also goes on to say that: *Whilst it is recognised that the development and use of transport models can require significant resources, the benefits cannot be underestimated. It will be for authorities to decide*

⁴ Birmingham City Council (2011): 'Birmingham's Low Carbon Transport Strategy 2011+: Consultation Draft (October 2011)'

whether transport modelling is most appropriate and useful in their area and, if so, at what level, having regard to the requirement for a robust and credible evidence base.⁵

⁵ See: <http://www.dft.gov.uk/publications/guidance-on-transport-assessment/>

3. Baseline Scenario

3.1 Introduction

The purpose of this section is to identify those planning and transport information sources which will be used to build up a picture of today's Baseline Scenario. This will include an overview of present land and transport usage characteristics and an understanding of current transport challenges.

3.2 Planning Data

The West Midlands has a wealth of planning and socio economic data that is available to inform the evidence base for the Birmingham Development Plan.

Each year data is collected by Mott MacDonald from the West Midlands local authorities including numbers of housing, retail, leisure, employment land, offices and hotels. This data is originally derived from planning applications and provided by each local authority. To inform the baseline scenario, the above sources and data from other sources, including but not limited to Employment (Business Register and Employment Survey), Population (Office for National Statistics), Census data and Indices of Multiple Deprivation, will be used to understand existing conditions and to identify challenges.

PRISM also utilises planning data in its demand model from the sources identified above including:

- Population
- Jobs
- Enrolments

Further planning documents that will be reviewed for the evidence base include:

- Strategic Housing Land Availability Interim report
- Strategic Housing Market Assessment
- Settlement Studies
- HCA Business Plan

3.3 Transport Data

The West Midlands has a wealth of existing quantitative evidence available to inform the Birmingham Development Plan. This section provides a summary of available evidence to be used to inform the Birmingham Development Plan.

3.3.1 West Midlands Local Transport Plans

West Midlands Local Transport Plan 2 (2006 to 2011) provides quantitative evidence collected each year to monitor against targets including:

- Road congestion
- Traffic flows to urban centres
- Public transport trips to urban centres
- Road traffic mileage
- Air quality
- Access to employment and health

- Road accidents
- Cycling
- Travel plans
- Bus patronage and punctuality
- Light rail use
- Personal security.

West Midlands Local Transport Plan 3 (2011 – 2026) will continue to provide key evidence against the following targets:

- Journey time reliability
- Bus reliability
- Road congestion
- Road maintenance
- Total road traffic
- Bus patronage
- Active travel and travel to school;
- Public transport trips to centres
- CO2 emissions from transport
- Air quality
- Road accident casualties
- Safety and security on public transport.

3.3.2 West Midlands Cordon Survey Reports and 1500 Point Survey Reports

Mott MacDonald, on behalf of the West Midlands Local Authorities, undertake cordon surveys at the nine LTP centres every 2 years. These cordon surveys include traffic count information on the roads into each centre over a two week period in the relevant year. This data is further supplemented by a manual count to record vehicle classification and occupancy. The Birmingham cordon reports are available for the years 1999, 2001, 2003, 2005, 2007, 2009 and 2011.

Mott MacDonald also undertakes 1500 automatic traffic surveys every two years across the West Midlands to provide information on trends in traffic flows for the West Midlands Local Authorities.

3.3.3 National Networks - Access to Birmingham Study

This study was undertaken to support the Department for Transport (DfT) in delivering a sustainable transport system. This study provides a review of the available quantitative evidence to support the following outcomes:

- Supporting national economic competitiveness and growth, by delivering reliable and efficient transport networks; and
- Reducing transport's emissions of Carbon Dioxide (CO₂) and other greenhouse gases, with the desired outcome of tackling climate change.
- Contribute to better safety, security and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health;
- Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society; and
- Improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.

The data used to underpin this report is all publicly available and includes but is not limited to employment density, indices of multiple deprivation, congestion and vehicle delay, rail load factors, accessibility by public transport to Birmingham City Centre and freight data.

3.3.4 Transport Innovation Fund

The Transport Innovation Fund (TIF) documents (Tackling Congestion, Delivering Growth, 2008) provide quantitative evidence to support the case for road user charging in Birmingham city Centre. The reports detail the results from the PRISM modelling of the scenario.

3.3.5 West Midlands Regional Spatial Strategy Annual Monitoring Reports

Although the West Midlands Regional Spatial Strategy has been abolished the annual monitoring reports from 2004 to 2009 contain data which could be useful to provide background information on trends to the Birmingham Development Plan. The reports include information on:

- School travel mode
- Walking and cycling
- Public transport
- Car parking
- Speeds and delays
- Freight.

3.4 Transport Challenges

3.4.1 West Midlands Local Transport Plan 3

As part of the development of the current Local Transport Plan (LTP), a public consultation exercise was undertaken to identify the public's perception of the key areas requiring priority within the LTP. The top ten issues were:

1. Environmental and carbon reduction/emission issues
2. Improve safety and security on public transport
3. Improve bus service frequency/routes/reliability/fares
4. Road based public transport issues (capacity/reduce congestion/bus priority measures)
5. Improve accessibility of public transport for less able users/social inclusion
6. Improve/extend/reopen rail and metro lines
7. Development of technology to lower carbon emissions / new modes of transport e.g. rapid transit
8. Importance of sustainable development/land use
9. Strategic fit/economic benefit of LTP in wider perspective
10. Improve links with key areas, new housing, business parks etc

This order of priorities shows a good fit with current national policy priorities.

In the LTP document itself, the following are cited as representing the main transport challenges currently facing Birmingham:

- Influencing and preparing for High Speed Rail
- Maximising the benefits of the redevelopment of New Street Station, by improving accessibility and connectivity

- Progressing the runway extension at Birmingham Airport (BHX) and associated improvements to the A45 transport corridor
- Public transport improvements by all modes from Birmingham City Centre to BHX, including rapid transit connections
- Midland Metro extensions in Birmingham City Centre and new rapid transit lines in appropriate high volume corridors
- Addressing congestion on the motorway network and the consequent impact on the Primary Route Network, including dealing with the effects of congestion on the M42, particularly at junctions serving BHX and the NEC

4. Future Land Use Conditions

4.1 Introduction

The purpose of this section is to identify those land use planning sources which will be used to build up a picture of future land use conditions, with and without the Birmingham Development Plan.

4.2 National and Regional Land Use Forecasts

The DfT operates a planning based National Trip End Model (NTEM) which includes forecasts for population, employment, households, car ownership, trip ends and trip rate factors. Through the associated software tool, TEMPRO, this allows multi-modal traffic growth forecasts to be made on a national, regional and local level.

In addition to the TEMPRO resource, Regional Assemblies produced Regional Spatial Strategy land use forecasts which, although abolished, still provide the most robust planning forecasts available at this time.

4.3 Relevant Local Planning Documents

4.3.1 Birmingham Local Development Scheme

The Birmingham Local Development Scheme identifies the planning documents being developed within the Local Development Framework and their timescale for completion. The Scheme covers a Framework development period of 2011 to 2014.

4.3.2 Previous Draft Birmingham Core Strategy

The present emerging Birmingham Development Plan supersedes the previous draft strategy issued in 2010. The aims of the previous strategy were as follows:

- Sustainable growth
- A vibrant global city
- High quality of life and a sense of place
- An innovative and connected city

4.3.3 Area Actions Plans

Birmingham City Council has three Area Action Plans which set out the land use framework and proposals for the regeneration of three areas as follows:

- Longbridge
- Aston, Newtown and Lozells
- Bordesley Park

These plans set out a development framework for these areas for the next 15 to 20 years and will be incorporated into the Birmingham Development Plan. Details on the transport implications of these plans are presented below in Section 5.2.3.

4.3.4 Birmingham Big City Plan

Launched in 2010, *the Big City Plan City Centre Masterplan is being produced as a non-statutory planning and regeneration framework for Birmingham's city centre.*

In summary, the Plan:

- Prioritises those areas that will grow the City Core by 25%, delivering space for over 1.5 million square metres of new floorspace, over 50,000 new jobs and contributing £2.1 billion to the economy each year.
- Identifies key projects to deliver over 65,000 square metres of new and improved public spaces and 28 kilometres of enhanced walking and cycling routes.
- Sets out a movement framework transforming connectivity.
- Identifies how the city centre population will be grown by providing new housing, including over 5,000 new homes in the areas of transformation to attract more families to live in the city centre.
- Explores the evolution of land uses and activities, locations for tall buildings and the role of heritage.
- Sets out visionary proposals for each of the city centre quarters.
- Fully integrates both sustainable development and addressing the impact of climate change as part of the future transformation of the city centre.

The aim of the Masterplan is *to create a world-class city centre by planning for the next 20 years of transformation*, while it is intended that *the key principles of the Masterplan will be embedded in the Council's Development Plan.*

4.3.5 Supplementary Planning Documents: Shopping and Local Centres

Adopted in March 2012, the purpose of this Supplementary Planning Document is to: *set out the detailed policies that will apply to both encourage new investment into centres and to protect and enhance their vibrancy and viability.*

The SPD recognises a need to balance the provision of retail and non retail uses to:

- Maintain the primary retail function of centres,
- Prevent an over concentration of non retail uses, and
- Ensure that proposals resulting in a loss of retail do not have a negative impact on the viability and vitality of existing centres.

The document states that this SPD *has therefore been prepared to help address the specific challenges that are being faced by Birmingham's 70 local centres and to ensure that they can continue to provide a balance of functions and services.*

4.3.6 Supplementary Planning Document: Car Parking

The purpose of this document is *to set out the car parking standards which the City Council will apply when considering planning applications for new development.* It aims to ensure that:

- The access needs of new developments are properly provided for;
- A balance is struck between the needs of different road users;
- The impact of new development on congestion is minimised; and
- Birmingham continues to be an attractive place for new investment and development.

This SPD was adopted in February 2012.

4.4 Land Use Implications of Emerging Birmingham Development Plan

The above documents provide some of the context, content and constraints for the emerging Birmingham Development Plan. They also provide a framework for understanding future land use conditions for the 'without Development Plan' assessment scenario. However, it is the outputs of the emerging Plan which will be the main determinants of the future 'with Development Plan' land use assessment scenario to be considered by this study, and this is considered further in Section 6.5.3 below.

5. Future Transport Conditions

5.1 Introduction

The purpose of this section is to identify those transport information sources which will be used to build up a picture of future land use conditions under the Birmingham Development Plan.

5.2 Area-Based Transport Proposals / Schemes

5.2.1 West Midlands Transport Delivery Plan and Regional Transport Priorities

These two documents, issued by the now disbanded West Midlands Regional Assembly, reported progress on the implementation of regional schemes and also identified the top priority schemes. Although these documents are largely superseded, the top priority schemes are still being pursued by the relevant agencies. The latter were presented as:

- Birmingham New Street Station
- Birmingham International Airport - runway extension and surface access
- M6/M5 capacity improvements and Motorway Box Active Traffic Management
- Rail Freight Upgrades - Peterborough and Southampton to Nuneaton
- Regional Rail Capacity, both for passengers services and strategic freight connections
- Black Country 'strategic transport spine' (rapid transit)
- North Staffordshire Integrated Transport
- New Growth Points/ Settlements of Significant Development
- Smarter Choices

5.2.2 West Midlands Local Transport Plan 3 – Implementation Plan

In accordance with the objectives of the LTP, this Implementation Plan *focuses on transport interventions that support growth through:*

- *Prioritising investment on those interventions which will have greatest economic benefit*
- *Improving the delivery of our transport priorities*
- *Effectively maintaining and managing our transport assets*
- *Enhancing the efficiency, and reliability of our transport networks for the movement of people and freight*
- *Improving safety and security*
- *Promoting low carbon corridors and Smarter Choices to influence travel behaviour*
- *Developing an integrated public transport network, including Smartcar*

The Implementation Plan covers a wide range of specific transport measures, grouped into ten Long Term Themes. These proposed schemes provide a large part of the picture required to construct the Do-Minimum Scenario.

5.2.3 Area Action Plans – East, North West and South

Birmingham has three Area Action Plans (AAPs) which form part of Birmingham's Local Development Framework (LDF). The three AAPs are:

- Aston, Newtown and Lozells (North West);
- Bordesley Park (East); and

- Longbridge (South).

The Aston, Newtown and Lozells AAP sets out how the area could grow and develop over the next 15 years. It identifies areas for housing regeneration, new retail and commercial growth. It also identifies a proposal for a major employment area at East Aston (Regional Investment Site).

The Bordesley Park AAP sets out how parts of Washwood Heath, Bordesley Green, Bordesley Village and Small Heath could grow and develop over the next 15 years.

The Longbridge AAP sets out the land use framework and proposals for the regeneration of the former MG Rover plant site at Longbridge. The proposals include:

- 10,000 jobs;
- Over 1,450 new houses;
- A new local centre; and
- a series of public transport and highway improvements

These AAPs will need to be revisited with Birmingham City Council to ensure that future proposals are still consistent with those outlined in these documents.

5.2.4 Birmingham City Centre Vision for Movement

In order to support the Birmingham Big City Plan, a corresponding Vision for Movement transport strategy has been developed. As stated in the document, *The Vision will support the economic growth and development aspirations set out in the Big City Plan and provide an attractive and convenient travel experience. The resulting Strategy will contribute towards the development of Birmingham's Core Strategy currently being prepared by Birmingham City Council.*

The Vision is based on the three priorities, as follows:

- A well connected city
- An efficient city
- A walkable city

Under these three priorities, a framework of aspirations and guidelines is presented to steer the future development of the city centre transport network.

5.3 Mode-Based Transport Proposals / Schemes

5.3.1 Public Transport

5.3.1.1 Integrated Public Transport Prospectus

Centro's Integrated Public Transport Prospectus sets out a 20 year vision for a *world class integrated public transport network for the West Midlands Metropolitan Area and the wider journey to work area*. It was developed in order to inform the public transport strategy of LTP3 and: *therefore promotes a public transport network which will reduce congestion and achieve wider environmental and social benefits. It will:*

- Enable a modal switch to public transport, for some journeys at congested times
- Expand bus and rapid transit networks

- *Add significant capacity to the rail network*
- *Be accessible to all sections of the West Midlands population⁶*

The document presents a range of integrated proposals for all public transport modes and service types.

5.3.1.2 Integrated Passenger Information Strategy

Related to the above vision of creating a *world class public transport system* is Centro's Integrated Passenger Information Strategy. This short document describes the improvements which Centro propose to make so that public transport customers can have access to better information. The document proposes the following improvements:

- Accurate and up-to-date digital information
- Improved on the vehicle information
- Increased information facilities at bus stations, stations and interchanges
- Improved use of social media and phone apps
- Better web-based information
- Timetable improvements, on the vehicle and at stops / stations
- Improved call centre service
- Information for all types of user groups

5.3.2 Bus

5.3.2.1 Green Light for Better Buses

Following its White Paper, 'Creating Growth, Cutting Carbon', the Government recognises the potential of the bus in helping them realise their vision of a *safe, green and sustainable transport system that will drive economic growth and improve quality of life for all*. Launched in March 2012, 'Green Light for Better Buses' presents the Government's proposals for reversing the decline in bus use across the UK and improving the passenger's experience and value-for-money.

The document sets out a package of measures that will: *allow local transport authorities and commercial bus service operators to be efficient, innovative and creative in coming up with joint solutions to the transport needs of local people*. The Government therefore commits to:

- *Reform the way in which we pay Bus Service Operators Grant (BSOG), a subsidy to operators that makes more services viable, to ensure taxpayers get better value for the money we put into each and every local bus market*
- *Incentivise partnership working between local transport authorities and operators to improve the quality of bus services and attract more passengers*
- *Improve competition in English local bus markets, and bring local transport authorities and bus companies together to help develop effective multi-operator ticketing schemes, by adopting the Competition Commission's recent recommendations to Government and*
- *Support local transport authorities in their ability to procure non-commercial services, including more flexible, innovative options such as community buses.*

⁶ See: http://www.centro.org.uk/corporateinformation/Integrated_Public_Transport_Prospectus.aspx

The implications of this paper for the West Midlands are focussed upon potential supported growth in the bus market.

5.3.2.2 Transforming Bus Travel

The opening statement of this Centro document states:

This document sets out how, with partners, we can improve the quality of bus travel in the West Midlands through a passenger focused transformation.

The core purpose of the document is stated as:

To get more people to travel by bus by providing passengers with a total quality journey experience that make buses the mode of choice and a realistic alternative to the private car.⁷

In order to address the requirements of current and future passengers, Transforming Bus Travel proposes a comprehensive package of measures that will improve all aspects of the bus product. These are detailed under the following headings:

- Network Modernisation
- Complementary Travel Services
- Bus Priority Improvements
- Total Quality Journey Experience
- Marketing and Promotion

This strategy therefore has the potential to lead to growth in the bus market in the West Midlands.

5.3.3 Rail

5.3.3.1 Reforming Our Railways

Published in March 2012, 'Reforming Our Railways' presents the Government's plan to reform the rail industry in order to increase efficiency and deliver greater value to the passenger. The paper is partly in response to an earlier study which identified *inefficiencies worth £2.5-£3.5 billion that are being paid for by passengers and taxpayers*. The document therefore proposes means by which the efficiency gap can be closed, while also meeting goals for growth and reduced environmental impact.

The future implications of this Paper are an improved rail passenger experience and therefore potential future growth in this market.

5.3.3.2 High Speed Rail: Investing in Britain's Future

In January 2012, and after a lengthy and widespread consultation process, the Government announced its decision in favour of a High Speed Rail network (labelled HS2) linking London and the HS1 line to the West Midlands, Leeds and Manchester (known as the 'Y network'). The benefits cited for the project are:

⁷ See: <http://www.centro.org.uk/bus/transformingbustravel.aspx>

- Significantly reduced overland journey times between centres, with trains being able to travel at 225 mph, with potential to increase to 250 mph in future.
- Release of capacity on conventional lines, with benefits for local and freight services.
- Regeneration and new employment opportunities around stations.⁸

The scheme will result in the recommissioning of Birmingham's former Curzon Street station, bringing much needed regeneration to this Eastside part of the city. The route between Birmingham and the capital is proposed to be operational by 2026.

5.3.3.3 Strategic Rail Freight Interchange Policy Guidance

In the interim while the National Networks National Policy Statement is being developed, this document (issued in November 2011) presents the Government's policy with respect to strategic rail freight interchanges (SRFI). The document states that the main objectives of Government policy for SRFI's are to:

- Reduce road congestion;
- Reduce carbon emissions;
- Support long-term development of efficient rail freight distribution logistics; and
- Support growth and create employment.

The document goes on to confirm that:

Government aims to meet these objectives by encouraging the development of a robust infrastructure network of Strategic Rail Freight Interchanges, and that: while it is for the industry to identify potential SRFI sites to meet commercial logistics requirements, and to take forward development proposals, for the reasons summarised above, the Government supports the development of a national network of SRFIs and will seek to facilitate the achievement of this objective.⁹

The implications of this policy for the West Midlands are focussed around the potential for future expansion of the rail freight market.

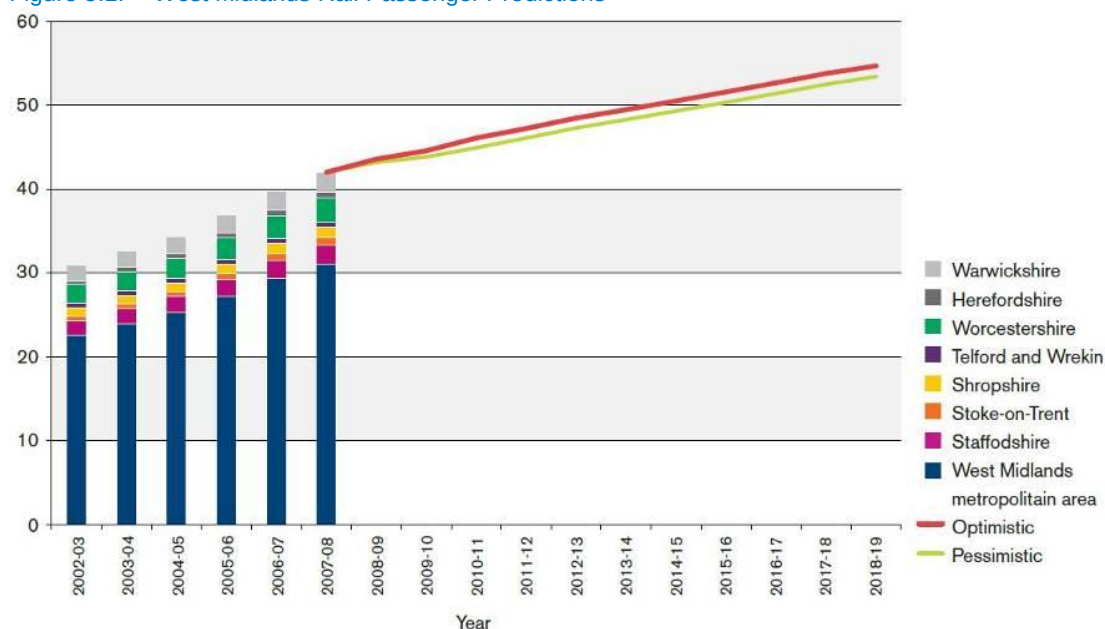
5.3.3.4 West Midlands Rail Development Plan

The West Midlands Rail Development Plan was issued in June 2009 by the West Midlands Regional Assembly in response to 'rail capacity' being identified as one of the themed priorities in the earlier Transport Priorities Action Plan. It builds on the work carried out by Centro in their 2007 document, 'Rail Network Development Strategy'. The Development Plan was therefore intended to *provide the whole of the West Midlands region with a single focus for rail development, benefiting both passengers and freight users*. The expected rise in passenger numbers is summarised in Figure 5.1 below.

⁸ Department for Transport (2012): 'High Speed Rail: Investing in Britain's Future' See: <http://www.dft.gov.uk/publications/hs2-governments-decisions/>

⁹ Department for Transport (2011): 'Strategic Rail Freight Interchange Policy Guidance'. See: <http://www.dft.gov.uk/publications/strategic-rail-freight-interchange/>

Figure 5.1: West Midlands Rail Passenger Predictions



Source: West Midlands Rail Development Plan June 2009

The Plan identifies the National Rail schemes relevant to the West Midlands which are included in the five year business plan (Control Period 4) released in March 2009. These schemes relevant to Birmingham, which should be considered in any future analysis, include:

- Birmingham New Street gateway project;
- West Midlands platform lengthening;
- Westerleigh – Barnt Green line upgrade; and,
- Wrexham to London Marylebone journey time improvements.

The Plan promotes 12 schemes for increasing capacity and improving journey times, of which the Birmingham Central Area Capacity Improvements and the Longbridge Transport Hub directly apply to the study area.

Beyond the 2014 time period it is expected that the West Midlands and Chilterns Route Utilisation Strategy will make a series of recommendations for the period 2014 to 2019. The draft version of the report is expected to be published in November 2010. The baseline data collected for the strategy study includes passenger capacity and travel time information. This data will be used to inform the study as appropriate.

5.3.4 Smarter Choices

5.3.4.1 Alternatives to Travel: Next Steps

This document was released by DfT in November 2011 and is both a challenge to companies to reduce unnecessary reliance on travel and a call for evidence of success stories. The rationale of the document is that our reasons for not making more use of alternatives to travel are not because the technology is unavailable but because we are not prepared to risk trying new ways of working. The report therefore sets

out how the Government is seeking to lead this much-needed revolution by example, while also presenting best-practice examples from around the country which others can follow.¹⁰

The document reinforces the Government's commitment to the Smarter Choices agenda and indicates the expectations to see the impact of this commitment on actual travel patterns over the next 10-20 years. This factor needs to be taken into account in any strategic modelling representation of the future (something which the West Midlands PRISM model is able to do – see Section 6 below).

5.3.4.2 Smart Network, Smarter Choices – Local Sustainable Transport Fund Proposals

In June 2011, Centro and the West Midlands local authorities submitted to DfT a bid for Local Sustainable Transport Fund support of their 'Smart Network, Smarter Choices' programme. Following a revised business case, DfT awarded the West Midlands £33.4m of investment in June 2012. The proposed programme applies to the next three years to 2015 (however legacy impacts are likely to be felt for a much longer timescale). The proposals are wide ranging and include Smarter Choices measures, technology showcase and infrastructure measures. The programme aims to deliver against key Government objectives by achieving the following positive impacts for the area:

- Reducing CO2 emissions by around 10,000 tonnes in the peak year of impacts.
- Increasing bus use by around four million trips annually.
- Cycling boosted by more than two million trips per year.
- Midland Metro use up by more than fifty thousand trips in the average fund year.
- Rail trips rising by over 500,000 in the final year of the fund.
- Walk trips increasing by around 10 million annually.

As a key driver for economic growth, the Smart Network, Smarter Choices programme aims to deliver a more sustainable approach to travel by reducing carbon emissions relating to the ongoing success of the West Midlands region.

5.3.5 Freight

5.3.5.1 West Midlands Regional Freight Strategy

As a follow-on the West Midlands Regional Transport Strategy, in 2007 the now-disbanded Regional Assembly published the West Midlands Regional Freight Strategy. The strategy provides a forecast of future freight demand and potential problems and proposes an action plan for road, rail, air and inland waterway freight modes. This document is currently being re-written by Centro on behalf of the region, but is not expected to be completed before the Birmingham Development Plan document.

5.3.6 Aviation

5.3.6.1 Draft Aviation Policy Framework

In July 2012, the DfT launched a consultation on their Draft Aviation Policy Framework document, which seeks to establish Government policy for the development of the aviation sector. The document recognises the positive role which the aviation industry plays in supporting the growth of the economy, but

¹⁰ Department for Transport (2011): 'Alternatives to Travel: Next Steps'

also identifies the environmental cost of air travel. The framework therefore seeks a way forwards which encourages further growth of the sector while at the same time limiting its noise, carbon and land-take impacts.

5.3.6.2 Birmingham Airport Master Plan

The Birmingham Airport Master Plan proposes a framework for airport development as far as 2030, with a view to both promoting and accommodating growth and achieving the airport's aim to be the *number one regional airport in Europe*.

The stated specific aims and objectives of the Master Plan are to:

- *Illustrate how the further development of Birmingham International Airport is consistent with national, regional and local policies.*
- *Provide a framework for the sustainable development of Birmingham International Airport:*
 - *setting out the prospects for growth in air traffic to 2030.*
 - *identifying the new airfield, passenger terminal and associated ancillary facilities which can best accommodate the forecast growth in air traffic to 2030.*
 - *identifying the areas of land outside the Airport's current boundaries which will be required for the future development of the Airport.*
- *Assess the surface access implications of the further development of Birmingham International Airport and facilitate the development of a sustainable, multi-modal surface access strategy for the Airport, in conjunction with other agencies, stakeholders and surface access providers.*
- *Outline the Airport Company's overall approach to sustainability and its proposals for environmental mitigation measures.*
- *Inform, and provide, a basis to address the needs of Birmingham International Airport, and its proposed further development, within the statutory Development Plan process.¹¹*

5.3.7 Non-Mechanised Modes

5.3.7.1 'Visions – Steps to the Future' A Walking Strategy for Birmingham

The Visions document identifies objectives to encourage walking in Birmingham:

- To reduce the amount of short journeys made by private car through encouraging a modal shift to walking.
- To set out the role that walking can play in meeting the transportation needs of residents and visitors.
- To assist in meeting health improvement targets by developing walking as a key public health initiative.
- To promote the role of walking for leisure, environmental and personal security benefits.
- Through a linked action plan, to assist in the delivery of city and national strategies.
- To propose a methodology for setting targets, monitoring progress and reviewing achievements.

¹¹ See: <http://www.birminghamairport.co.uk/meta/about-us/planning-and-development/airport-master-plan.aspx>

5.3.7.2 Bike Birmingham Strategy 2011

Bike Birmingham, aims to provide a workable strategy to encourage more cycling in Birmingham. It includes recommendations and actions to demonstrate Birmingham's commitment to promoting and developing cycling.

5.4 Further Transport Measures to Accommodate the Birmingham Development Plan

Determining what further transport measures are required to both accommodate and mitigate for the aspirations of the Birmingham Development Plan will be one of the main outputs from the modelling exercise, which is described in more detail in the next section.

6. Assessment Approach

6.1 Introduction

The previous sections have considered the policy framework that sets the tone for this study, and the various information sources which help build a baseline and future year picture of Birmingham's land use and transport context.

The purpose of this section is to describe the methodology by which the future transport impacts of the Birmingham Development Plan will be assessed through a policy-compliant modelling process.

6.2 Methodology Overview

The proposed modelling methodology is in accordance with DfT WebTAG guidance (see Section 2.4.1 above). WebTAG is a requirement for all multi-modal modelling studies that require government approval.

PRISM, the West Midlands strategic model, will be used to represent land use and travel conditions in the base year and in a future year with the Birmingham Development Plan in place. The outputs of the strategic modelling will provide an overview of the traffic flows and the scale of change that is expected in future year scenarios. These outputs can be used to compare the impacts of developments, potential mitigations and the transport implications at a strategic level.

The modelling of future scenarios will strengthen the evidence base a) on the relative success that can be anticipated of alternative futures in the Birmingham Development Plan and b) of remaining pinchpoints or hotspots that would need remedial measures (on the road and public transport networks).

PRISM will also be able to provide a percentage or absolute *change* in demand and examination of capacity on key strategic transport links and routes in the Birmingham Development Plan study area.

However, the model outputs are not suitable for detailed analysis of individual junctions. We therefore propose using the PRISM model outputs to understand the change in trip patterns and impacts at individual roads and junctions. Further modelling using standalone modelling packages will be undertaken as part of latter stages to inform Birmingham City Council and other stakeholders about when parts of the network will cease to be operational in future.

6.3 About the PRISM Model

Since 2004 the West Midlands has benefited from the use of PRISM – a state-of-the-art transport model covering the whole region. The model supports metropolitan and regional strategy development and decision making for land use, transport policy major scheme design and financing across all relevant transport modes.

PRISM has been developed by Mott MacDonald and RAND Europe, derived from earlier designs for cities such as Copenhagen, Paris and Sydney. What makes PRISM unique and original is that the individual traveller is the decision-maker. Forecasts take into consideration not only overall changes in population,

employment and infrastructure / service provision, but also the changing composition of the West Midlands travelling public. Further details can be found in PRISM: An Introductory Guide.¹²

The PRISM model is supported by the seven West Midlands Metropolitan Authorities, the Highways Agency and Centro. The model has significant detail in zoning and networks and accords with the latest WebTAG requirements. The transport analysis guidance provided by WebTAG details the requirements for an effective strategic transport model and PRISM was developed to be consistent with these. The use of PRISM for this strategic assessment role ensures that the process accords with central and regional government planning requirements.

The detail in the representation of population allows the model to distinguish the impacts of policies on different social groupings.

The PRISM travel demand model is linked to highway and public transport assignment models using VISUM and has been developed to include the following variable demand responses:

- change in trip making/trip frequency;
- change in mode;
- change of destination/trip distribution;
- change in time of travel; and
- change in route.

The public transport representation includes bus, metro and rail as an integrated system, although the demand model identifies the main mode used, as a hierarchy (train over metro over bus). In addition to the explicitly represented highway and public transport modes, non-mechanised modes are represented in the demand model, but not assigned to the networks. Freight trips by road (LGVs and HGVs) are separately identified.

Demand responses are triggered by changes in population and employment, changes in the location and accessibility of travel destinations, and changes in the cost of travel by mode, whether occurring independently (such as slowly rising congestion) or as part of a strategy (such as fare rises or parking management). Smarter Choices can be reflected using the recent DfT guidance on the subject (WebTAG Unit 6.6.10D).¹³

6.4 PRISM Modelling Parameters

6.4.1 Network Coverage and Representation

In application, the PRISM coverage is the whole of the West Midlands, which is important given the spatial and functional interactions between the Districts, and between the metropolitan area and the Shire counties. For the Birmingham Development Plan work, the model's details in Birmingham itself, and specifically in the City Centre, are well-suited for the testing of the Birmingham Development Plan. The approach that is proposed is one that Mott MacDonald has applied on many other occasions. One of the

¹² Mott MacDonald (2010): 'PRISM: An Introductory Guide'. See: <http://217.206.77.227/prism/Downloads/Guide/PRISM%20-%20an%20introductory%20guide.pdf>

¹³ More information regarding PRISM is provided at www.prism-wm.com

key advantages that this approach brings is that all travel demand effects are modelled within a single modelling framework, which is WebTAG compliant.

However, the extent of the area modelled for this study needs to be agreed with stakeholders before modelling commences.

6.4.2 Model Time Periods

The highway model represents weekday traffic for a neutral month for the following time periods:

- AM peak (07:00–09:30);
- Inter peak (09:30–15:30);
- PM peak (15:30–19:00); and
- Off peak (19:00 –07:00).

6.4.3 Model Demand Segmentation

We propose use classes for the model as defined in PRISM. We consider that HGVs should be treated separately to the other traffic (cars and light vehicles) as HGV drivers have different perceptions of travel costs in terms of time and distance. This behaviour is reflected in the different values of time and vehicle operating cost of each user class that are estimated from the economic values recommended by WebTAG (Unit 3.5.6). Also, LGVs and HGVs have exhibited quite different growth patterns to car traffic recently, whilst the Birmingham Development Plan may well need to include specific freight-related policies as mitigating measures.

6.4.4 Assessment Years

The PRISM 2006 base year model has been calibrated and validated with the objective of meeting the DfT's Design Manual for Roads and Bridges (DMRB) validation guidelines. A Local Model Validation Report can be made available if required. The PRISM future year scenarios are 2016 and 2026.

The assessment years to be modelled for the purposes of this study need to be agreed with stakeholders. Based on the Development Plan's likely forecast horizon of 15 years and the future year scenarios already available in the PRISM model, the following assessment years are proposed:

- Base Year: 2011
- Short-Term Forecast: 2016
- Horizon Forecast: 2026

We understand that a 2031 assessment may also be required. If this or other assessment years are required, interpolation or extrapolation of the PRISM outputs would have to be undertaken.

6.4.5 Assessment Scenarios

It is proposed to model the following two main scenario types:

- Base Year Scenario – the existing situation
- Future Year Scenarios – projected future conditions

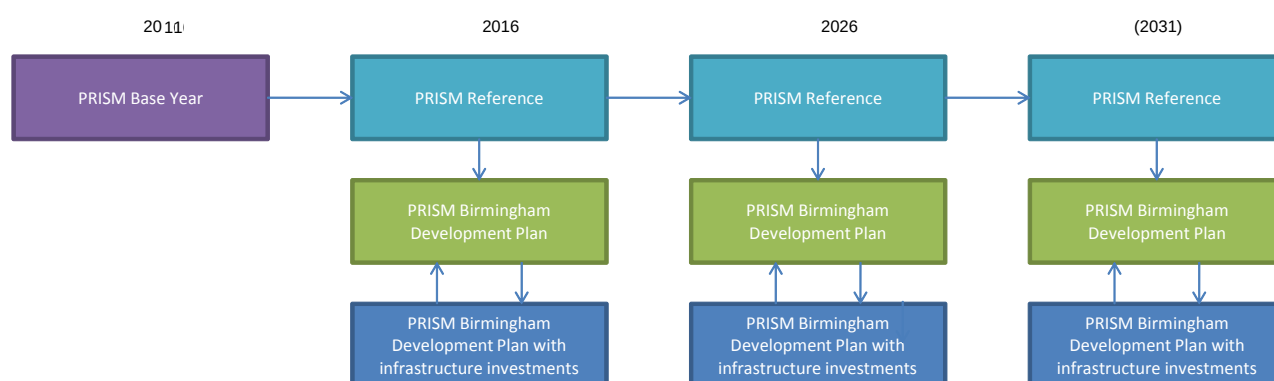
In turn, for the future year scenarios, it is proposed to consider in each case the following two scenarios:

- Reference Case – This represents the future year scenario with all the predicted and committed transport changes but without the Development Plan in place. This provides a future reference against which to isolate and compare the transport impacts of the Development Plan.
- Development Plan Case – This represents the future year scenario with all the predicted transport changes and *with* the Development Plan in place. This is the scenario where the full impacts of the Development Plan can be identified, through comparison with the Reference Case.

Identification of the Development Plan's transport impacts will allow mitigation options to be proposed. The future network without mitigation options is referred to as the 'Do-Minimum' network and, with mitigation, the 'Do-Something' network. This is in accordance with the WebTAG requirements.

The proposed scenarios are shown in the following diagram.

Figure 6.1: Proposed PRISM modelling scenarios



Early confirmation from Birmingham City Council and other stakeholders, particularly the Highways Agency, is required to confirm that these scenarios are acceptable.

6.5 Construction of Modelling Scenarios

As described in Sections 3 to 5 above, the future modelling scenarios are based on a set of assumed future land use and transport changes. It is essential to agree with Stakeholders at the earliest stage this set of assumptions.

Details of present assumptions and information gaps are provided in the following sub-sections.

6.5.1 Base Year Scenario

It is assumed that a present-day representation (2011/2012) of the transport system and land-use is required. Updating the base year 2006 network to the present day is relatively straightforward, although there are several ways in which to update the base year 2006 travel demand. Each of the following

methods results in networks (transport system) and demand matrices (result of demographics) that can be analysed with respect to the present-day.

6.5.1.1 Base Year Option 1 – Adjustment of a 2011 PRISM Forecast using Traffic Counts

The most straightforward approach is to use the 2006 PRISM forecast as a proxy for 2011 without any changes, acknowledging any differences between the models. This would be the quickest and most inexpensive method, but the least robust.

6.5.1.2 Base Year Option 2 – Adjustment of the Existing 2006 Base Matrices using Traffic Counts

This method, also known as matrix estimation, involves applying growth factors to all traffic through a particular element of the network (road, turn etc) based on the difference between the modelled (2006) and counted (present) values. By doing this for a sample of network elements in the area of interest and applying the average change to all non-observed elements¹⁴, we obtain a rough estimate of the present-day demand. Present day land-use would be implied from application of the present day traffic counts.

This would be the medium cost and timescale option of the three.

6.5.1.3 Base Year Option 3 – Adjustment of a 2011 PRISM Forecast using Traffic Counts

This method is similar to Option 2 above, but uses the more robust starting point of a PRISM forecast which will take into account the change in socio-demographics between 2006 and 2011 prior to applying matrix estimation to improve the network flows.

This would be the most expensive method in terms of cost and timescale but also the most robust.

6.5.2 Reference Case Scenario

6.5.2.1 Land Use Data and Travel Demand

To estimate the future demand in 2016 and 2026, PRISM uses population and employment statistics to forecast future travel demand growth in the modelled area. The basis of the current forecasts is RSS2 (derived from the Regional Spatial Strategy), which is allocated to a finer zoning system using local planning permissions, and controlled to TEMPRO forecasts. The following issues need to be resolved with stakeholders:

- Is RSS still considered the most reasonable forecast of the distribution of growth in population and employment or are better figures available?
- Should the study force the RSS growth forecasts to be constrained to TEMPRO or should unconstrained growth be allowed?
- How should the impact of the recession be reflected, compared with the optimistic RSS figures?

This forecasting approach is compliant with WebTAG requirements and has been used in previous PRISM modelling projects including the recent M5 / M6 evidence base for the Highways Agency and the Solihull Core Strategy work.

¹⁴ Or alternatively apply an overall TEMPRO change factor prior to the matrix estimation

If the data within the PRISM model is constrained using TEMPRO for the Reference Case only, this will enable the Birmingham Development Plan modelling to be fully comparable to the M5/M6 study. It will also be compliant with DfT's WebTAG requirements.

6.5.2.2 'Do-Minimum' Network Building

A summary of the committed transport schemes already included within the PRISM forecast model years is provided in Table 6.1 below. Agreement must be reached between all stakeholders that this list is complete, and that delivery years are in line with current expectations.

Table 6.1: Committed transport schemes included in PRISM model years

Scheme	Status
A38 Northfield Regeneration	Built
Coventry Bus Network (Primelines)	Built
Hagley Road Bus Showcase	Built
Outer Circle/Radial Routes Showcase	Unknown
Cradley Heath Town Centre Strategy	Built
Red Routes Package 1	Built
Wolverhampton Centre Access Interchange	Built
Selly Oak New Road	Built
Walsall Town Centre Package	Built
Coleshill Multi Modal Interchange	Built
Owen Street Level Crossing Relief Road	Built
Brierley Hill Sustainable Access Network	Built
West Midlands UTC	Under Construction
Birmingham New Street Station (Birmingham Gateway)	Under Construction
M40 Junction 15 (Longbridge Roundabout)	Built
Hard Shoulder Running M42 Junctions 4-6	Built
Hard Shoulder Running M6 Junction 4-5	Built
Controlled Motorway M40 Junction 16 to J3A M42	Built
Hard Shoulder Running M6 Junction 8-10a	Built
Hard Shoulder Running M6 Junction 10a-13	Full approval to start by 2015
Hard Shoulder Running M5 Junction 4a-6	On Hold
Hard Shoulder Running M6 Junction 2-4	Unknown
Hard Shoulder Running M6 between B'ham and Manchester	Unknown
BHX/NEC Public Transport (ANITA)	Built
A4123 Junction (Burnt Tree)	Built
A41 Expressway	Built
St Chads junction	Built
Hard Shoulder Running M6 Junction 5 to 8	Under construction

In addition to the above schemes there are a number of schemes that are being promoted by local authorities and other transport operators, as described in previous sections. A review has identified the following projects that need to be considered through this assessment; see Table 6.2.

Table 6.2: Further committed transport schemes to be added to PRISM forecast model years

Scheme	Status
A452 Chester Road access improvements	Planned 2013
A45 Capacity scheme	Planned
A457 Dudley Road	Planned
High Speed Rail	Planned
Midland Metro extension to five ways	Early stages
Camp hill chords link to Moor Street station	Unknown
Camp hill line stations	Unknown
Longbridge Hub	Planned
Birmingham City Centre Interchange (BCCI)	Built
Local area action plans	Planned

The schemes included in Table 6.2, need to be reviewed with Birmingham City Council, Centro and the Highways Agency to confirm that the information is comprehensive and that no further schemes need to be included within the study scope.

6.5.3 Development Plan Scenario

6.5.3.1 Land Use Data and Travel Demand

The way in which the Development Plan differs from the forecasts used to generate the Reference Case demand scenario (see above) will need to be supplied to us by the client as the emerging Plan takes shape.

Minimum data requirements for each scenario are:

- Total population
- Location of population growth by PRISM zone in the Birmingham Development Plan (note: not housing but people)
- Location of employment growth in the Birmingham Development Plan by PRISM zone (again, not shopping centres or office blocks, but actual jobs)
- Overall economic growth (GDP or similar)

6.5.3.2 'Do-Something' Network Building

The extra network measures required in order to accommodate the Development Plan proposals will emerge from the next stage of modelling (see below). However, once determined, these will be added back into the 'Do-Minimum' model network to create the 'Do-Something' network.

6.5.4 Other Considerations

It is noted that the assessment approach will need to consider some of the uncertain future developments that may have a significant impact on the success of the Birmingham Development Plan, and the need for mitigating measures. This includes the introduction of HS2, impacts from other relevant Core Strategies (e.g. Solihull) and other policies that will impact on Birmingham and, particularly, the M5/M6/M42 'Motorway Box'. Some of these may need to be included in the do-minimum model; others, such as HS2, may best be

dealt with through sensitivity tests. Higher housing and employment growth scenarios will also need to be dealt with through sensitivity tests. This information will need to be provided by Birmingham City Council.

It is critical that at the outset there is agreement between all stakeholders what the appropriate do-minimum representation is.

6.6 PRISM Model output

PRISM will be run for the Birmingham Development Plan option as identified above. It will be used to identify where there are hotspots within the model particularly around the Motorway Box and the City Centre for both 2016 and 2026 (and if required, for 2031).

The assessment of the impacts of the Birmingham Development Plan on network pinchpoints will be undertaken using:

- identification of links and junctions over capacity;
- quantification of speeds below a threshold value;
- presentation of overcrowding on public transport lines; and
- plotting of changes in accessibility.

The output from PRISM will inform the next stage of the study, by identifying areas, roads and junctions that require further more detailed modelling and the relevant growth factors required for the scenario testing of these areas, roads and junctions, reflecting spatial and infrastructure development and the complex travellers' responses to these.

Base year observed traffic flows will be factored by applying the growth factors from PRISM. The PRISM model forecasts up to 2026, if it is required modelling between 2016 and 2026 will be undertaken using interpolation or extrapolation of the growth.

Growth factors from the PRISM model will be derived from a cordon analysis around local models, and for junction models from growth observed on the approach links to a junction. This method has been successfully applied in many previous studies, including the successful A45 Bridge Renewal Major Scheme Business Case for Solihull Council, approved earlier this year by DfT.

For junctions, we can create a global factor. These factors would be applied to all approach flows in the junction models. Where a strong differential growth pattern occurs, differential factors between each of the approach and exit arms may be more appropriate. This will need to be agreed with Birmingham City Council and the Highways Agency as appropriate.

6.7 Local Area Models

Local area models will be used where appropriate to design and test the effectiveness of mitigating measures.

The Birmingham Development Plan will have concentrated effects in some parts of the City, and at least in:

- Longbridge
- Birmingham City Centre
- A38 technology Corridor including University
- East Birmingham including Birmingham Airport

In discussion with Birmingham City Council, we have established that the following local models are in existence for the Birmingham Development Plan areas:

- City Centre Traffic Model (BLUTS) - SATURN
- BB3-MM A38(M) – VISSIM (HA owned)
- Chester Road Model - Paramics
- Sutton Coldfield Model - VISSIM
- Six Ways - VISSIM
- Station Road Stechford - VISSIM
- Robin Hood Roundabout - VISSIM
- BCCI / City Centre - VISSIM
- Longbridge - VISSIM
- Selly Oak - Contram

The time periods modelled and the base year of these models differ. Agreement will be required from Birmingham City Council, Centro and the Highways Agency (as appropriate) if these models are required for assessments. Before use, each model would need to be reviewed to assess whether they are suitable to use 'as is' or need some updating.

6.8 Detailed Junction Modelling

The PRISM model runs, and any local model runs where available, will identify where there are hotspots of delays on the strategic highway network. The final stage of the modelling contribution of the study will be to undertake more detailed assessments of the critical junctions to identify any mitigation required.

The first task before detailed junction modelling can be undertaken is to identify what existing traffic data is available for each of the junctions identified and if there is a requirement for traffic surveys.

6.9 Mitigation Options

The local area and detailed junction modelling will identify which mitigation measures are required to achieve the proposed growth in the Birmingham Development Plan; note that these measures may include Smarter Choices, which will be addressed using the Department for Transport recent guidance on the subject (WebTAG Unit 3.10.6.D). The options could also include revisions to the Development Plan proposals so that impact in certain areas is reduced.

This mitigation options will be fed back into the PRISM model to form the 'Do-Something' network (as explained above) in order to test their strategic impact.

A high level estimate cost will be provided for identified mitigation.

6.10 Modelling Dependencies

The delivery of the study to programme is dependent on a number of key inputs which are required at the outset of the third stage of the study. These are raised in the various subsections above and summarised here:

1. Definition of assessment area
2. Definition of time periods to be modelled
3. Definition of years to be modelled
4. Agreement of scenarios to be modelled
5. Agreement of Base Year modelling approach
6. Definition of population and employment data for each of the model years (Reference Case and Development Plan)
7. Description of Do-Minimum schemes to be considered as built in each of the forecast years
8. Definition of additional infrastructure changes to be modelled
9. Definition of sensitivity tests required

6.11 Summary

Building on the policy and data source review of previous sections, we envisage the approach to the modelling for the study to be based on well established and DfT approved techniques and data. The PRISM model is the most appropriate tool for the strategic modelling exercise and is capable of providing Birmingham City Council and all other stakeholders with the detail required to assess the suitability of the developing Birmingham Development Plan and its impacts on the transport network.

The PRISM model will provide detail of the link capacity and the extent of change related to each of the scenarios. The PRISM model results will be used to determine which highway and public transport network elements require further more detailed modelling to assess the impact of the Birmingham Development Plan and the need for mitigation.

The third stage of this study will be to use local models and develop detailed junction models to design and evaluate the mitigating measures, to include operational network changes, smarter choices and junction improvements. All models will benefit from robust and consistent growth forecasts from the PRISM modelling. The requirements for additional survey data will be determined at this stage.

7. Report Summary

7.1 Overview

The purpose of this report is to present the scope of how we will prepare a Transport Evidence Base to support Birmingham City Council's emerging Development Plan in order that consensus between stakeholders can be achieved from the outset on:

- Proposed study methodology (*how we're going to do the study*);
- Key study inputs (*what the study expects from stakeholders*); and
- Proposed study outputs (*what stakeholders can expect from the study*).

7.2 Summary of Proposed Study Methodology

The primary aims of the Transport Evidence Base are to:

1. Assess the transport impacts of the Development Plan proposals, both positive and negative; and to
2. Propose policy-compliant mitigation to address negative impacts where they occur.

The study is therefore essentially a policy-compliant assessment of transport impacts. The main stages of the proposed study methodology are therefore as follows:

Table 7.1: Proposed study stages

Study Stage	Label	Description
Stage 1	Scoping	Establishing and agreeing key study parameters from the outset (ie this report);
Stage 2	Establishing Context	Building up the full picture of relevant policy, plans and programmes which set the context for being able to assess the Birmingham Development Plan's future impacts;
Stage 3a	Strategic Modelling	Assessing area-wide future impacts through strategic modelling;
Stage 3b	Junction Modelling	Local area modelling of specific junctions and development of mitigation measures
Stage 4	Infrastructure Delivery	Considerations of design, cost, funding and delivery of required new infrastructure;
Stage 5	EIP Assistance	Expert witness support to the Council at the Planning Inquiry.

The key stage of the methodology is Stage 3a (Strategic Modelling) because this is the stage where the Birmingham Development Plan's transport impacts – both positive and negative – are quantified. The West Midlands PRISM model will be employed for this task and, in order to quantify impacts, will consider:

- Base year scenario – which represents a present-day transport and land-use scenario;
- Future year scenarios – which represent the impacts of the Birmingham Development Plan on the future transport network so that appropriate mitigation measures can be identified.

The primary purpose of Stage 2 of the study is therefore to develop an understanding of these scenarios through a review of all relevant policy, plans and programmes with a view to providing an evidence-based context, as well as data, for the subsequent assessment stages.

7.3 Summary of Key Study Inputs

The delivery of the study to programme is dependent on a number of key inputs which are required at the outset of the third stage of the study. These are raised in the various subsections above and summarised here:

1. Definition of assessment area (see Section 6.4.1)
2. Definition of time periods to be modelled (see Section 6.4.2)
3. Definition of years to be modelled (see Section 6.4.4)
4. Agreement of scenarios to be modelled (see Section 6.4.5)
5. Agreement of Base Year modelling approach (see Section 6.5.1)
6. Definition of population and employment data for each of the model years (Reference Case and Development Plan) (see Section 6.5.2.1)
7. Description of 'Do-Minimum' schemes to be considered as built in each of the forecast years (see Section 6.5.2.2)
8. Definition of additional infrastructure changes to be modelled (see Section 6.5.3.2)
9. Definition of sensitivity tests required (see Section 6.5.4)

7.4 Summary of Proposed Study Outputs

The main outputs of the study will be as follows:

1. Stage 2 qualitative evidence base report
2. Stage 3 modelling assessment results report
3. Stage 4 infrastructure delivery report
4. Stage 5 expert witness assistance at the Planning Inquiry