BIRMINGHAM DEVELOPMENT PLAN

Transport and Infrastructure Evidence Base and Strategy

June 2014

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Contents

Glossary

AAP	Area Action Plan
BCC	Birmingham City Council
BDP	Birmingham Development Plan
CIL	Community Infrastructure Levy
DPD	Development Plan Document
HA	Highways Agency
HCA	Homes and Communities Agency
HIL	Highway Improvement Line
HS2	High Speed 2
IDP	Infrastructure Delivery Plan
LEV	Low Emission Vehicle
LTPP	Long Term Planning Process
NEC	National Exhibition Centre
NPPF	National Planning Policy Framework
ONS	Office of National Statistics
PRISM	Policy Responsive Integrated Strategy Model
RAG	Red Amber Green
RTI	Real Time Information
SDP	Site Delivery Plan
SHN	Strategic Highway Network
SPD	Supplementary Planning Document
SQPS	Statutory Quality Partnership Scheme
SRN	Strategic Road Network
SUE	Sustainable Urban Extension
UTMC	Urban Traffic Management and Control
WCML	West Coast Main Line

Background and Context

1 Background and Context

1.1 Background to the Birmingham Development Plan

The Birmingham Development Plan 2031 (BDP) will, once adopted, become part of the City's statutory planning framework guiding decisions on all development and regeneration activity over the period to 2031. The BDP sets out final proposals for how and where new homes, jobs, services and infrastructure will be delivered and the type of places and environments that will be created. This report sets out the supporting evidence base for transport provision to support growth set out in the BDP.

The overall approach of the BDP is to support the continued renaissance of Birmingham which will see the City Council plan for significant new development to meet the needs of its growing population and ensure that it builds a prosperous economy for the future.

1.1.1 BDP Objectives

To deliver the vision of Birmingham in 2031, and ensure that future development meets the aspirations for the City, the objectives of the BDP are:

1	To develop Birmingham as a City of sustainable neighbourhoods that are safe, diverse and inclusive with locally distinctive character;
2	To make provision for a significant increase in the City's population;
3	To create a prosperous, successful and enterprising economy with benefits felt by all;
4	To promote Birmingham's national and international role;
5	To provide high quality connections throughout the City and with other places including encouraging the increased use of public transport, walking and cycling;
6	To create a more sustainable City that minimises its carbon footprint and waste while allowing the City to grow;
7	To strengthen Birmingham's quality institutions and role as a learning City and extend the education infrastructure securing significant school places;
8	To encourage better health and well-being through the provision of new and existing recreation, sport and leisure facilities linked to good quality public open space;
9	To protect and enhance the City's heritage and historic environments;
10	To conserve Birmingham's natural environments, allowing biodiversity and wildlife to flourish; and
11	To ensure that the City has the infrastructure in place to support its future growth and prosperity.

1.1.2 Levels of Growth

Over the period 2011 to 2031 the BDP sets the following levels of growth within Birmingham's administrative boundary to support its growing population, and the ongoing strengthening and diversification of its economy:

- 51,100 additional dwellings;
- Two Regional Investment sites of 20 and 25 hectares and a 80 hectare employment site at Peddimore;
- A minimum five year reservoir of 96 hectares of land for employment use;
- About 270,000m^2 gross of comparison retail floorspace by 2026;

- A minimum of 745,000m^2 gross of office floorspace in the network of centres; and
- New waste facilities to increase recycling and disposal capacity, and minimise the amount of waste sent directly to landfill.

1.1.3 BDP Progress to Date

The preparation of the BDP started in 2007 when the City Council decided that a new strategic planning document was needed to guide future growth and development. In autumn 2008, a period of public consultation was held seeking views on a proposed strategy and range of options for delivering housing and economic growth. Following this consultation further work was carried out and in December 2010 a document entitled the Birmingham Core Strategy Consultation Draft was published.

As progress was being made in producing the final version of the BDP, a number of significant changes occurred. The publication of the National Planning Policy Framework and the emergence of higher population projections required a review of how the City should plan for future development which necessitated a further round of consultation to identify options for meeting the new challenges.

Between October 2012 and January 2013 a further options consultation on Planning for Birmingham's Growing Population was held. The outcomes of that consultation along with all previous work and comments made during the past consultations were drawn together to inform the BDP.

Throughout all of the consultations, a wide range of people and organisations have been engaged to gain as many ideas and opinions as possible on how Birmingham could develop up to 2031. **Chapter 8** provides further details. In developing the BDP, the City Council has worked with adjoining authorities and other organizations collaboratively through the Duty to Co-operate to seek to identify a way forward on those issues of a strategic nature that are of greater than local significance.

We now consider that the version of the plan is the most appropriate strategy to deliver the future growth and prosperity of the City for the period to 2031. This evidence base report will provide confidence that the BDP:

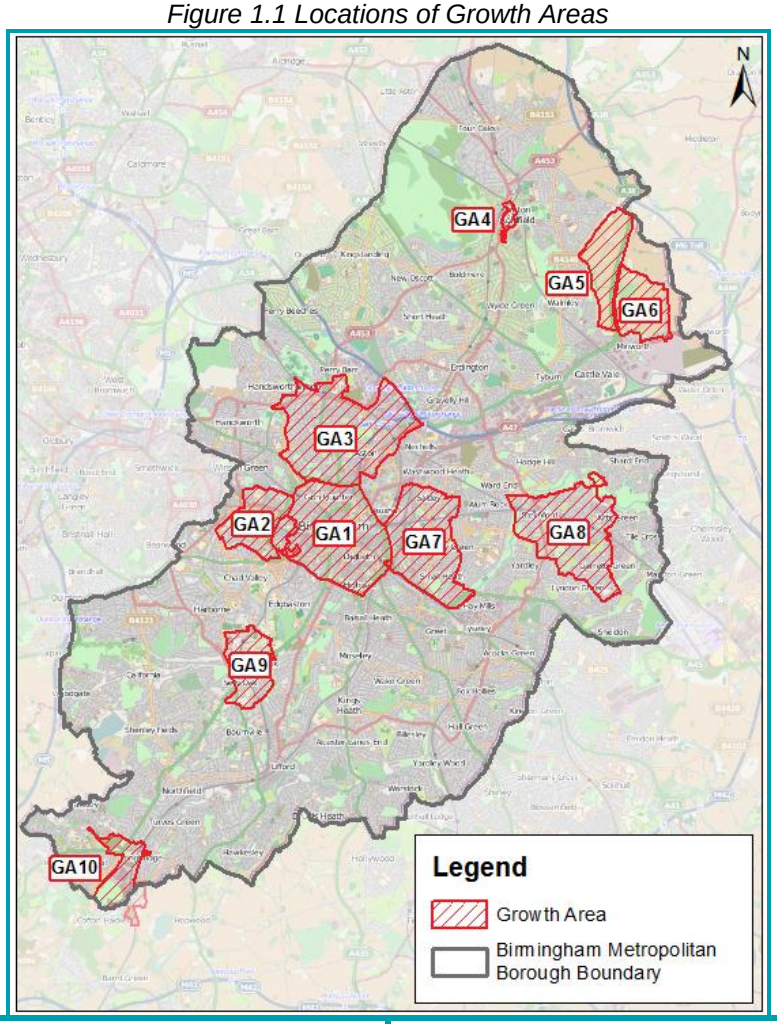
- Is consistent with national planning policy;
- Meets the development and infrastructure needs of the City along with any needs from neighbouring areas where it is reasonable to do so;
- Is consistent with achieving sustainable development;
- Has considered all reasonable alternatives in producing the Plan;
- Is justified with evidence to support the approach taken in the Plan;
- Has been prepared through joint working to address cross boundary issues; and
- Is deliverable.

1.2 The Growth Areas

Delivering the BDP strategy will require focusing significant development into a number of locations which currently play an important role in providing homes, jobs and supporting facilities. These are identified as Growth Areas, and reflect the availability of development opportunities and existence of current or planned infrastructure.

To meet the needs of the growing population and ensure that sufficient high quality accessible land is available for residential and economic development, the City Council has also planned for the expansion of the urban area through the removal of land from the Green Belt. This will enable the delivery of a planned sustainable urban neighbourhood and a large employment site both located in the northeast of the City. These areas are also identified as Growth Areas. The Growth Areas are:

Figure 1.1 Locations of Growth Areas



GA1 - City Centre	GA2 - Greater Icknield
GA3 - Aston, Newtown & Lozells AAP	GA4 - Sutton Coldfield
GA5 - Langley SUE	GA6 - Peddimore
GA7 - Bordesley Park AAP	GA8 - Eastern Triangle
GA9 - Selly Oak and South Edgbaston	GA10 - Longbridge AAP

The wider City will also see levels of growth reflecting the historic patterns of development and availability of land. This distribution of growth is more dispersed, focused on opportunity sites and key transport corridors. This includes housing renewal areas, such as Kings Norton and Druids Heath, areas of employment land, and District and Local Centres.

1.3 Transport Policies

High quality connections by road, rail, bus, walking, cycling or digital, are all vital to the City's future economic prosperity and social inclusiveness. These connections provide access to education, employment, business, retail and leisure opportunities.

In total, 8 policies have been identified that relate specifically to transport infrastructure provision in unlocking the growth set out in the Birmingham Development Plan:

TP37 – A sustainable transport network

TP38 – Walking

TP39 – Cycling

TP40 – Public transport

TP41 – Freight

TP42 – Low emission vehicles

TP43 – Traffic and congestion management

TP44 – Accessibility standards for new development

The following chapters provide a summary of evidence that has been collated to support each of the eight transport policies, with an overview provided in **Chapter 7**.

1.4 Transport Evidence Collation Process

The transport evidence base for the BDP consists of a number of documents that provides progress from identification of existing issues to the development of preliminary designs for specific schemes associated with one of the ten Growth Areas.

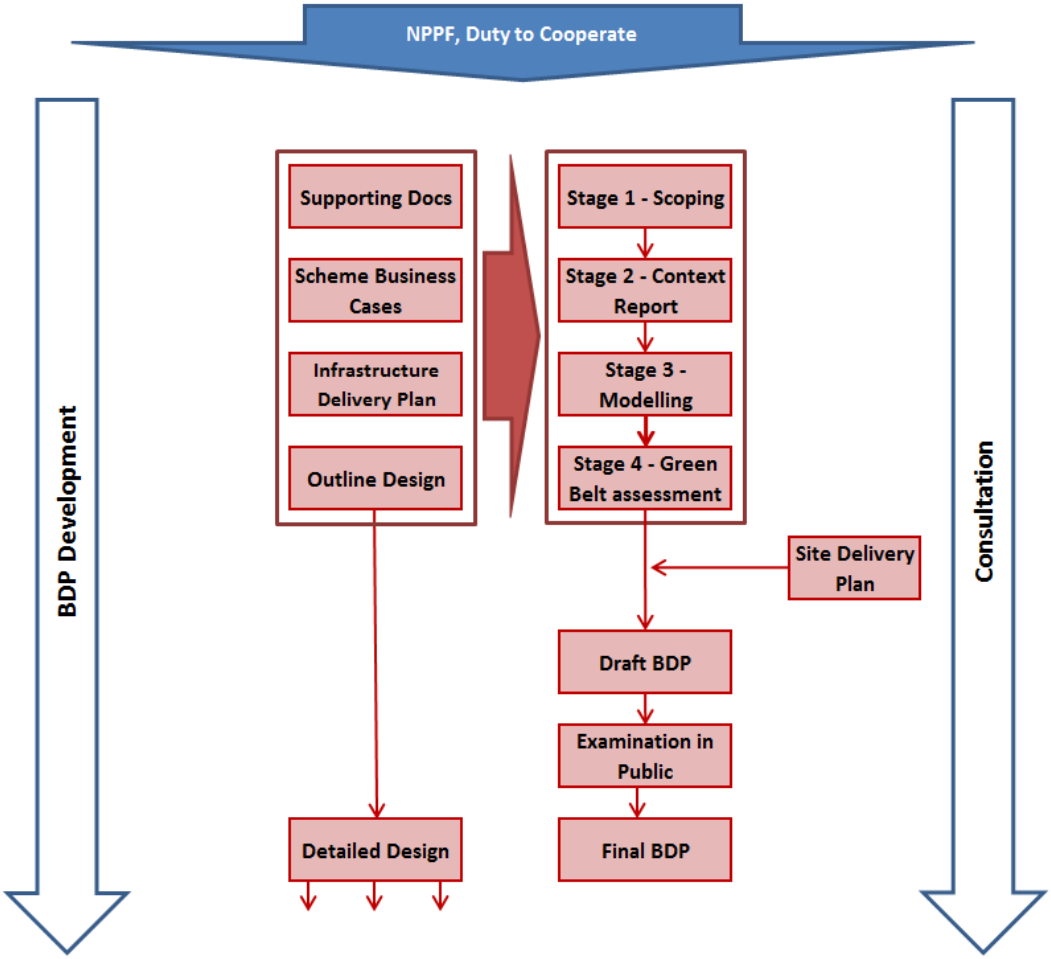
In parallel with the progression of schemes, other aspects of the BDP have been developed, in addition to ongoing consultation through each stage. In doing so, it is anticipated that the transport evidence is robust with a full set of appropriate infrastructure to support the ten Growth Areas across Birmingham.

The full set of transport evidence reports are provided online[1]. **Appendix B** provides a brief outline of each of the documents.

Figure 1.2 demonstrates the process which has been followed in collating evidence to support the BDP.

[1] http://www.birmingham.gov.uk/cs/Satellite?c=Page&childpagename=Development-Planning%2FPageLayout&cid=1223432916127&pagename=BCC%2FCommon%2FWrapper%2FWrapper

Figure 1.2 Evidence Collation Process



1.5 Structure of this report

The structure of this evidence base report is as follows:

- Chapter 2 – provides a background to the National Planning Policy Framework and its importance in creating the BDP and associated documents;
- Chapter 3 – provides an overview of the modelling to support the transport and connectivity sections of the BDP;
- Chapter 4 – details specific evidence collated in association with the green belt development and the required transport infrastructure;
- Chapter 5 – outlines a number of transport strategies that have been developed to inform the BDP;
- Chapter 6 – provides an overview of BDP implementation, including the specific infrastructure requirements associated with the Growth Areas;
- Chapter 7 – provides a summary of evidence associated with each of the BDP Connectivity Policies;

- Chapter 8 – details the stakeholder engagement involved throughout the BDP delivery and ongoing engagement as the Plan progresses towards examination;
- Chapter 9 – demonstrates the known sources of funding for transport schemes;
- Chapters 10 – provides an insight into ongoing work that is associated with the BDP, and enhance the existing full and robust evidence base.

National Planning Policy Framework

2 National Planning Policy Framework

2.1 Background to the National Planning Policy Framework (NPPF)

The 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.*[2]

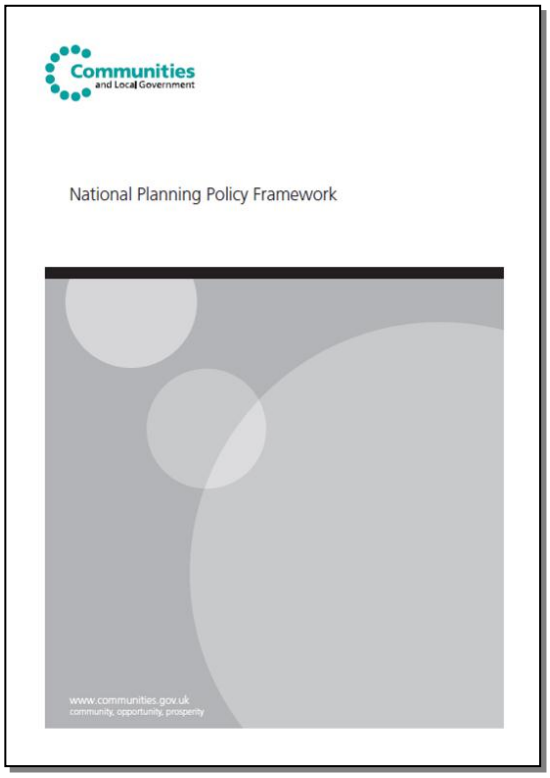
In the document foreword, the Minister for Planning writes that:

> *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.*

2.2 Transport provision within the NPPF

Paragraphs 29 to 41 of the National Planning Policy Framework (NPPF) relate directly to transport provision for sustainable development[3]. In summary:

- The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas;
- Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion;
- Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development;
- All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment;
- Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised;
- Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and



[2] Department for Communities and Local Government (2012): 'National Planning Policy Framework'
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

designed where practical to:
    - Accommodate the efficient delivery of goods and supplies;
    - Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
    - Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;
    - Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
    - Consider the needs of people with disabilities by all modes of transport.
- For larger scale residential developments in particular, planning policies should promote a mix of uses in order to provide opportunities to undertake day-to-day activities including work on site. Where practical, particularly within large-scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties;
- Local authorities should seek to improve the quality of parking in town centres so that it is convenient, safe and secure, including appropriate provision for motorcycles. They should set appropriate parking charges that do not undermine the vitality of town centres. Parking enforcement should be proportionate;
- Local planning authorities should identify and protect where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice.

The transport evidence outlined within this report should support the Birmingham Development Plan in applying the policies set out in NPPF, and also demonstrate an application of the following:

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.*

2.3 Soundness Self-Assessment

This report sets out a summary of evidence that will be required during the BDP Examination in Public. Throughout the BDP development process, the soundness of information provided has been at the forefront, and has therefore been self-assessed based on the following key requirements:

- Has the plan been positively prepared i.e. based on a strategy which seeks to meet objectively assessed requirements?
- Is the plan justified?
- Is it based on robust and credible evidence?
- Is it the most appropriate strategy when considered against the alternatives?
- Is the document effective?
- Is it deliverable?
- Is it flexible?
- Will it be able to be monitored?
- Is it consistent with national policy?

The framework for soundness self-assessment has been based on the four tests of soundness[4], as set out in the National Planning Policy Framework (NPPF) (para 182): "The Local Plan will be examined by an independent inspector whose role is to assess whether the plan has been prepared in accordance with the Duty to Cooperate, legal and procedural requirements, and whether it is sound. A local planning authority should submit a plan for examination which it considers is 'sound' ", namely that it is:

1. Positively Prepared: based on a strategy which seeks to meet objectively assessed development and infrastructure requirements;
2. Justified: the most appropriate strategy when considered against the reasonable alternatives, based on proportionate evidence;
3. Effective: deliverable over its period based on effective joint working on cross-boundary strategic priorities; and
4. Consistent with national policy: enabling the delivery of sustainable development.

[4] Planning and Advisory Service – PINS and the soundness self-assessment checklist http://www.pas.gov.uk/local-planning/-/journal_content/56/332612/15045/ARTICLE

Modelling Approach

3 Modelling Approach

3.1 Introduction

A four-stage process has been undertaken to review the current transport and connectivity infrastructure across Birmingham, and to model the strategic impacts of the BDP. This modelling has identified transport issues that will arise, or be exacerbated by the development, so that mitigations can be identified. Four of these stages have been completed or ongoing, and are summarised in **Table 3.1**, below.

Table 3.1 Modelling Stages

Transport Evidence Base		
Title	**Date**	**Summary**
Stage 1 – Scoping and Methodology Report	September 2012	An initial scope of the required Transport Evidence Base to support the BDP.
Stage 2 – Context Report	January 2014	A context report prior to assessment of the BDP, reviewing population, employment, deprivation, and transport networks, amongst other key indicators. Also discusses the content of the modelling scenarios to be used in Stages 3 and 4.
Stage 3a – Transport Modelling Assessment Initial Output Report	January 2014	Initial outputs were generated using four runs of PRISM (discussed in detail in **Appendix C**) - base year (2011), reference case (no BDP) and development case (with BDP) for 2021 and 2031. Potential mitigations are identified and outlined.
Stage 3a – Transport Modelling Assessment: Hybrid Model Output	May 2014	The modelling undertaken in January 2014 was updated to reflect refinements and updates in PRISM. Forecasts have been consolidated with Green Belt specific demand modelling on a local scale. The report compares the models, and details the creation of the hybrid model. As above, outputs of network performance are shown and discussed.
Stage 3b – Junction Modelling	January-April 2014	Several modelling reports of specific junctions were undertaken as a result of previous strategic modelling. Junctions that will require improvements are modelled on a micro scale to analyse future capacity issues, and to identify preferred options.
Stage 4 – Green Belt Development Movement Infrastructure Plan	January 2014	A report to identify and test a suitable package of multimodal measures to both support and mitigate the impacts of the development of the Green Belt proposals. This report, and supporting evidence, is discussed in **Chapter 4**.

This chapter summarises the process in more detail, working towards preferred options and mitigations to support the plans outlined in the BDP.

3.2 Stage 1 – Scoping and Methodology Report

The initial stage was undertaken to establish and agree the key parameters for this process, to ensure a holistic approach was achieved. It was important to base this scoping report in the context of current policy guidance, in particular the NPPF and the 'Delivering a Sustainable Transport System' (DaSTS) report, published by the DfT.

A wide range of data, guidance and planning documents have been identified that informs the evidence base, including, but not limited to:

- Numbers of housing, retail, leisure, employment land, offices and hotels, from local authorities in the West Midlands;
- Employment, and population, census and Indices of Multiple Deprivation Data, from Business Register and Employment Survey, and Office for National Statistics respectively;

- Strategic Housing Land Availability, Strategic Housing Market Assessment, Settlement Studies and HCA Business Plan reports, from the BDP, and other development plan evidence base documents;
- Quantitative data from the West Midlands Local Transport Plan targets, West Midlands Cordon Survey Reports and Point Survey Reports;
- Numerous Local Planning Documents, including the BDP, AAPs, Supplementary Planning Documents, Birmingham's Big City Plan and Birmingham City Centre Vision for Movement; and
- Future mode-based transport proposals and schemes, with a wide range of documents on integrated public transport, bus, rail, active travel, smarter choices freight and aviation, from Centro and individual local authorities.

These documents and data sources encompass a wide range of sources, and cover both qualitative and quantitative data, to ensure a well-rounded and inclusive base. Furthermore, alignment with other local authorities through West Midland initiatives and with existing adopted plans provides for a sound and consistent approach.

The methodology for evidence collation and examination is outlined and developed in accordance with WebTAG guidance, ensuring a policy-compliant modelling process is achieved. The main tool that was used is PRISM. This is a model supported by the seven West Midlands local authorities, the Highways Agency and Centro that allows strategic assessment of various scenarios for both public and private transport. PRISM was first developed for a base year of 2004; the current version has undertaken a 'refresh' in 2013 to have a base year of 2011, and forecast models of 2021 and 2031. Four assessment scenarios have been run to inform the evidence base, as follows:

- Base Year Scenario – the existing situation.
- Future Year Scenario – projected future conditions in 2021 and 2031 for;
    - Reference Case – all predicted and projected transport changes, but with no BDP; and
    - Development Plan Case - all predicted and projected transport changes, with the BDP implemented.

For further details regarding the PRISM model, refer to **Appendix C**.

3.3 Stage 2 – Context Report

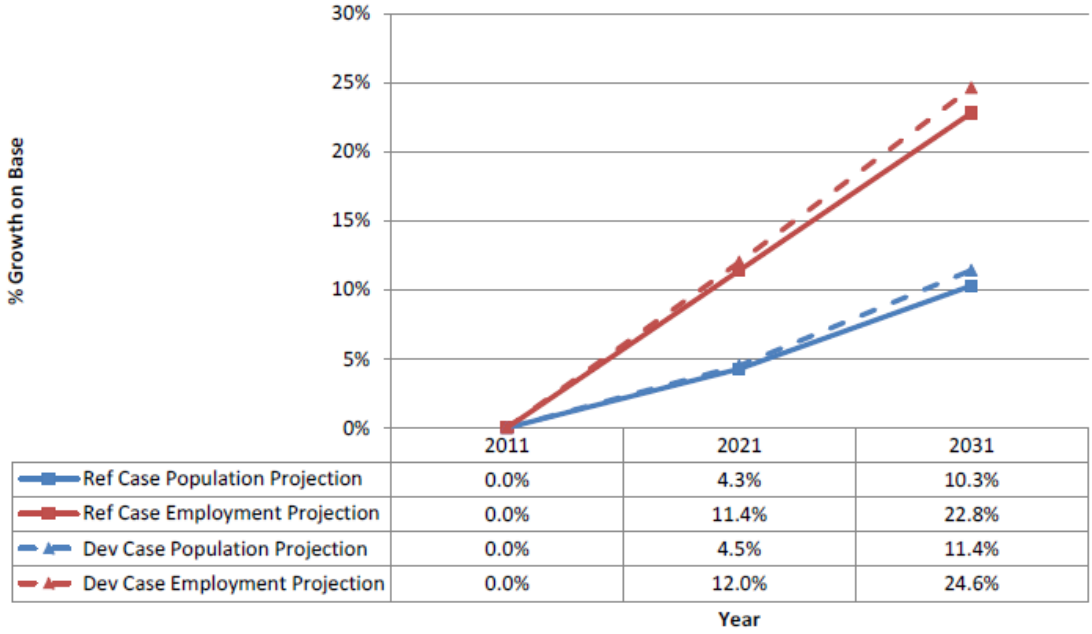
The context report was written to establish the full picture of relevant policy, plans and programmes that are required to assess the BDP's future impacts. Birmingham's current demographic and transport profile has been reviewed to ensure full awareness of consequent transport challenges and opportunities that exist now, and will arise during the implementation of the BDP.

The future year scenarios will feature numerous additions to the network, demographics and land use that are judged to be 'certain' or 'more than likely' to go ahead, as per WebTAG guidance. The table below summarises the reference and development cases.

Table 3.2 Demographic Summary

Measure	Reference Case	Development Case
Highway Transport Schemes – Birmingham	20	28
Public Transport Schemes - Birmingham	7	12
Highway Transport Schemes – Remainder of West Midlands	32	32
Public Transport Schemes – Remainder of West Midlands	7	7

Figure 3.1 Population and Employment Growth Prediction. Source: BCC



3.4 Stage 3a – Transport Modelling Assessment Initial Output / Hybrid Model Report

Junction performance has been used in all scenarios as a measure of how the highway network in Birmingham performed. Three categories of performance are used, and are defined by whether one or more of the arms of the junction are operating:

- 'Under capacity' – where all traffic movements through a junction are operating below 85% capacity;
- 'At capacity' - where one or more traffic movements through a junction are operating between 85% and 100% capacity (flow breakdown and cumulative queuing start to occur within this range); or
- 'Over capacity' - where one or more traffic movements through a junction are operating at over 100% capacity (significant queuing and delay can occur over this value).

This section will review the outputs from the Hybrid model, as this is the latest and most accurate model used to examine the impacts to the highway network. **Table 3.3** highlights performance issues (at or over capacity junctions) along several key arterial and radial corridors or routes in the AM peak, in 2011 and 2031 (reference and development case).

Table 3.3 Summary of Congested Junctions along Key Routes

AM Congested Routes	2011 Base Year		2031 Reference Case		2031 Development Case	
	At Cap.	Over Cap.	At Cap.	Over Cap.	At Cap.	Over Cap.
Birmingham City Centre*	9	1	13	9	13	9
Sutton Coldfield Town Centre*	3	0	3	0	3	0
A4050 Ring Road	8	3	9	8	9	8
A4040 Outer Ring Road	7	1	16	7	20	7

AM Congested Routes	2011 Base Year		2031 Reference Case		2031 Development Case	
	At Cap.	Over Cap.	At Cap.	Over Cap.	At Cap.	Over Cap.
A38 Bristol Road	9	3	10	6	11	5
A441 Pershore Road	2	0	4	1	3	1
A456 Hagley Road	4	2	6	4	5	5
A457 Dudley Road	2	0	2	2	2	2
A34 Walsall Road	3	3	5	5	6	4
A453 College Road	6	1	7	2	7	3
A452 Chester Road	4	0	3	3	3	4
A4097 / A38 Kingsbury Road / Tyburn Road	3	1	3	5	2	6
A38(M) Aston Expressway	0	0	5	1	5	1
A45 Coventry Road	3	0	2	3	2	3
A34 Stratford Road	3	0	5	0	6	0
Total - All junctions	**67**	**12**	**101**	**50**	**105**	**52**

*Defined as within the A4050 Ring Road (Birmingham) or the Sutton Coldfield gyratory.

Green figures demonstrate an improvement for the Development Case over the Reference Case, while red figures demonstrate a negative impact. Improvements between the base and future years are due to future year infrastructure upgrades. Overall, there is a slight increase in the number of junctions at, and over capacity in the development case compared to the reference case. There is a slight decrease in performance for the A4097 / A38 Kingsbury Road / Tyburn Road corridor, which would accommodate a large proportion of the Green Belt development.

Table 3.3 reflects junctions in Birmingham only – junctions along the routes in other local authorities are not counted. Furthermore, there are several other isolated or less strategic junctions at or over capacity. Additional significant congestion has been identified in the following:

- **2011 Base Year** – M42 J9 and J10, M6 J7 and 8, M5 J1 and 2.
- **2031 Reference Case** – M42 J6-J10, M6 J6, M5 J1-3, A34 in Shirley, A41 in Solihull.
- **2031 Development Case** - M42 J6-J10, M6 J6, M5 J1-3, A34 in Shirley, A41 in Solihull.

To summarise, 20 years of population, employment and socioeconomic growth in the West Midlands will have a significant level of impact on highway network junction capacity in Birmingham, as would be expected. Junctions in the city centre core area and on the surrounding Ring Road show a predicted deterioration in performance, as do junctions on the main radial routes in and out of the centre. Birmingham City Council is currently developing a range of measures to manage this level of predicted impact through the Birmingham Mobility Action Plan strategy.

Overall, the difference between the Reference Case and the Development Case is slight. *Figures 3.2* and *3.3* show junctions that have a change in performance between the Reference Case and the Development Case, in the 2031 AM and PM peaks. Overall, the results suggest that the main impacts directly arising from the BDP are centred on the A38 corridor between the Green Belt proposals area and the city centre. To a lesser extent, some impact is also noticeable on Chester Road and towards M42 J9.

Figure 3.2 Junction capacity change between Reference and Development Case, in 2031 (AM Peak)

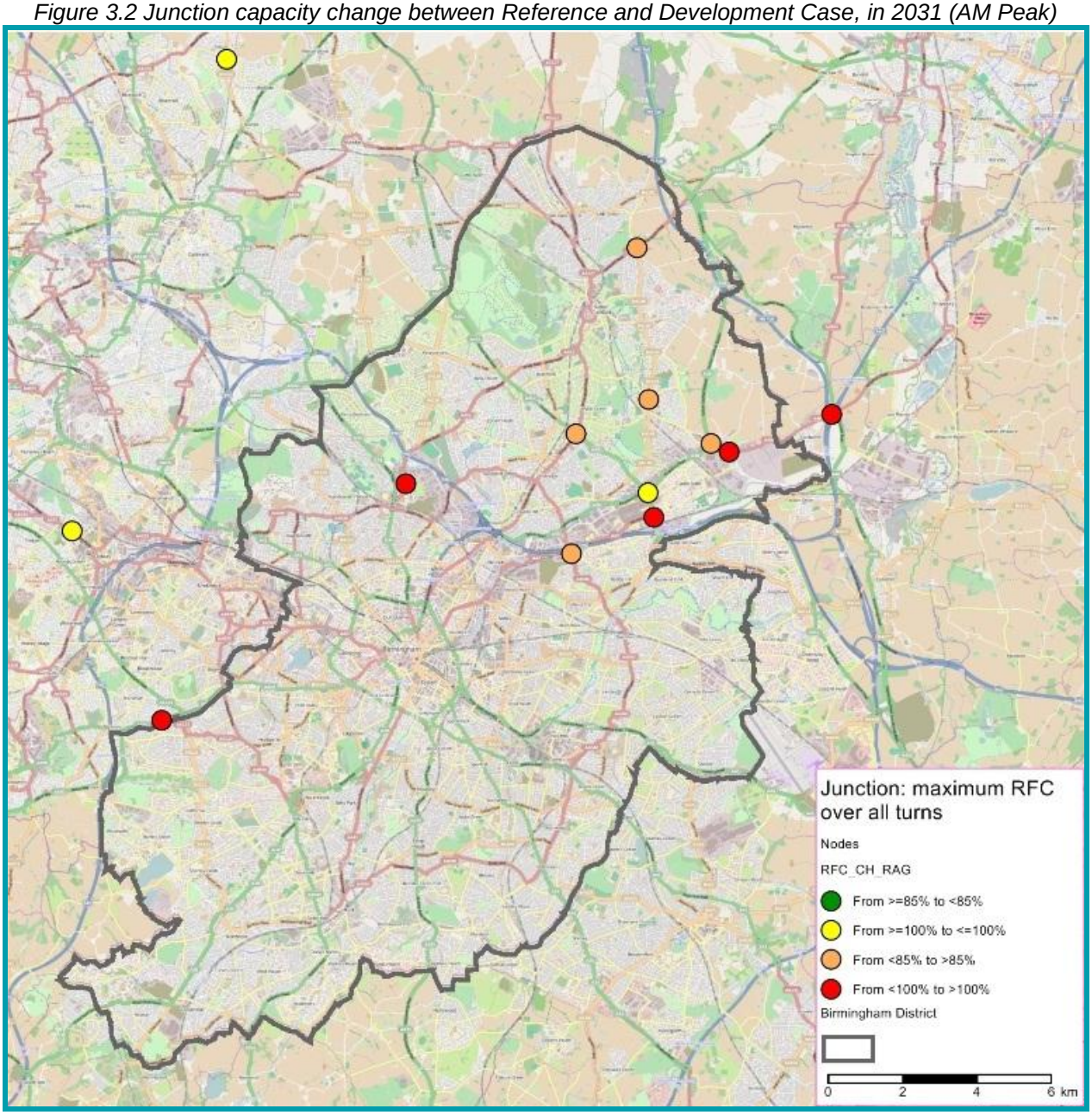
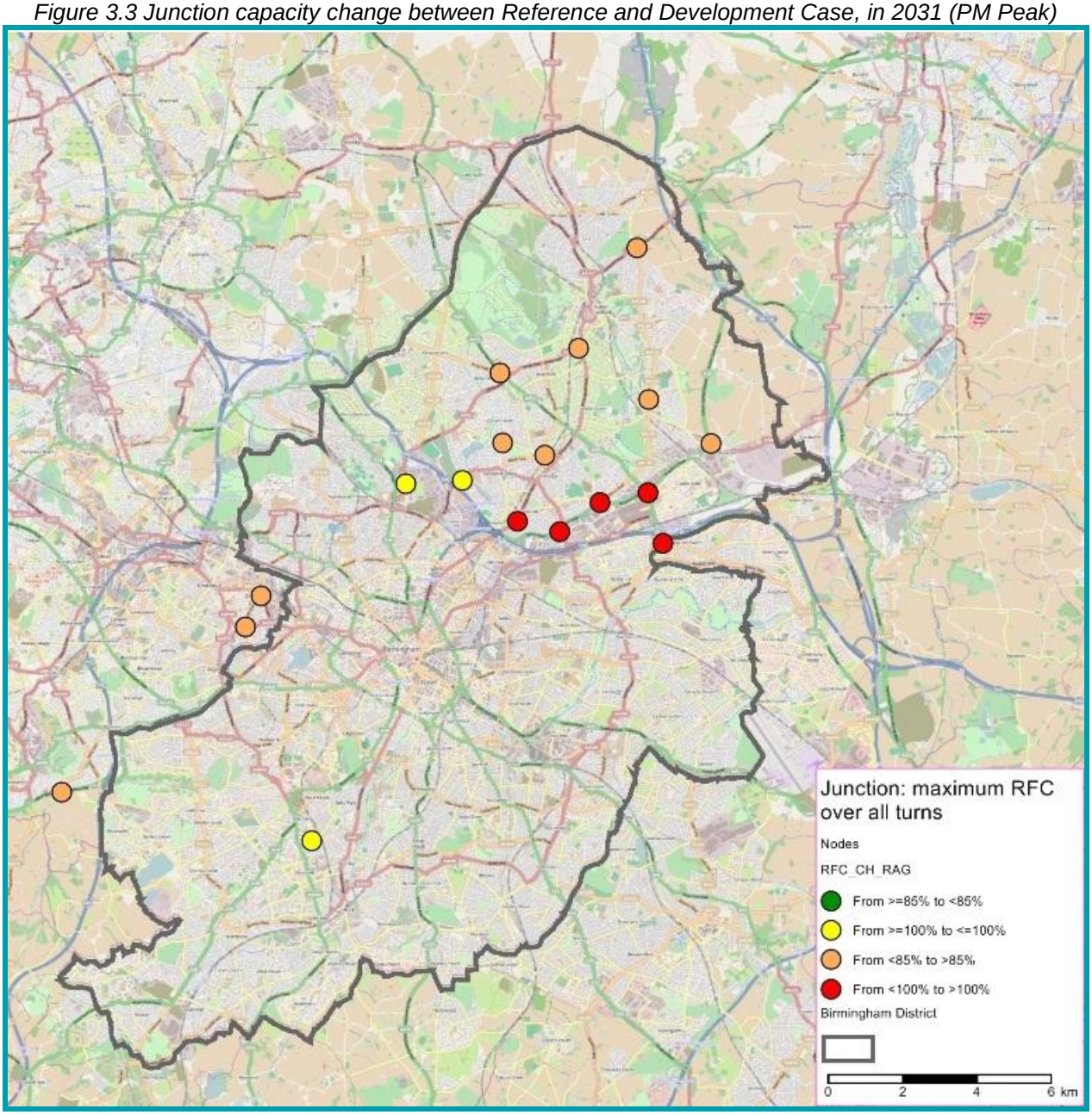


Figure 3.3 Junction capacity change between Reference and Development Case, in 2031 (PM Peak)



Flow increases were modelled additionally, with the difference in flows shown in F*igures 3.4* and *3.5*. The most significant flow increases being on the main local links between the green belt developments and surrounding urban areas, namely:

- A38 Kingsbury Road;

- Walmley Ash Road;
- Fox Hollies Road / Wylde Green Road;
- B4148 Walmley Road; and
- Ox Leys Road.

Figure 3.4 Flow change between Reference and Development Case, in 2031 (AM Peak)

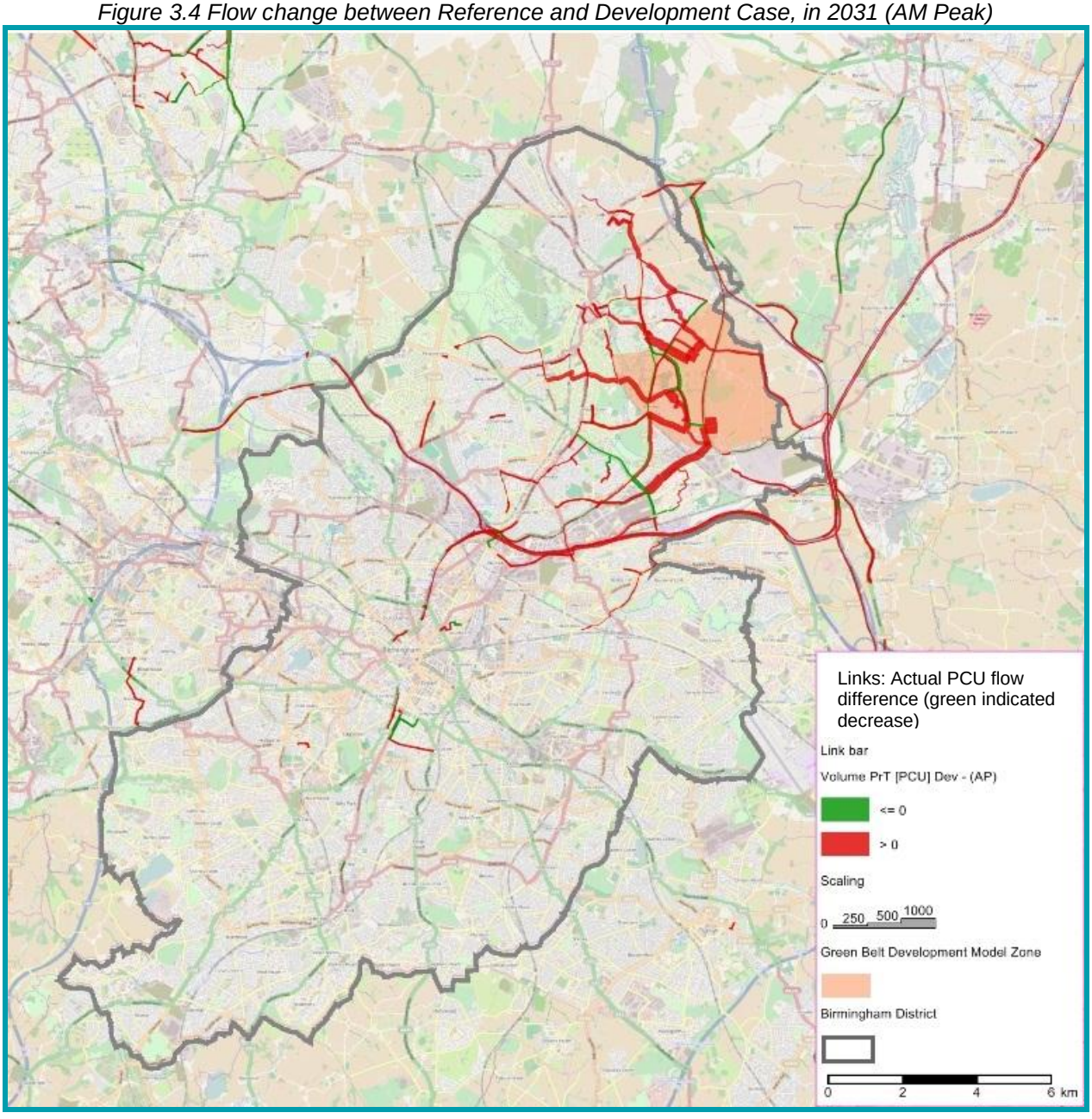
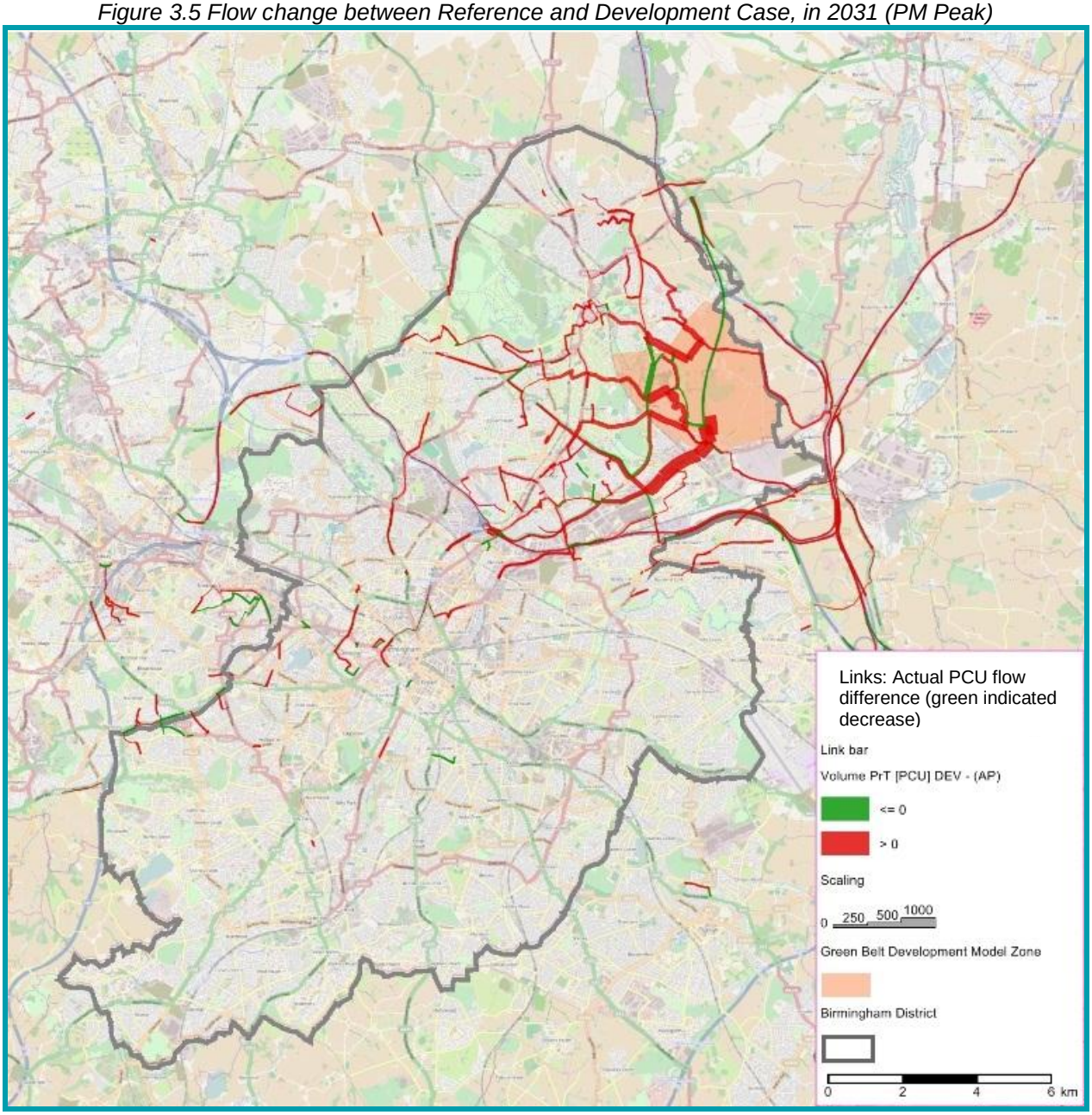


Figure 3.5 Flow change between Reference and Development Case, in 2031 (PM Peak)



Despite this increase in flow however, there are only small sections of network that experience a minor reduction in speeds; between Tyburn Island and the B4148 junction, and some local routes between Langley and Sutton Coldfield. In both peaks a speed ratio change of -0.1 is observed, reflecting small speed deterioration.

3.5 Summary

The results of this analysis have been used to create an emerging strategy to mitigate the impacts of the Sustainable Urban Extension (SUE) planned at Langley and Peddimore. This has been done through a range of highway interventions, and walking and cycling and public transport strategies. The specifics of these interventions have been developed, and are discussed in **Chapter 4**.

Green Belt Infrastructure

4 Green Belt Infrastructure

4.1 Introduction

Traffic modelling has shown that the Sustainable Urban Extensions (SUEs) at Langley and the Peddimore Employment Site will generate the following two-way person travel demand:

Table 4.1 Travel Demand Summary (Person Trips)

	AM Peak (08:00 – 09:00)	PM Peak (17:00 – 18:00)
Langley Residential SUE	5,653	5,641
Peddimore Employment Site	2,476	2,036

It is evident that the level of travel demand associated with the developments will result in increased congestion at already congested junctions in northeast Birmingham, as discussed and evidenced in **Chapter 3**. To be sustainable, the development needs to be supported by a transport network that accommodates the trips it generates, both within and outside the site. The provision of good connectivity is necessary for a development to attract and retain residents, and therefore become a vibrant neighbourhood. In this way, the travel demands and network effects of the development are mitigated. Similarly for the employment development to attract and retain business occupiers there has to be adequate accessibility for the workforce, and provision for the movement of materials and products.

Sustainability also requires that the movement generated by the new development does not significantly affect movement within existing neighbourhoods. It is important that these existing activities are sustained, and that the new development offers an enhancement to, rather than detraction from, the economic prosperity and the quality of life in the area.

The addition of new development can be an opportunity to improve transport conditions in the local area. This development, combined with the existing area, will provide a critical mass which will more readily justify investment in sustainable transport infrastructure. Short and medium distance sustainable journeys will be fully catered for, making best use of the existing infrastructure to make journeys into the built up area more attractive than longer distance car born travel out of, or around, the City. This creates a focus for investment in transport infrastructure, however it is also acknowledged that longer distance car journeys will be made, which will require physical remediation.

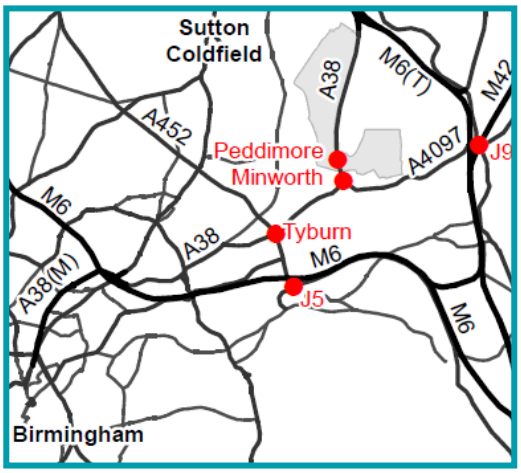
This section details the infrastructure that will mitigate this demand, and support the use of active modes and public transport. The principles outlined above have been observed in the formulation of a strategy to mitigate the new movement generated by the proposed development. Detailed highway junction modelling has been undertaken on several specific junctions, while further associated studies have reviewed impacts and potential schemes to the strategic road and rail network, public transport and active travel. In addition, the 'Green Belt Development Movement Infrastructure Plan' develops an overall strategy for the SUEs, analysing three key axes of movement.

4.2 Highway Modelling

Following the strategic modelling outlined in **Chapter 3**, a number of further studies have been undertaken to model potential improvements at a micro or junction level. Several junctions in the A38 corridor are expected to have significant increases in demand, or expected to be exceeding capacity if no mitigations are undertaken. In addition, junctions within the Strategic Road Network would also be affected due to the close proximity of the urban extensions to the M6 and M42. It was therefore essential to understand the specific impact that the growth has on these junctions, and the most suitable mitigation required to ensure continued operation post development. These studies and analyses are summarised below.

4.2.1 A38 Peddimore Access

This junction will be to the north of Minworth Island, and provides direct access into the green belt development sites from the A38. Four scenarios were modelled; do nothing (Option 0), two variants involving slip roads (partial and full access, Options 1 and 2), or an at-grade roundabout (Option 3).



Do Nothing did not have an adverse effect on Minworth Island (as the main access point), but local roads from the junction and the attractiveness of the employment site in particular would be impacted. Options 1-3 would result in the network operating at capacity, impacting on the A38 flows, and some traffic being unable to access the developments. A modified Option 3, with signal timing adjustments, shows some capacity issues, but generally shorter queues than other options, and is therefore the preferred option. The cost of the preferred option will be £12.7m.

4.2.2 A38 Minworth Island and Kingsbury Road

This junction is currently the first roundabout heading into Birmingham from the M42 J9. Currently, the junction is operating at capacity during the AM peak and within capacity during the PM peak. Future year modelling in 2031 found the junction would operate with severe queues on most approaches, and would be unable to accommodate any development traffic in either peak.

Options were then developed as mitigation measures; all options involved part-signalisation of the junction, with no widening, a 'hamburger' arrangement, and two options involving widening of approaches and the circulatory making up the four options considered. The preferred option involving widening of approaches and the circulatory, and rearrangement of several approaches and exits, resulted in the junction operating within capacity in both peaks. The cost associated with the preferred scheme is £3.1m.

In addition to improvements at Minworth Island, an option to enhance the operation of the Water Orton Lane / Kingsbury Road junction is proposed. The scheme would include two lanes along the Kingsbury Road East and West approaches, with the staggered crossing converted to a straight crossing on the East approach, and would cost approximately £0.6m.

4.2.3 A38 Tyburn Island

The Tyburn Island is the first junction after Minworth Island, heading into Birmingham. Currently, two and three arms of the roundabout are at capacity in the AM and PM peaks, respectively. Future year modelling in 2031 indicates severe queuing would occur in both peaks, with the junction operating at double its capacity at times.

Four options were developed and modelled, with performance, costs, benefits and risks all taken into account. The options included conversion into signalised crossroads, full signalisation, full signalisation with widening of approaches, or a 'hamburger' arrangement. Options 1-3 saw improvement over Do Nothing, with Option 4 discounted due to high statutory costs. It was found that Option 3 (full signalisation with improvements) had the best results in terms of delay, and provides a nil-detriment solution in 2031 relative to the 2009 level of service. The cost associated with the preferred option is £1.8m.

4.2.4 Strategic Road Network Impact Study

Birmingham City Council have worked in collaboration with the HA, Staffordshire County Council and Warwickshire County Council to understand the impact and associated mitigation required on the Strategic Road Network. Due to the location of Peddimore and Langley SUEs in association with the SRN (most notably M42 Junction 9), the HA sought clarity on the impact that the developments would have on their network. As a result, a Paramics model for

the junction and local highway network was built, and calibrated to a 2014 base year and forecast year 2031. The results suggested that the traffic specifically associated with the two SUEs has a detrimental impact during both the AM and PM peaks:

- During the AM peak, the main impact occurs along A4097 Kingsbury Road, where traffic associated with the developments results in extensive queuing from 7.30am. The associated traffic building up from vehicles turning right onto the M42 southbound results in extended queues along both Lichfield Road approaches from the north and south. Overall speeds in the traffic model reduce as a result of the development traffic.
- During the PM peak, congestion occurs along the M42 with and without the SUE development traffic. This congestion relates to queuing from a northbound lane merge along Lichfield Road to the north of Junction 9. Overall speeds with the traffic model are consistent with and without the SUE development traffic, suggesting that the development has little impact on the operation of the junction, should no improvements be made along Lichfield Road. However, should improvements be made to remove the bottleneck along Lichfield Road, the impact of the SUEs may become more apparent.

A mitigation option appraisal has been completed, whereby the following measures have been proposed to ensure full mitigation in 2031:

- Changes to the lane markings on the circulatory carriageway and approaches;
- Two lane exit onto M42 northbound on-slip; and
- Widening of A446 Lichfield Road northbound towards The Belfry.

The total outline cost of the proposals is approximately £3.5m. Following consultation with key stakeholders, it was agreed that in order to fund the required improvements at Junction 9 and the local highway network, a mechanism will need to be established to ensure appropriate sources of funding.

In addition to M42 Junction 9, Birmingham City Council has also examined the impact at M6 Junction 5. Due to its location to the south of the two urban extensions, there is an associated traffic impact that may require mitigation. However, with A452 Chester Road improvements currently being implemented, it is anticipated that the operation of the junction, and the adjacent M6 slip roads, will continue even with the BDP development traffic uplift. However, if the assessment suggests that increased queuing and delays at the junction is significant, and has a detrimental effect on the M6, mitigation options will need to be developed. As part of the strategic modelling (see **Chapter 3**), impacts on all the motorway junctions within the West Midlands have been considered. For full details, refer to the Stage 2 Hybrid Model Output report.

4.3 Rail Study

The Birmingham Eastern Fringe Rail Study, completed in April 2014, was undertaken to investigate the potential for new or enhanced rail services to support the delivery of the green belt development sites. It concluded that there is potential for the rail network to support developments in the area, through the reopening of the Sutton Park line and three new railway stations, a new station on the existing Water Orton corridor, or enhancing rail and parking capacity on the existing Cross City line. While there are challenges, mainly associated with capacity, these are not insurmountable.

All of these rail improvements will have an effect on Staffordshire, but three schemes in particular have been identified through the process of looking at the Green Belt sites. It has been concluded that Green Belt sites do not justify any new rail infrastructure in their own right.

Centro and Walsall MBC have developed a scheme to electrify the line between Aldridge and Walsall, which is supported by BCC. The line then extends (freight only) through Sutton Coldfield, Walmley to Water Orton where it joins the Birmingham – Tamworth mainline. CH2MHill were appointed to consider the feasibility of opening this as a

passenger line, to provide new stations at Sutton Coldfield, Walmley, Castle Vale and Fort Retail Park. However it was found that the obstacles to overcome are potentially prohibitive within the plan period. The recommendation of the report was to consider track capacity enhancements at Water Orton and consider a single new station at Castle Vale/Fort Retail Park. This will not be taken forward as part of the Green Belt development, but is supported by Birmingham City Council. This presents some accessibility improvements in the longer term for residents of Tamworth.

The Cross City Line is a route choice that many from the Green Belt sites might take. It is also recognised that residents of Lichfield and Tamworth depend upon the line and its Park & Ride facilities, which operate at capacity every day. Centro and Birmingham City Council continue to look for opportunities to increase the capacity of these facilities. The infrastructure strategy for the Green Belt sites will provide bus and cycle connections to the railway stations, to encourage sustainable multi-modal journeys into the City.

4.4 Bus Study

The Birmingham Eastern Fringe Bus Study investigates the potential for new or enhanced bus services to support the delivery of the proposed urban extension. Providing an examination of existing bus provision, and assessing the delivery and operation of proposed schemes, the study concludes with a number of recommendations:

- A network of new and revised bus services was devised to serve the proposed developments at Langley and Peddimore. Four services are proposed to run through the two developments:
    1. SPRINT Bus Rapid Transit: Sutton Coldfield – Langley – Peddimore – Castle Vale – Star City – City Centre;
    2. CityLink Bus: Sutton Coldfield – Langley – Peddimore – Castle Vale – Star City – City Centre;
    3. Service 71: Sutton Coldfield – Walmley – Langley – Peddimore – Castle Vale – Chelmsley Wood – Solihull;
    4. Service 75: Sutton Coldfield – Walmley – Langley – Peddimore – Coleshill – Airport/NEC.
- SPRINT BRT should be carried forward as the core service connecting Langley with the City Centre via the Bromford corridor, and with Sutton Coldfield town centre;
- CityLink bus should be carried forward as the core service connecting Langley with those parts of the Bromford Industrial Corridor that would be outside the SPRINT BRT walk catchment, and for connecting Peddimore with the Aston and Nechells;
- East Birmingham and North Solihull Link: Service 71 should be carried forward as the core service connecting Langley and Peddimore to East Birmingham and North Solihull;
- North Warwickshire and Airport/NEC Link: Service 75 should be subject to further investigation to determine its potential role as the core service connecting Langley and Peddimore to Coleshill, Birmingham Business Park, the NEC and Birmingham International Station and Airport;
- The proposed service 967, revised service 115 and other bus services in the vicinity of the proposed developments should be investigated further to refine the proposals to compliment the new and revised services;
- Patronage forecasts should be prepared using the PRISM travel demand model; and
- The proposed revised bus services should be appraised in terms of the transport connectivity and capacity provided, reductions in private car travel in future years, and financial viability.

It is accepted that some kick-start funds (approximately £3m) will be required to enable services to come on line as the development progresses, but the objective is that these services become self-sustaining as soon as possible and remain so in perpetuity.

4.5 Walking and Cycling Analysis

The attraction of travel on foot and bicycle is directly affected by the condition of the local infrastructure. While this can be overcome at relatively low cost, detailed local knowledge is required to identify the problem and devise an appropriate solution.

A strategic plan of this nature cannot address such detail, and the input of knowledgeable local parties will be appropriate and valuable. At this stage, consideration is more focused on the scope of the cycling proposals, in terms of their geographic coverage and the particular journey purposes on which modal shift to walking and cycling should be focused.

4.6 Proposed Infrastructure

The 'Green Belt Development Movement Infrastructure Plan' has been written to generate a movement strategy for Birmingham's Eastern Fringe, including the Peddimore (Growth Area 6) and Langley (Growth Area 5) SUEs. **Figures 4.1** to **4.3** demonstrate the geographical spread of the corridors that will require intervention, for the three groups of modes. The strategy focuses on walking and cycling for local movements plus supporting public transport provision including to / from Sutton Coldfield town centre; on public transport for movements to / from the Bromford Corridor and City Centre with supporting cycling provision; and recognises that private car will be a vital mode of travel to / from North Solihull, Staffordshire and Warwickshire with some opportunities for cycling and public transport. **Appendix E** provides a detailed summary of proposed schemes associated with the two SUEs, and the associated costs.

Figure 4.1 Highway Intervention Corridors

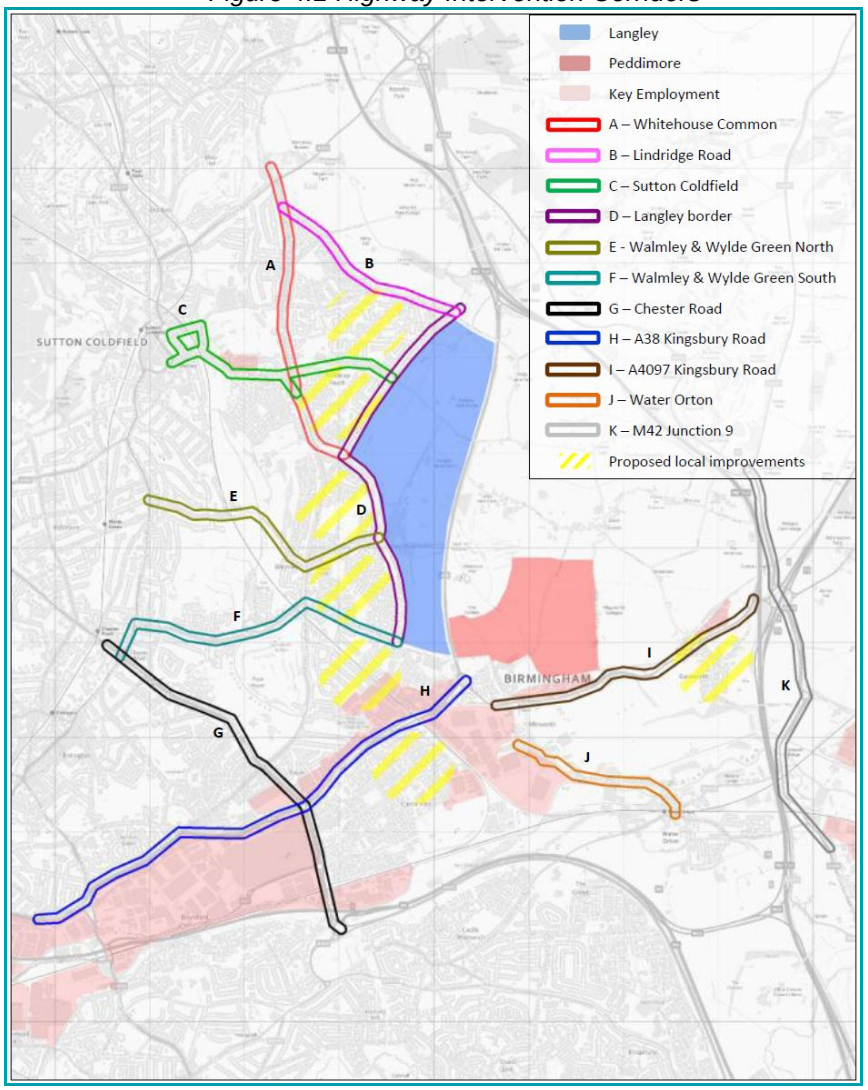


Figure 4.2 Walking and Cycling Network

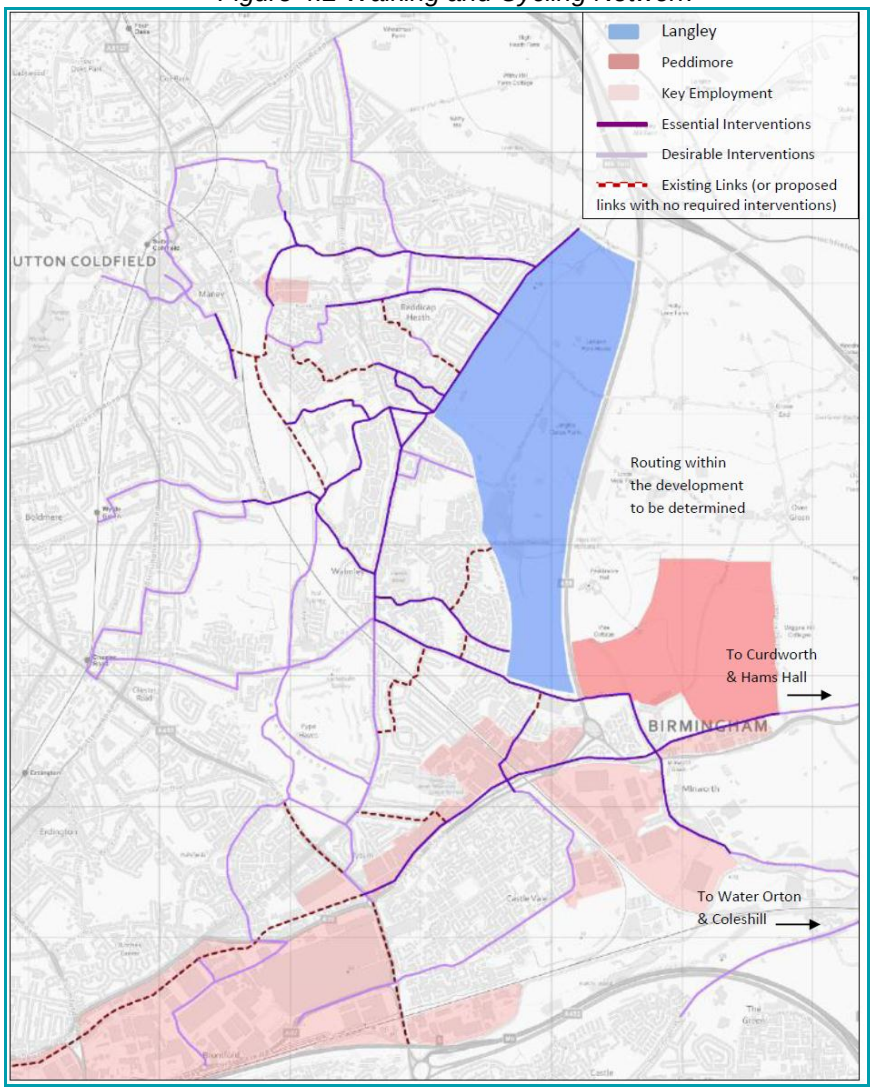
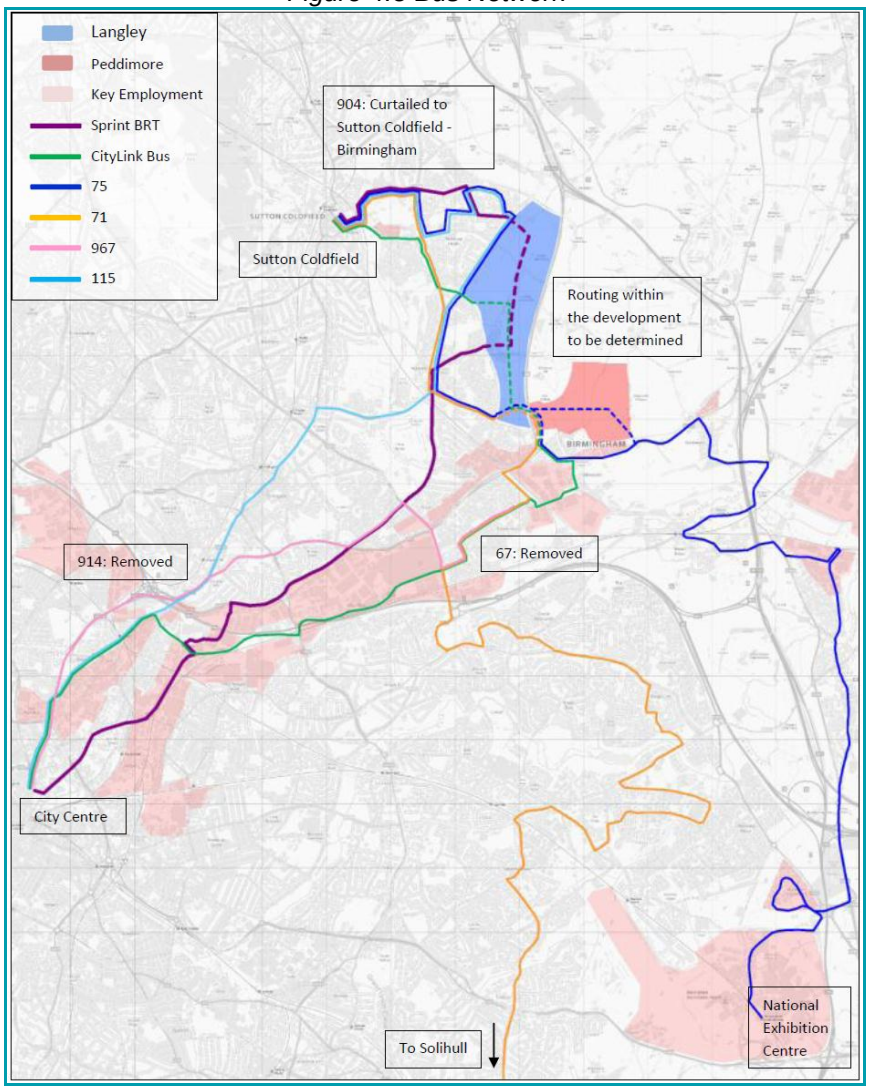


Figure 4.3 Bus Network



4.6.1 Local Routes to Sutton Coldfield, Walmley and Minworth

It is vital that the local network is adequately planned to reduce demand for longer trips by more unsustainable modes. The aims of this movement axis encompass the desire to support Sutton Coldfield town centre, and support good community cohesion and accessibility to local facilities, all primarily through modes other than the private car. The objectives focus on accommodating the increase in travel-to-work trips with particular emphasis on walking and cycling, supported by public transport, with no significant increase in average journey times. Furthermore, barriers to active travel should be removed through measures such as reducing actual and perceived danger of motor traffic.

The following increases in person trips per peak hour are expected:

- 200 between Langley and Sutton Coldfield town;
- 250 between Langley and Minworth plus Peddimore;
- 2,000 from areas other than Langley to Peddimore; and
- 75 additional peak hour trips by heavy goods vehicles.

The proposed infrastructure to mitigate this extra demand, and meet the aims and objective are outlined below.

Figure 4.4 Infrastructure to Sutton Coldfield, Walmley and Minworth

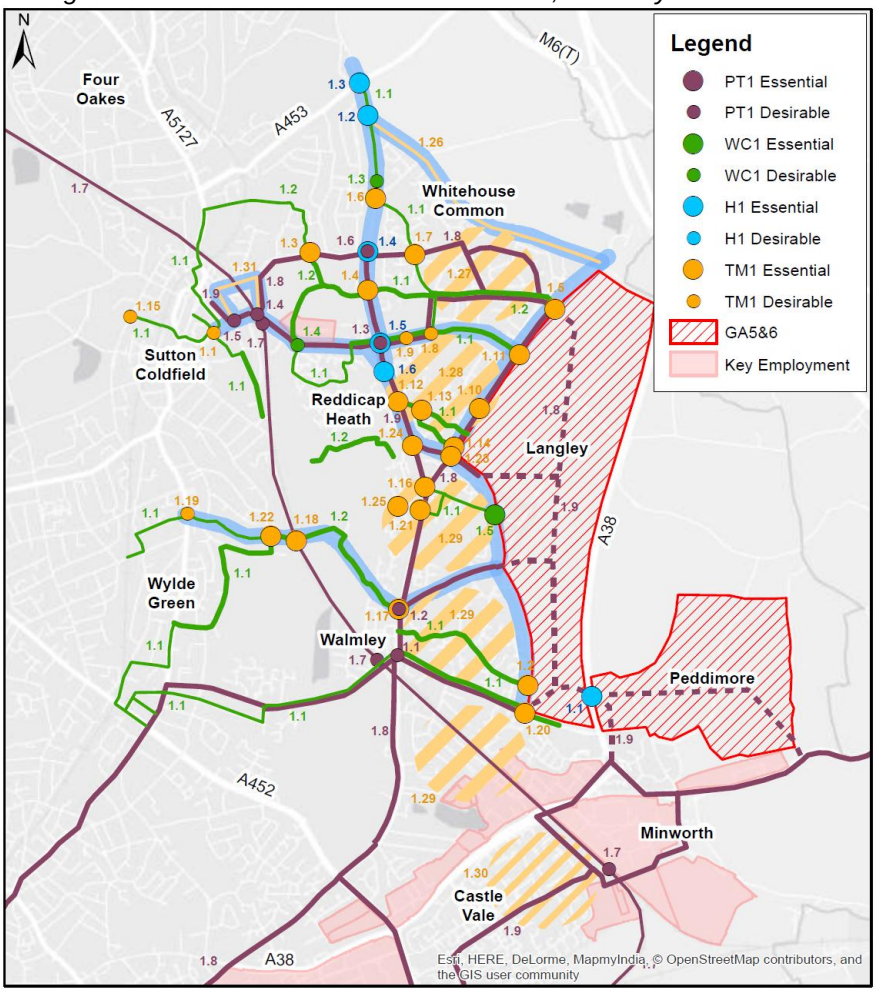


Table 4.2 Proposed Infrastructure (Sutton Coldfield, Walmley and Minworth)

Mode	Ref. Number	Infrastructure / Proposals	Policy
Public Transport	PT1	Sprint bus rapid transit service to link Langley with Sutton Coldfield, Good Hope Hospital and Walmley local centre (£11.68m for whole route and associated infrastructure – for full details, refer to the Birmingham Eastern Fringe Bus Study).	TP37, TP40, TP44
		CityLink bus service to connect Langley with Sutton Coldfield, Reddicap Hill, Peddimore, Minworth and Castle Vale (£2.57m for whole route and associated infrastructure – for full details, refer to the Birmingham Eastern Fringe Bus Study).	
		Bus service 71 and 75 re-routed to provide additional links between Langley and Peddimore.	
Cycling and Walking	CW1	Direct and coherent walking and cycle routes radiating from Langley in all directions forming a network that promotes ease of use and access.	TP37, TP38, TP39, TP44
		Cycle routes comprising of segregated paths, quiet residential areas and traffic management interventions on carriageways to enable shared space that is, and is perceived to be safe.	
		Direct, grade separated connections between Langley and Peddimore (£0.68m).	
Highway	H1	New at-grade roundabout on the A38, to the north of Minworth junction (£12.71m).	TP43, TP44
		Lindridge Road / Whitehouse Common Road junction improvements and Lindridge Road traffic management (corridor B).	
		Tamworth Road / Whitehouse Common Road and Whitehouse Common Road / Rectory Road junction improvements (corridor A).	
		Hollyfield Road / Reddicap Heath Road and Walmley Road / Hollyfield Road junction improvements	
Traffic Management	TM1	Physical and technology-driven urban traffic management control measures (corridor C).	TP43, TP44
		Traffic Management Interventions (corridors A-E, local highways).	

4.6.2 Routes to City Centre, Bromford Corridor, and North and East Birmingham

This movement axis features two distinct employment centres – professional, retail and leisure jobs in Birmingham City Centre, with a greater proportion of manufacturing and wholesale jobs in the Bromford Industrial Corridor. Many of the proposals in the below table however address both destinations. The aim in this movement axis is to achieve a high share of travel by public transport from Langley, through comparable journey times on public transport to car, facilitating access to the railway network, as well as increasing vehicular capacity on key arterial routes to sustain reliable travel times for business travel, goods traffic and bus services.

The following increases in person trips per peak hour are expected:

- 700 between Langley and the Bromford Industrial Corridor plus City Centre.

The proposed infrastructure to mitigate this extra demand, and meet the aims and objective are outlined below.

Figure 4.5 Infrastructure to City Centre, Bromford Corridor, and North and East Birmingham

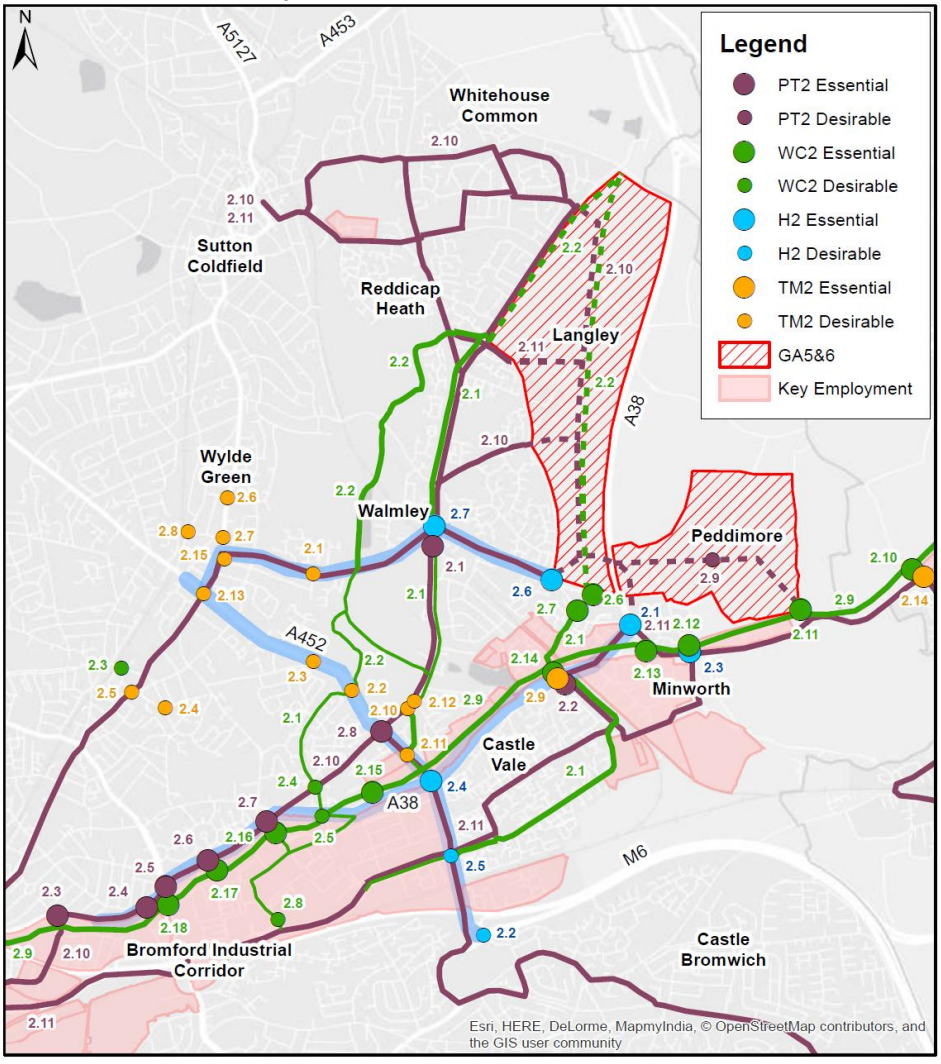


Table 4.3 Proposed Infrastructure (City Centre, Bromford, and North and East Birmingham)

Mode	Ref. Number	Infrastructure / Proposals	Policy
Public Transport	PT2	Sprint bus rapid transit from Langley to the City Centre via Walmley, Tyburn Road and Star City, with highway infrastructure and traffic management to achieve bus priority; will provide a substantial improvement in public transport connectivity and service quality along the corridor (£11.68m for whole route and associated infrastructure).	TP37, TP40, TP44
		CityLink bus service from Langley to the City Centre via Peddimore, Minworth, Castle Vale, The Fort, Star City and Aston (£2.57m for whole	

		route and associated infrastructure – for full details, refer to the Birmingham Eastern Fringe Bus Study).	
Walking and Cycling	CW2	Traffic management interventions at Walmley Ash Road / Penns Lane to control speed and smooth the flow of traffic, for inclusion in the cycle network.	TP37, TP38, TP39, TP44
		Enhanced cycle connectivity from Langley to Wylde Green, Chester Road and Erdington railway stations, for multi-modal journeys into Birmingham City Centre.	
Highway	H2	Improvements at Minworth Island (£3.12m), Tyburn Island (£1.79m) and Tyburn Road junctions with Kinsbury Road, Bromford Lane and Wheelright Road on the A38 (corridor H).	TP43, TP44
		Alterations to Chester Road / Eachelhurst Road (£0.75m as included within the SPRINT bus rapid transit cost) to increase capacity and accommodate a SPRINT bus rapid transit route. Further potential for further improvements at Spitfire Island at Fort Parkway, and Newport Island at M6 J5 (corridor G).	
		Potential for capacity enhancements along Walmley Ash Road at Webster Way, Eachelhurst Road, Penns Lane (including SPRINT proposals). Further traffic management at Yenton local centre (corridor F).	
Traffic Management	TM2	Traffic Management Interventions (corridors F-H, local highways).	TP43, TP44

4.6.3 Routes to North Solihull, Staffordshire and Warwickshire

This axis of movement is crucial to secure the viability of the Peddimore site, by facilitating a large workforce catchment area, including other neighbourhoods in East Birmingham and North Solihull. A further aim is to provide connectivity for Langley residents to jobs at Hams Hall, Coleshill, NEC, and Birmingham Airport. This will enable high prosperity and aid the economic recovery of the wider area by ensuring all jobs created are accessible to the areas of highest unemployment. The interventions below will connect Peddimore with the national strategic highway network, and provide improved capacity and connectivity by all modes to the rest of Birmingham, and the wider region.

The following increases in person trips per peak hour are expected:

- 900 between Peddimore and Warwickshire plus Solihull;
- 80 between Peddimore and Staffordshire; and
- 750 between Langley and Warwickshire plus Solihull.

The proposed infrastructure to mitigate this extra demand, and meet the aims and objective are outlined below.

Figure 4.6 Infrastructure to North Solihull

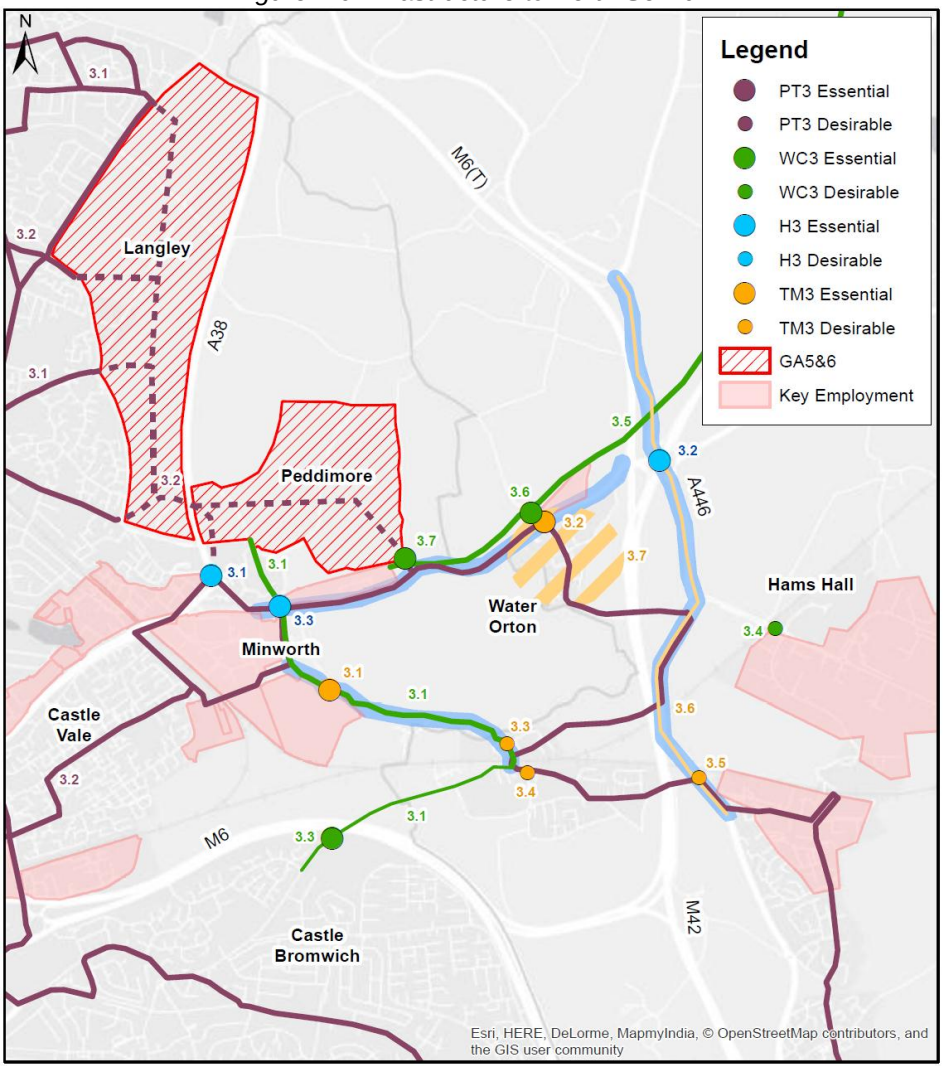


Table 4.4 Proposed Infrastructure (North Solihull, Staffordshire and Warwickshire)

Mode	Ref. Number	Infrastructure / Proposals	Policy
Public Transport	PT3	Service 71 to / from Solihull town centre via Chelmsley Wood re-routed via Peddimore and Langley south; interchange at Walmley local centre provides connectivity from / to Langley north (£11.68m for whole route and associated infrastructure).	TP37, TP40, TP44
		Service 75 to / from NEC via Coleshill re-routed via Peddimore and Langley south, and runs adjacent to Langley north.	
Walking and Cycling	CW3	Several routes are under consideration for improved walking and cycling facilities through use of canal towpaths (£2.3m), dedicated tracks, shared	TP37, TP38,

		use paths and traffic management interventions for on-carriageway cycle routes.	TP39, TP44
Highway	H3	Improvements to Kingsbury Road junctions at Minworth Island (£3.12m), Cottage Lane (£0.6m), Water Orton Lane, Coleshill Road and Wishaw Lane to enhance capacity and/or reduce traffic speeds. Potential for capacity increases at M42 J9 (approximately £3.5m) and the M6 Toll slips. Traffic management to discourage through traffic in Curdsworth Village (Corridor I).	TP43, TP44
Traffic Management	TM3	Traffic Management Interventions (corridors I-K, local highways).	TP43, TP44

4.6.4 Outline Transport Infrastructure Costs

As a result of the traffic distribution modelling and multi-modal analyses, a robust set of infrastructure has been identified to ensure connectivity between the two urban extensions and local and regional centres. This infrastructure has been set out in the 'Green Belt Development Movement Infrastructure Plan'. In addition to the identification of infrastructure, an outline cost has been calculated for each intervention and scheme to understand the level of investment required to provide sufficient multi-modal connectivity. The total cost has been estimated to be £67.47 million, as demonstrated and broken down by mode in **Table 4.5**, below. However, it is anticipated that these costs provide an outline only, with detailed cost estimates required during the design stage for each scheme. A more detailed breakdown of costs for each scheme has been provided in **Appendix E**.

Table 4.5 Outline costs by mode

	Estimated Cost	
	Essential	**Desirable**
Public Transport Infrastructure	£18.42m	£2.40m
Cycle and Pedestrian Infrastructure	£5.59m	£6.49m
Highway Infrastructure	£22.37m	£0.23m
Traffic Management and Highway Safety	£5.66m	£6.31m
	£52.04m	**£15.43m**

4.6.5 Outline Transport Infrastructure Funding

Schemes contained in the strategy will be delivered over a period of time commensurate with the build-out of the development proposals, in line with the BDP's 2031 time horizon. The timing of individual schemes would be matched to particular elements of the development, defined at a later stage.

Some elements could be delivered by the developer, particularly those partly or wholly within their site area.

In some cases, a piece of infrastructure or service might be funded from multiple developer contributions; the infrastructure would support the development as a whole and not be divisible between individual parcels.

In other instances, a scheme might have such economic development benefit that it is appropriate for the scheme to be progressed by public authorities and agencies, irrespective of these BDP development proposals. In such cases, it would be appropriate for these schemes to take account of movements generated by the proposed development. A funding mechanism might be used to attract a developer contribution; however, substantial funding from other sources would underpin the scheme.

4.7 Summary

The transport strategy for Langley and Peddimore is aimed at achieving a low car-driver share of travel. There would be an emphasis on walking and cycling for local journeys supported by public transport for travel into Sutton Coldfield town centre, and on public transport in particular for travel to/from the City Centre and Bromford corridor. For travel external to Birmingham, there would need to be increases in motor vehicle capacity so that business traffic, both people and goods, could have reliable travel times.

As well as supporting the proposed developments, the strategy outlined in this section will also deliver transport improvements for existing neighbourhoods, facilitating a modal shift from car to other modes. This is known as 'trip banking' and would release highway capacity to accommodate some of the additional travel generated by Langley and Peddimore.

The total cost of infrastructure has been estimated at £67.5m, of which £52.04m for schemes identified as essential, and £15.43m for those identified as desirable.

Birmingham Transport Strategies

5 Birmingham Transport Strategies

5.1 Introduction

This chapter provides an insight into a number of strategies that have been developed for Birmingham and the West Midlands that have been utilised to inform the BDP. The documents are outlined in **Appendix B**, along with several other key evidential documents that support the connectivity policies of the BDP.

5.2 **BMAP** - November 2013

BMAP[5] presents a twenty year vision for improving transport in the city. The Green Paper document sets out how the transport system will meet current and future challenges, through influencing travel behaviour and embracing technological change to reduce carbon emissions and improve road safety and health. It is envisaged that the White Paper will be completed by the end of 2014, following the completion of seven complimentary work packages that focus primarily on the delivery, funding and monitoring of mode specific strategies for the city. BMAP will complement the BDP in outlining improvements to the transport system throughout the city to ensure continued and improved mobility between and within the key Growth Areas.

5.3 **Birmingham City Centre Vision for Movement** - November 2010

The Big City Plan has set out the ambition for Birmingham to be a global and liveable city, in which new jobs, homes, and new cultural, civic and leisure opportunities are central to the city's future economic and social vitality. This document sets out the Vision for Movement[6] around and within the city centre and provides the key guiding principles that will underpin the Big City Plan. 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 key objectives are:

- Provide additional capacity for regeneration and economic growth in the city centre;
- Reduce our dependence on the private car and keep the city moving;
- The needs of pedestrians will be at the heart of the movement strategy for the city centre.

5.4 **Smart Network, Smarter Choices** – 2011 to 2015

Smart Network, Smarter Choices[7] is a package of measures that involves changing people's travel behaviour, while joining up transport networks through such initiatives as:

- Workplace travel planning, WorkWise and measures enabling people to make better informed sustainable travel choices, especially for shorter trips;
- Improvements to walking and cycling routes, passenger facilities and small-scale road and junction improvements to speed up journey times and improve punctuality; and
- Technology Showcase, working in partnership delivering real-time information, smartcards and using other sustainable information technologies to provide passengers with personalised, reliable, up-to-date information and ticketing services.

The initiatives currently being developed and implemented complements those outlined within the BDP, with a focus on delivering improvements across ten corridors across Birmingham and Solihull, the Black Country and Coventry by 2015.

[5] http://www.birmingham.gov.uk/bmap
[6] http://bigcityplan.birmingham.gov.uk/birmingham-city-centre-vision-for-movement/
[7] http://www.mynetwork.org.uk/

5.5 Intelligent Transport Strategy - December 2010

The Strategy[8] identifies where ITS can play a key role in supporting transport in Birmingham. The development of ITS will help the City Council improve on the efficient use of its existing road space and tackle road congestion, particularly along major road corridors in Birmingham during peak hours.

5.6 West Midlands Local Transport Plan 3 – 2011 to 2026

West Midlands LTP3[9] contains the Vision and Objectives, and sets out the overall Local Transport Strategy and the detailed policies required to deliver that Strategy. It covers the 15-year period from 2011 to 2026. It builds on the work already undertaken in preparing the Regional Transport Priorities, Regional Funding Advice, the development of Smarter Choices and our Sustainable Travel Cities submission, as well as the development of Core Strategies by the Metropolitan District Councils. It also reflects the aspirations of the Local Enterprise Partnerships. This Plan places a clear emphasis on delivering what is already committed, striking a balance between transport modes, concentrating only on strategic transport interventions and moving towards the development of smarter travel choices, and the better management and maintenance of our existing transport networks.

5.7 Towards a World Class Integrated Transport Network – April 2013

This report[10] looks at the public transport system, supported by a wider narrative on the critical roles of highways, freight, cycling, walking and land use planning to help us promote a truly integrated transport system. It aims to inform the development of a number of strategies and plans, including the development of LEP Growth Strategies and the Birmingham Development Plan, which has a comprehensive remit for the overall transport system serving Birmingham.

5.8 Rights of Way Improvement Plan – November 2007

The Plan[11] provides analysis of the local right of way for recreation and access to the wider transport network. A ten year plan of improvements is set out for each of the wards in Birmingham. The programme informs many of the strategies recently developed for Birmingham and has identified many of the walking schemes that will be developed as part of the BDP.

5.9 Birmingham Cycle Revolution – January 2013

A successful bid for DfT funding was completed in January 2013, summarising a 20 year plan to promote cycling within Birmingham. The bid[12] focusses on eight main arterial routes into the city centre, and a network of quieter routes linking local centres and facilities. It was announced in August 2013 the bid was successful, and Birmingham would receive £17m. It focused on investment in cycling infrastructure and facilities, building on our existing cycle network, making the best use of our canal network and green corridors and developing a comprehensive on-road network offering significantly improved cycling conditions. The document forms part of the connectivity evidence base as funding will be used to deliver some of the cycling schemes identified within the BDP.

[8] http://www.birmingham.gov.uk/futuretravel
[9] http://www.centro.org.uk/media/2559/LTP-strategy.pdf
[10] http://www.centro.org.uk/media/11162/exec_summary-Apr2013_smaller.pdf
[11] http://www.birmingham.gov.uk/rightsofway
[12] http://www.birmingham.gov.uk/cs/Satellite?c=Page&childpagename=Sustainable-Travel%2FPageLayout&cid=1223415457481&pagename=BCC%2FCommon%2FWrapper%2FInlineWrapper

5.10 West Midlands Metropolitan Freight Strategy – April 2013
The strategy[13] outlines six functions; to steer investment programmes, inform and advise land use planning, decision making by regional bodies (LEPs and LTBs) and future major schemes, outline a regional strategy for strategic transport assets for national bodies (Highways Agency and Network Rail), and to influence government policy development. It also summarises key issues and proposals across the West Midlands area, setting out a vision for freight by 2030.

5.11 Low Carbon Transport Strategy – January 2012
This document[14] outlines the strategy that will allow Birmingham to meet the carbon reduction targets outlined in the "Carbon Dioxide Emissions Target Baseline" report. Four key themes (Smarter Choices, Smarter Infrastructure, Smarter Technology and Effective Carbon Management Planning) will work together to meet a 60% reduction by 2026.

5.12 Car Parking Guidelines SPD – February 2012
The SPD[15] sets out of the car, cycle and motorcycle parking standards which will apply when planning applications for new development are considered. Most notably, the guidelines will be used when planning parking provision for developments throughout each of the 10 Growth Areas, as set out in the BDP. The process of seeking financial contributions from developers towards public transport improvements is also outlined.

5.13 Sustainable Communities Strategy – September 2008
This document[16] brings together a variety of partners to create a vision to make Birmingham a great place to live, learn, work and visit a global city with a local heart. This strategy sets out the single vision for the future of the city, which is the basis for all other strategies in the city, including the BDP and Big City Plan.

5.14 Birmingham's Smart City Vision – November 2012
The report[17] outlines the strategic vision and framework that will lay the foundation for building Birmingham's Smart City Roadmap. It presents a new frontier for innovation and enterprise where virtual and physical communities will thrive on collaboration, be supported to create and experiment; deliver new services in better, exciting and previously unimaginable new ways. Ultrafast digital connectivity, cloud technologies, mobile working will open up our workspace to the world and transform how we do business and deliver services making us an attractive place to work and locate; Smart City developments will create a range of new jobs and services and be recognised as a global test bed to trial new technologies and services.

[13] http://www.centro.org.uk/media/11254/Freight_Strategy_EXEC_SUMMARY-APRIL2013.pdf
[14] http://www.birmingham.gov.uk/cs/Satellite?c=Page&childpagename=Transport-Information%2FPageLayout&cid=1223373336892&pagename=BCC%2FCommon%2FWrapper%2FInlineWrapper
[15] http://www.birmingham.gov.uk/carparkingspd
[16] http://birmingham.gov.uk/2026
[17] http://www.digitalbirmingham.co.uk/city/about/smart-city-commission

Infrastructure Delivery Plan

6 Infrastructure Delivery Plan

6.1 Overview

In order to determine the infrastructure required to support the growth set out in the BDP, Birmingham City Council have completed two reports that complement each other in identifying infrastructure required to support growth, but also examine the viability and deliverability of the infrastructure:

- **Infrastructure Delivery Plan**; and
- **Site Delivery Plan**.

The Site Delivery Plan demonstrates that the overall spatial strategy set out in the BDP is deliverable. The Infrastructure Delivery Plan has informed the Site Delivery Plan as it identifies infrastructure requirements for specific sites, alongside wider delivery issues including land ownership, remediation, the need for demolition and environmental considerations. The following sections provide an overview of the two evidence reports, and the associated outcomes.

6.2 Infrastructure Delivery Plan

The Infrastructure Delivery Plan (IDP) forms a key part of the evidence base for the Birmingham Development Plan (BDP). Whilst the BDP sets out the spatial planning framework for the city up to 2031, the IDP identifies the key infrastructure projects necessary to support the City's growth aspirations. The document has been produced in consultation with officers at the City Council, statutory consultees and external stakeholders and organisations.

The IDP seeks to demonstrate that there are no major infrastructure constraints on delivering the level of growth set out in the BDP. Delivering these proposals will require appropriate supporting infrastructure to be put in place, including transport, open space, schools, utilities and health and leisure services. The following sections provide an insight into the transport proposals set out in the IDP.

The IDP is a live document, which will be amended over the plan period as new funding opportunities arise and infrastructure priorities change. The IDP will be reviewed at regular intervals post adoption to reflect these changes. The aims of the IDP include:

- assess existing infrastructure capacity and needs in the City in the context of the BDP proposals and identify the lead organisations to deliver and manage infrastructure;
- identify key infrastructure projects to support growth and costs for providing the infrastructure;
- align the implementation of the IDP with the aims and objectives of relevant local strategies/ partnerships; and
- identify any funding gaps for the delivery of the infrastructure projects, which justifies the need to adopt a city-wide CIL.

The following sections provide a summary of transport infrastructure identified within the IDP.

6.2.1 Highway Schemes

Birmingham's Strategic Highway Network (SHN) consists of a limited number of high capacity major routes that are critical in maintaining good accessibility within the City, be it directly to the City Centre or other key areas. One of the defining features of Birmingham is the presence of transport corridors radiating from the City Centre throughout Birmingham, which include the SHN and a number of other key routes.

Many of the Birmingham's centres are located within transport corridors, which include the A34, A38, A41, A45, A47, A435, A457, A441 and A5127.

There are various Highway Improvement Lines (HILs) across the City which safeguard land for the implementation of future highway and public transport schemes, many of which would support new development opportunities.

Limited elements of the SHN will need upgrading to meet the requirements of the BDP and these are set out below.

The West Midlands Metropolitan Area has developed a 'Policy Responsive and Integrated Strategic Model' (PRISM) to consider land use and transport interaction and to evaluate the implications of demand changes and supply changes such as the growth agenda in the BDP. This model takes account of recent developments across the Birmingham area and beyond, which will inform the IDP. HILs will continue to be reviewed to ensure they reflect the transport priorities of the Birmingham Development Plan. The following 'Key HIL Schemes' will be protected for transport improvements:

1. A4540 Ring Road Improvements;
2. A456 Hagley Road - Lordswood Road to Five Ways;
3. A457 Dudley Road - Spring Hill to City Road;
4. A38 Bristol Road - Selly Oak (Phase 1b, Selly Oak Triangle Improvements);
5. A4167 Highgate Road - Ring Road to Stratford Road;
6. A435 Alcester Road South - Hawkhurst Road to Warstock Road;
7. A5127 Gravelly Hill - Aston Expressway to Kingsbury Road (in relation to Green Belt expansion);
8. A4040 Station Road/Iron Lane – Stechford;
9. A4040 / A5127 Six Ways – Erdington;
10. A4040 Stockfield Road and Yardley Road to the Swan Roundabout;
11. A5127 Sutton Coldfield Relief Road to support the adopted Sutton Coldfield Regeneration Framework SPD;
12. B4128 Bordesley Green – Rapid Transit Route development;
13. Battery Way / Spring Road; and
14. A5127 / B4137 Lichfield Road - Aston Hall Road.

The highway improvement lines within the City relate to a number of the infrastructure projects identified in the IDP Schedule. In addition, there are a number of smaller-scale improvement lines which will continue to be protected.

In terms of the proposed Langley SUE and Peddimore development, highway improvement works, including a new access road off the A38, would need to be delivered before development is operational. In addition to this, transport corridors connecting the sites with Sutton Coldfield, Birmingham City Centre and adjoining residential areas will need to be upgraded, as will key links into parts of Staffordshire and Warwickshire. Minor routes which are adversely impacted by increased traffic as a result of the development will also require mitigation in the form of traffic calming or other similar measures.

Impacts and potential improvements to the Strategic Road Network (SRN) will need to be fully investigated in partnership with the Highways Agency and adjoining local highway authorities. An existing impact assessment of the M42 Junction 9 demonstrates that Peddimore and the Langley SUE would have an adverse impact on the operation of the junction during peak periods. As such, a number of mitigation options have been explored to ensure reduced impact on the SRN and the local routes which intersect with it (i.e. A446, A4097). Going forward, a mechanism will be put in place to ensure the appropriate delivery of the preferred scheme, and to agree funding streams and contributions. The development will need to contribute towards the costs of the scheme, particularly improvements associated with access to/from Curdworth.

Further work is also ongoing at M6 Junction 5 to ensure continued operation post development. Birmingham City Council will work in partnership with the HA, to ensure a collaborative approach. More detail on these infrastructure requirements is provided in the IDP Schedule.

6.2.2 Rail Schemes

6.2.2.1 Passenger Rail

Network Rail own and manage the country's rail infrastructure, including the tracks, signalling systems, tunnels and other core assets. Network Rail also own and are responsible for the long term maintenance of most of the stations in the West Midlands and manage the Region's largest station at Birmingham New Street. All other Birmingham stations are currently managed by London Midland apart from Birmingham Moor Street, which is managed by Chiltern Railways.

A number of improvements are committed for this period, which include Birmingham New Street Gateway (under construction) and works have or will be undertaken at several stations throughout Birmingham to make them DDA compliant, including Northfield, Selly Oak and Sutton Coldfield. The IDP Schedule highlights projects which relate to Control Periods 5 and 6. Network Rail is currently involving local stakeholders, including the City Council, in its Long Term Planning Process (LTPP) which seeks to assess potential demand and high-level conditional outputs for passenger and freight services over a 30 year timeline to 2043. This will inform more detailed planning for development of the rail network in CP6 (2019-24) and beyond.

Train peak capacity continues to be an issue across the West Midlands where passenger numbers have increased by 94% between 2000/1 and 2011/12. As a result of this, meeting future passenger demand is likely to be challenging. The Department for Transport's High Level Output Specification has specified the delivery of an additional 10% morning peak capacity between 2014 and 2019. However, this is significantly below the levels of background passenger growth currently being experienced.

There are a number of railway lines that run through the City, including the Coventry Line (part of the WCML, which provides direct links to Birmingham Airport and NEC), the Cross City Line, the Walsall Line and the Snow Hill Line.

Centro manage a number of Park and Ride sites within the City that are linked to suburban rail stations. These Park and Ride sites collectively provide 2,242 parking spaces and include Acocks Green, Blake Street, Chester Road, Four Oaks, Hall Green, Kings Norton, Lea Hall, Northfield, Selly Oak, Sutton Coldfield, Wylde Green and Yardley Wood.

There is an issue with rail service provision in some areas of the City. The Coventry Line now has a reduced service frequency at some stations in order to accommodate 3 Virgin Pendolino trains per hour between Birmingham and London. There are no local train services to existing stations on lines from Birmingham to Tamworth and Nuneaton. There are no local stations or local passenger services on the:

1. Camp Hill Line (Kings Heath, Hazelwell, Moseley)
2. Water Orton Line (Fort, Castle Vale)
3. Sutton Park Line (Walmley, Sutton Park)

Some service frequencies between Birmingham and centres outside of the City remain poor (including Milton Keynes, Worcester, Stratford-upon-Avon, Cardiff, and Glasgow), whilst journey times to other destinations (including Manchester, Nottingham and Yorkshire) remain comparatively slow.

6.2.2.2 High Speed 2

Connectivity to the wider Region and beyond is key to Birmingham's economic competitiveness, and this will be significantly enhanced with the implementation of HS2, which is currently being progressed by Central Government. HS2 will deliver much needed enhanced rail capacity and connectivity between the West Midlands and Britain's other major conurbations, placing Birmingham at the heart of a new national high speed rail network.

The first phase of HS2 will link the West Midlands with London

and the existing HS1 line. Two new stations will be created in the West Midlands, one in Birmingham City Centre (adjacent to the existing Moor Street Station) and one in Solihull (Birmingham Interchange), which will be connected to Birmingham Airport, the National Exhibition Centre and Birmingham International station. Work on phase 1 will start in 2017, with completion expected in 2026.

The second phase of HS2 will link Birmingham with Manchester, East Midlands, Sheffield and Leeds by 2032/33. There will also be through services from Birmingham to destinations on the existing rail network such as Newcastle and Scotland which will be provided by trains capable of running on both HS2 and the "classic" network.

6.2.2.3 Freight Rail

The efficient movement of freight is important to Birmingham's economy. Over recent years it has become more cost effective to transport certain items e.g. bulk materials, aggregates and large volumes of non-perishable goods by rail. At the same time the environmental credentials of rail are also increasingly being used to encourage its use as a lower carbon alternative to road freight.

The West Midlands rail network is a predominately twin-track, mixed-use network carrying passenger and freight services. At the centre point of the UK's rail network, the West Midlands experiences a significant level of 'through' freight trains as well as freight trains accessing freight terminals in and around Birmingham and the wider metropolitan area. There are a number of active railfreight facilities in the city at Landor Street, Small Heath (Tyseley), Castle Bromwich and Washwood Heath, although the latter is impacted by the proposed Rolling Stock Maintenance Depot as part of HS2. Freightliner Ltd at Landor Street handles 16 daily Freightliner services to and from the UK's deep sea ports.

The BDP encourages a more sustainable pattern of transport use, and new development will require improvements in rail provision, new stations where appropriate and the re-instatement of passenger rail services on some lines would assist with modal shift and help alleviate congestion on the highway network. The BDP also recognises the need to support access to and facilities around railway stations to encourage use and meet the needs of users. Specific projects are identified in the IDP Schedule, the majority of which are regarded as essential to supporting the growth of Birmingham. These projects include:

1. Birmingham New Street Station upgrade to mitigate increased passenger numbers and provide an enhanced 'Gateway' to the city region. The Midland Metro expansion, which is currently on site, will link the new station with Corporation Street, Colmore Row, Snow Hill Station, Jewellery Quarter and the existing Metro Line 1 to the Black Country. Works are also due for completion in 2015. This project is fully funded.
2. Perry Barr Public Transport Hub, which will create a bus and rail public transport interchange within the heart of Perry Barr/ Birchfield District Centre. Funding opportunities are currently being explored.
3. The recently established Greater Birmingham and Solihull Local Transport Board has short-listed the 'One Station' project, which will improve the public realm between New Street Station and Moor Street Station (and the proposed HS2 station), in terms of quality and function as an efficient transport interchange space. The project is fully funded.
4. Snow Hill Line Enhancements (platform 4) project will improve transport network capacity, connectivity and increased access to labour market and businesses. Funding opportunities are currently being explored.
5. Sutton Public Transport Interchange, which would be located in proximity to the railway station (site to be confirmed), enabling more convenient multi modal sustainable journeys. Funding opportunities are currently being explored.

The IDP Schedule also refers to a number of desirable projects, which would support the growth aspirations and sustainability objectives of the BDP and will be delivered should appropriate funding become available. These include:

1. The Camp Hill Chords project, which would enable two new suburban rail lines to be run into Moor Street Station – one from Kings Norton through Kings Heath and Moseley and one from Tamworth through Kingsbury, Castle Vale and Fort Parkway. As there are currently no local stations or local passenger services on these lines, this proposal would address this deficiency and would support wider housing and employment growth. Sutton Park Line has been assessed and is not essential to deliver development in the green belt.
2. Environmental and access improvements to rail station and services across Birmingham, including Cross City Line, West Coast Main Line and Marylebone Line.

The need for frequent and improved rail services in areas of housing and employment growth is recognised. The City Council will continue to work with Centro and other partners to ensure that projects key to delivering growth are progressed. The IDP Schedule details progress with the above projects in relation to timescales, cost and funding sources. Whilst HS2 is likely to be delivered towards the latter part of the plan period, it will deliver significant economic benefits for Birmingham and the wider Region. It will reduce journeys times to the capital with particular benefits for the commercial and business sector in the City Centre. In addition, HS2 will also release capacity on the WCML for more local services, which will positively impact on a number of the Growth Areas in the BDP, including Bordesley Park and wider east Birmingham.

6.2.3 Rapid Transit and Bus Network

Birmingham benefits from a comprehensive bus network, with services being provided by a number of different operators; principally by National Express West Midlands. Centro broadly works to a set of access standards to ensure that residents of the West Midlands have convenient and easy access to a frequent local bus service.

Bus service provision is generally comprehensive throughout Birmingham. However, it is not always possible to provide direct services for all passengers to all areas. Centro seeks to ensure that journeys can be completed through a minimal number of changes between services.

Where key interchange points have been identified Centro look to provide facilities at these locations, including bus shelters and an enhanced level of information provision. Where gaps in the network are identified Centro works with operators to identify any commercial opportunities or consider subsidising additional services.

The development proposed in the BDP will result in a greater number of trips within the City and beyond its boundaries and it is essential that public transport provision is enhanced and new services introduced to encourage people to travel in a sustainable way. A number of infrastructure projects are highlighted below (and in greater detail in the IDP Schedule), which will help to support and deliver the growth aspirations in the BDP. The essential projects to support growth include:

- The extension of Midland Metro Line 1 is currently on site and will take Midland Metro from its current terminus at Snow Hill and extend it into the heart of the city to New Street Station. This route will ensure that high quality public transport links serve and support the 'New Street Gateway' scheme and maximise the benefits of the regeneration of the station and the surrounding area. The project is fully funded.
- Metro extension - New Street Station to Centenary Square (including re-design of Centenary Square). This project would improve connectivity, increase capacity, reduce congestion and support the viability of existing and new developments at Paradise Circus and within the Broad Street/Brindley Place entertainment and office quarter. The project is fully funded.

The IDP Schedule also refers to a number of desirable projects, which would support the growth aspirations and sustainability objectives of the BDP and will be delivered should appropriate funding become available.

These include:

- Hagley Road SPRINT - scheme relates to the National Express West Midlands/Centro partnership agreement “Transforming Bus Travel Plus”, which gives a commitment to implement the first SPRINT route serving

Birmingham City Centre by 2016. This major project has been shortlisted by the Greater Birmingham and Solihull Local Transport Board, with the potential to deliver on site between 2015-2019. The project is majority funded.

- The West Midlands LTP3 Implementation Strategy (2011) includes a rapid transit route connecting Birmingham City Centre and Birmingham Airport, which would serve development and regeneration sites in the City Centre (including Eastside), Bordesley Park, Meadway, Birmingham Business Park and the NEC, before connecting to the airport. The proposal would also serve HS2 stations in Birmingham and Solihull. Funding opportunities for a rapid transit route through the east of the City are currently being explored and this rapid transit route could take the form of Metro or SPRINT.
- Centro's 'Integrated Transport Prospectus" sets out further rapid transit proposals serving Birmingham, which could take the form of Metro or SPRINT. In some cases, SPRINT may be delivered in the short-term followed by a longer-term proposal for Metro. Rapid transit proposals include the City Centre to Walsall (via A34, Walsall Road) and City Centre to Maypole, with the potential for a park and ride facility at Maypole. The above projects are identified in the IDP Schedule.
- Policy TP40 refers to the expansion of a number of park and ride sites across the city, including Kings Norton, Four Oaks and Lea Hall. However, as patronage levels increase over time, and to encourage modal shift, additional sites may be identified within Birmingham and existing sites expanded.
- Centro and the City Council have been working collaboratively on a Statutory Quality Partnership Scheme (SQPS), which has been introduced in the City Centre. The SQPS commits partners to adhering to operational standards, such as vehicle quality, information provision, bus stop infrastructure and the provision of enforceable bus lanes. Highway schemes to provide bus priority, alleviate congestion and improve reliability and punctuality also form part of the agreement. Good and reliable bus services are key to the City Centre's local economy, and the SQPS will ensure that standards in service delivery are maintained which is particularly important given the scale of development proposed in the City Centre, including the Enterprise Zone.

6.2.4 Walking and Cycling

The provision of a pleasant walking environment has a significant role to play in supporting quality of life in the city, and it is recognised that high quality walking routes need to be provided both within built up areas and throughout parks and greenspaces. Birmingham is committed to encouraging walking as a means of getting around the city, and the City Council has delivered a range of public realm improvements over recent years with a view to ensuring that walking is a safe and attractive option.

Cycling has the capacity to deliver on key City Council objectives: carbon reduction, relief of traffic congestion (and the economic costs of), health improvement, improved liveability and an increase in children's independent mobility. Cycling, however, is still at a low level in Birmingham, comprising some 1-2% of trips. It is generally acknowledged that this is due to a cycling environment that is perceived as hazardous by the majority of the population. In order to encourage greater cycle use, this poor safety perception has to be improved by reducing the proximity of motor vehicles in locations where flows and speeds are relatively high.

Birmingham has a certain amount of cycling infrastructure, but this is characterised by a number of off-road routes and canal towpaths. There is a relative lack of infrastructure to provide a comfortable cycling environment on busier roads. These roads tend to be the most well-known and direct routes to major destinations, and use of them is almost unavoidable for some part of any urban cycling journey. An additional series of quiet parallel back street routes are also required for those new to cycling or

those who prefer a quieter journey. Significant lengths of canal towpaths require upgrading with sealed surfaces and the completion of the off-road (green corridor) network is also required. Greater cycle parking and cycle hire facilities are required to encourage cycle use.

As pedestrians are at the top of the road user hierarchy, the BDP contains specific policy (TP38) to promote the provision of safe, pleasant walking environments throughout Birmingham. Pedestrian routes as part of new development will be both direct and overlooked and existing routes will be improved to ensure safe and secure walking environments. The City Council will continue to work with partners, including Centro, to make it easier and safer to walk to bus stops, train stations and Metro stops.

The 'Smart Network, Smarter Choices' project, which is funded by the Local Sustainable Transport Fund, aims to help people travel in a more sustainable way , which not only reduces impact on the environment but also improves peoples health and well-being. A number of walking related projects are identified in the IDP Schedule, including 'Improved City Centre Connections' and 'Smart Network, Smarter Choices Corridors: Phase 2'. Improvements to green infrastructure over the plan period will also enhance walking routes in parks, open spaces and along the canal network.

The importance of cycling and other sustainable modes of travel are promoted in the BDP to encourage modal shift and improve accessibility. Policy TP39 specifically refers to cycling and Policy TP44 refers to cycling in relation to accessibility standards for new development. These policies will ensure that cycling infrastructure is delivered as part of growth proposals, including Greater Icknield, Longbridge, Bordesley Park, Selly Oak, Perry Barr, Aston (Regional Investment Site), Sutton Coldfield and the eastern growth corridor.

Cycling accessibility will also be promoted in the more deprived areas of the city, enabling access to employment opportunities, whilst also improving people's health and well-being. In addition to enhancing the public cycle network, developers are also required to provide cycle parking for staff and visitors at 'trip end' facilities, which will be identified in green travel plans and the City Council's 'Top Cycle Location' programme.

Current programmed provision is highlighted below, which positively relates to the Growth Areas identified in the BDP:

- Bike North Birmingham infrastructure in Erdington and Sutton Coldfield.
- Local Sustainable Transport Fund funded 'Smarter Networks, Smarter Choices' corridors.
- Completion of the Cole Valley Route in East Birmingham.

A comprehensive network of cycling provision under the banner of Birmingham Cycle Revolution (BCR) has been developed and the City Council has recently secured £17m from the Cycle City Ambition Fund for phase 1 of the project. The City Council is also committing £7.3m to enable the first phase to be delivered. The BCR network will form the basis of cycling infrastructure development through to 2031. It comprises:

- Main corridor routes;
- Parallel back street provision;
- Green corridors; and
- Canal towpath upgrades.

6.2.5 Summary of Proposed Schemes

Table 6.1 provides a summary of schemes proposed with each of the ten Growth Areas and elsewhere within the city boundary. Full details for each scheme are provided within the IDP report.

Table 6.1 BDP Proposed Infrastructure

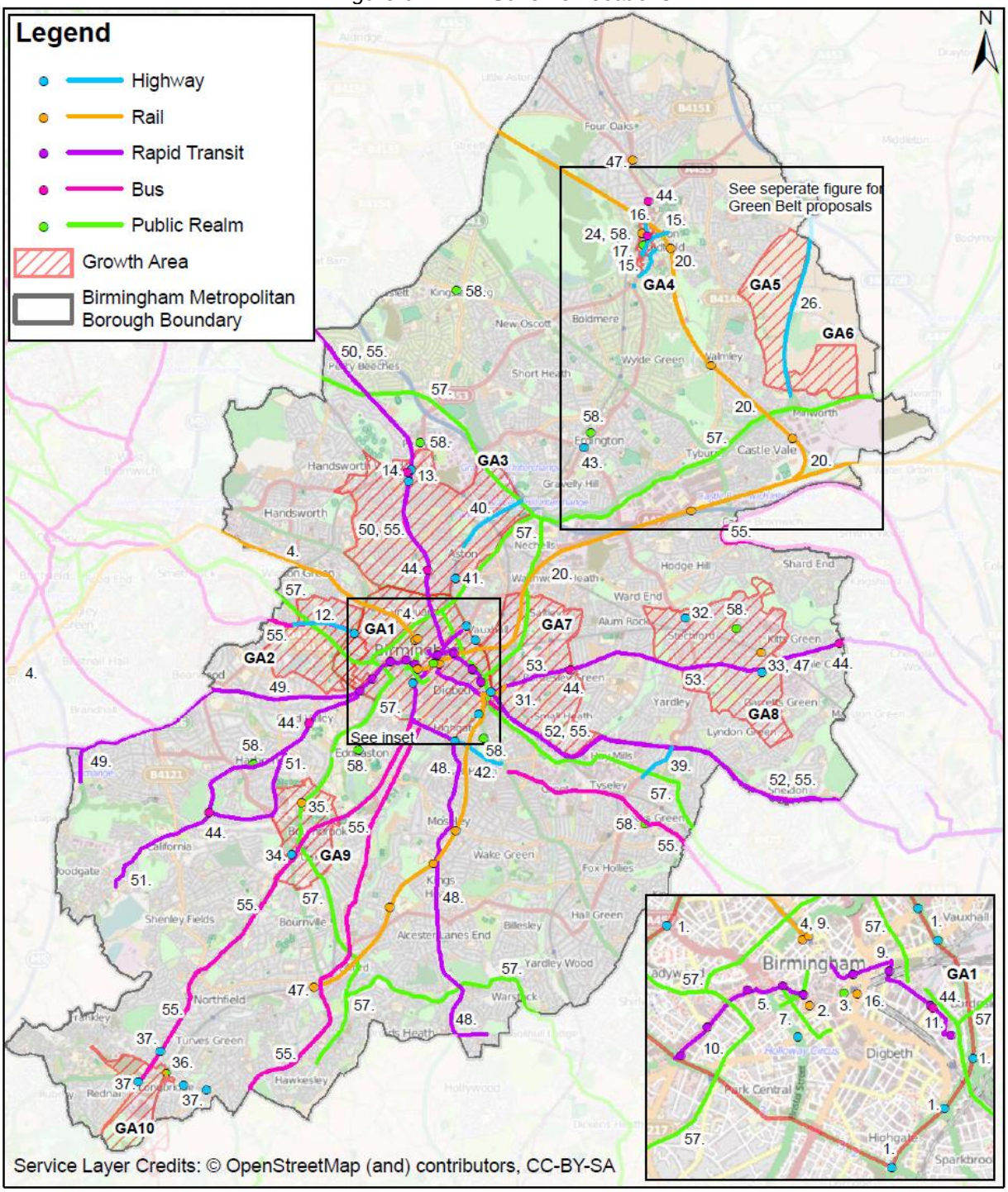
Location	Ref. Number	Connectivity Infrastructure	Scheme Cost	Policy
City Centre	1	Birmingham Ring Road project	£13.8m	TP43
	2	Redevelopment of New St Station	£600m	TP40
	3	One Station Public Realm Enhancements	£5.5m	TP38/39
	4	Snow Hill Line Enhancements	£20.5m	TP40
	5	Metro Extension (New St to Centenary Sq.)	£42.4m	TP40
	6	Improved City Centre connections	£24m	TP38/39
	7	Making the Connections for Growth	£8.0m	TP38/39
	8	Wayfinding, Signage and Information Package	£3.1m	TP38/39
	9	Snow Hill Station redevelopment Phase 2	£10m (£2.7m*)	TP38/39 /40
	10	Metro Extension (Centenary Sq. to Edgbaston)	£67.5m	TP40
	11	Metro Extension (Eastside/HS2 Station)	£103.5m	TP40
Greater Icknield	12	Dudley Road Highway Improvements	£30m	TP38/39 /43
Aston, Newtown and Lozells	13	Perry Barr highway improvement works and public realm	£8.6m	TP38/39 /43
	14	Perry Barr Public Transport Hub	£8m	TP40
Sutton Coldfield	15	Sutton Boulevard (Birmingham Road)	£5m	TP43
	16	Sutton Coldfield Relief Road	£6.7m	TP38/39 /43
	17	Highway Improvements – Holland Road / Lower Queens St. corridor	£4m	TP43
	18	Highway Improvements - Birmingham Road/Queen Street/Brassington Avenue		TP43
	19	Highway Improvements - Birmingham Road/Jockey Road		TP43
	20	Camp Hill Line Improvements including Camp Hill Chords	£210m	TP40
	21	Sutton Park Line local services		TP40
	22	Tamworth Line local services		TP40
	23	Moor St. Station Enhanced Passenger Capacity		TP38/40
	24	Sutton Public Transport Interchange	£5m	TP40
Langley SUE	25	Highway Improvements and Traffic Management	£34.6m**	TP43
	26	A38 Sutton Coldfield Bypass Maintenance	£3.4m	TP43
	27	Walking and Cycling Improvements	£12.08m **	TP38/39
	28	Public Transport provision	£20.8m**	TP40
Peddimore	29	Highway Improvements (including access off A38)		TP43
	30	Public Transport provision		TP40
Bordesley Park AAP	31	Highway and junction improvements	£20m	TP43
Eastern	32	Iron Lane junction improvements	£9.7m	TP43

Location	Ref. Number	Connectivity Infrastructure	Scheme Cost	Policy
Triangle	33	Meadway highway works and Lea Hall station improvements	£10m	TP43/40
Selly Oak and South Edgbaston	34	Selly Oak New Road (Phase 1B)	£6.2m	TP43
	35	University Station Improvements	£3.1m	TP40
Longbridge AAP	36	Longbridge Connectivity Package	£8.2m	TP38/39 /40
	37	Longbridge Highway Improvements	£6.0m	TP43
Outside the Growth Areas	38	Development of major road corridors	tbc	TP43
	39	Yardley Road / Stockfield Road Improvements	3.5m	TP38/43
	40	A38(M) Aston Expressway – Tame Valley Viaduct Phase 3 Maintenance Scheme	£82m	TP43
	41	Aston Road North / A38(M) Flyover Maintenance Scheme	£10.1m	TP43
	42	Highgate Road Improvements	£13.3m	TP38/39 /43
	43	Six Ways, Erdington Junction Improvements	£5.4m	TP43
	44	Journey Time Reliability Package to Growth Areas	£2.7m	TP39/40 /43
	45	Rail Stations and Services across Birmingham	£25m	TP40
	46	Water Orton Rail Corridor – Birmingham – Tamworth / Nuneaton	£103m	TP40
	47	New and Expanded Park and Ride Provision across the City	tbc	TP40
	48	Birmingham – Kings Heath – Maypole SPRINT	tbc	TP40
	49	Birmingham – Hagley Road SPRINT	£12.2m	TP40
	50	Birmingham – A34 Walsall Road SPRINT	£40m	TP40
	51	Birmingham – Bartley Green SPRINT	£30m	TP40
	52	Birmingham A45 Metro / SPRINT	£50m	TP40
	53	Eastside – East Birmingham – Birmingham Airport – HS2 Interchange Metro / SPRINT	£470m	TP40
	54	Birmingham – Sheldon – Birmingham Airport – HS2 Interchange Metro / SPRINT	tbc	TP40
	55	Smart Network, Smarter Choices Corridors – Phase 2	£25m	TP41/42 /43
	56	Birmingham Cycle Revolution	£24.3m	TP39
	57	Canalside Improvements (including canal features)	tbc	TP38/39
	58	Local Centres Programme including Environmental Improvements and Traffic Management	£12m	TP38/39 /40/43

* *Includes scheme development costs only*

** *includes infrastructure costs for both Peddimore and Langley urban extensions*

Figure 6.1 BDP Scheme Locations



6.3 Site Delivery Plan

The Site Delivery Plan (SPD) was produced in October 2013 to demonstrate that the overall levels of development set out in the BDP are achievable and that the overall spatial strategy can be realised. The SPD helps to demonstrate that the BDP is sound (as set out in the NPPF), particularly by demonstrating how the Growth Areas will develop over time and how infrastructure can help support development.

The SDP covers the following:

- Identifies the overall levels of growth that the BDP is aiming to deliver;
- Gives an overview of the considerations which have a key influence over the delivery of sites in Birmingham, including development viability and infrastructure
- An assessment of delivery for identified development sites
- Actions that will be undertaken (and underway) to enable site delivery.

A key part of the SDP is the assessment of delivery of large scale development sites. Principally, it is focussed on housing, employment, retail and office development based on the Strategic Housing Land Availability Assessment (2012) and the Infrastructure Delivery Plan (IDP). Overall, the assessment presents a clear understanding of delivery issues in the City and highlights what is needed to bring sites forward for development.

For full details, refer to the full Site Delivery Plan report, submitted in parallel with this Evidence Base.

Summary of Evidence

7 Summary of Evidence

The BDP contains 45 policies that relate to 'Growth Areas', 'Environment and sustainability', 'Economy and network of centres', 'Homes and neighbourhoods', and 'Connectivity'. The nine policies that fall under 'Connectivity' are supported by a full and robust Transport Evidence Base, as identified in previous chapters, with a further two policies making reference to the 'Connectivity' thematic policies. The following sections provide an overview of each policy in terms of associated evidence and how the documents meet the soundness criteria.

7.1 A Sustainable Transport Network

Policy Summary	Policy TP37	A Sustainable Transport Network		
The development of a sustainable, high quality, integrated transport system, where the most sustainable mode choices also offer the most convenient means of travel, will be supported. The delivery of this will require: • Improved choice by developing and improving public transport, cycling and walking networks, which will also aid carbon emission and air quality targets; • Improvements and development of road, rail and water freight routes will support the sustainable and efficient movement of goods and reduce the negative impact of road traffic; and • Ensuring that land use planning decisions support and promote sustainable travel.				
Evidence Base	**Positively Prepared**	**Justified**	**Effective**	**Consistent**
Birmingham Mobility Action Plan	✓	✓		✓
West Midlands Local Transport Plan 3	✓	✓	✓	✓
Towards a World Class Integrated Transport System	✓			✓
Delivering a Sustainable Transport System	✓			✓
Smarter Choices		✓	✓	✓

7.2 Walking

Policy Summary	Policy TP38	Walking		
The provision of safe and pleasant walking environments throughout Birmingham will be promoted. In particular this will include: • Improving pedestrian safety and priority at the top of the road user hierarchy, ensuring the public realm and connectivity to public transport links to and from centres, residential areas and new developments reflect this; • Ensuring good design of pedestrian routes/areas reflecting desire lines and providing adequate way finding facilities where appropriate whilst ensuring that routes/areas are free from unnecessary clutter; and • Providing pedestrian crossing facilities where appropriate and ensuring footway surfaces are well maintained.				
Evidence Base	**Positively Prepared**	**Justified**	**Effective**	**Consistent**
Rights of Way Improvement Plan		✓		✓
Delivering a Sustainable Transport System	✓			✓
Smarter Choices		✓	✓	✓
Birmingham City Centre Vision for Movement		✓		✓

7.3 Cycling

Policy Summary	Policy TP39	Cycling
Cycling will be encouraged through a comprehensive city-wide programme of cycling infrastructure improvements (both routes and trip end facilities) supported by a programme of cycling promotion, accessible cycling opportunities, training and travel behavioural change initiatives. This will include: • Development and enhancement of different route types to link residential areas, green spaces, local centres and transport interchanges in order to encourage a range of trip lengths; • Incorporating cycling into the 'Interconnect' on-street wayfinding totems currently being rolled out across the City Centre, and using improved direction signing alongside upgraded parking and trip end facilities; and • Provide support to take up cycling through access to bike hire, training and travel behaviour initiatives.		

Evidence Base	Positively Prepared	Justified	Effective	Consistent
Birmingham Cycle Revolution	✓		✓	✓
Smarter Choices		✓	✓	✓
Birmingham City Centre Vision for Movement		✓		✓

7.4 Public Transport

Policy Summary	Policy TP40	Public Transport
The bus is the most important mode of public transport in Birmingham, needs to be as attractive as the private car. The City Council will continue to work with Centro and bus operators to improve the bus network by: • Supporting partnership measures to develop and improve the bus network including the City Centre Statutory Quality Bus Partnerships and Bus Network Reviews. • Ensuring that road space is managed efficiently to support public transport through initiatives such as SMART routes and other bus priority measures and infrastructure. Proposals to enhance the City's rail network will be supported, including: • A growth in capacity through reopening of railway lines for passenger services, station and junction capacity enhancements, and expansion of park and ride sites. The development and extension of metro/bus rapid transit to facilitate improvement/enhancement in the public transport offer on key corridors and to facilitate access to development and employment will be supported through: • Midland Metro tram network extensions to Centenary Square and HS2/Eastside; and • Bus Rapid Transit and/or Metro routes on key arteries, including Birmingham Airport and HS2 Interchange.		

Evidence Base	Positively Prepared	Justified	Effective	Consistent
Birmingham Mobility Action Plan	✓	✓		✓
West Midlands Local Transport Plan 3	✓	✓	✓	✓
Towards a World Class Integrated Transport Network	✓			✓
Delivering a Sustainable Transport System	✓			✓
Smarter Choices		✓	✓	✓

7.5 Freight

Policy Summary	Policy TP41	Freight
A well-integrated freight distribution system which makes the most efficient and effective use of road, rail, air and water transport will be sought. Locations to support freight logistics will be required to demonstrate that: • Developments which generate large volumes of freight traffic or involve the transport of bulk materials should make use of rail (or water if appropriate) for freight movements wherever practical. They should include as part of the development, or be located close to, inter-modal freight facilities, rail freight facilities or wharves; • The retention of intermodal freight connections to existing industrial sites will be encouraged and the development of new inter-modal transfer facilities, new rail sidings and rail freight facilities and new wharves will be supported; and • Where road haulage is involved in the transport of large volumes of freight or the carrying of bulk materials, planning conditions and obligations will be used to define and agree suitable traffic routes and the need for other necessary environmental and traffic management controls.		

Evidence Base	Positively Prepared	Justified	Effective	Consistent
West Midlands Local Transport Plan 3	✓	✓	✓	✓
West Midlands Metropolitan Freight Strategy	✓		✓	✓

7.6 Low Emission Vehicles

Policy Summary	Policy TP42	Low Emission Vehicles
Proposals for Low Emission Vehicles (LEV) will be supported by: • Ensuring that public places and new developments include adequate provision for electric vehicle charging points in car parks, measures to encourage LEV use through Travel plans and other such initiatives; and • Work with partners to explore how the use of other alternative low emission vehicle technologies can be supported e.g. hydrogen fuel cells across a range of modes.		

Evidence Base	Positively Prepared	Justified	Effective	Consistent
West Midlands Local Transport Plan 3	✓	✓	✓	✓
Low Carbon Transport Strategy		✓		✓
Car Parking Guidelines		✓		✓

7.7 Traffic and Congestion Management

Policy Summary	Policy TP43	Traffic and Congestion Management

The optimum use of existing highway infrastructure across all modes will be encouraged and priority investment in the highway network to support the city's sustainable transport network and development agenda will be promoted. The efficient, effective and safe use of the existing transport network will be promoted through the following:

- Use of technology, such as Route Management Strategies incorporating the 'Smart Route' approach, Urban Traffic Management and Control (UTMC) and Intelligent Transport Systems on key routes which will aim to improve the routes for all users and improve network resilience;
- Targeted investments, including the provision of new connections, which reduce the negative impacts of road traffic, e.g. congestion, air pollution and road accidents and unlock development/redevelopment opportunities;
- Managing travel demand through a range of measures including 'Smarter Choices' and 'Cycle Revolution', the availability and pricing of parking and ensuring effective and proportionate parking enforcement;
- To improve road safety introduce 20mph speed limits across the majority of the network; and
- Maintenance of existing Highway Improvement Lines, where relevant to protect planned improvements in the Strategic Road Network.

Evidence Base	Positively Prepared	Justified	Effective	Consistent
West Midlands Local Transport Plan 3	✓	✓	✓	✓
Car Parking Guidelines		✓		✓
Smarter Choices		✓	✓	✓
Intelligent Transport Strategy				✓
Birmingham Cycle Revolution	✓		✓	✓

7.8 Accessibility Standards for New Development

Policy Summary	Policy TP44	Accessibility Standards for New Development

All major developments which are likely to generate either solely or in combination with other related developments more than 500 person-trips per day should aim to provide:

- An appropriate level of public transport provision (in terms of frequency, journey time and ease) to main public transport interchanges at the most relevant times of day;
- Associated public transport stop(s), with shelters and seating, within 80m of the main focal point(s) for the location - this condition may be relaxed if the location is within an established local shopping centre;
- Real Time Information (RTI) as appropriate (e.g. in a reception area, at the main outbound public transport shelters);
- Good pedestrian and cycle access with a commensurate number of seating facilities, convenient cycle stands, with cycle shelters where stays are likely to be of longer duration;
- Good accessibility to a range of local services such as GPs, Primary and Secondary Schools, local shops and open space.

Evidence Base	Positively Prepared	Justified	Effective	Consistent
Rights of Way Improvement Plan		✓		✓
Towards a World Class Integrated Transport Network	✓			✓

Evidence Base	Positively Prepared	Justified	Effective	Consistent
Smarter Choices		✓	✓	✓
Sustainable Communities Strategy	✓	✓		✓

7.9 Digital Communications

Policy Summary	Policy TP45	Digital Communications

Technology developments and access to digital services such as the internet are critical to Birmingham's economic, environmental and social development. Future schemes, proposals and developments should take into account:

- Inclusive high speed internet access for all;
- The provision of a Unified Street Services Network that provides a seamless connection for a range of digital technologies, linking together all the street activities such as street lighting and car parking; and
- The development and expansion of Intelligent Transport Systems that will enhance efficiency and user experience through The efficient use of its existing road space and tackle road traffic congestion, network resilience and alternative routes and quality public transport information and easy ticketing.

Evidence Base	Positively Prepared	Justified	Effective	Consistent
West Midlands Local Transport Plan 3	✓	✓	✓	✓
Towards a World Class Integrated Transport System	✓			✓
Intelligent Transport Strategy				✓
Birmingham's Smart City Vision	✓	✓		

7.10 Other Relevant Policies

Policy Summary	Policy TP26	Sustainable Neighbourhoods

Key point in relation to connectivity:

- Convenient options to travel by foot, bicycle and public transport with reduced dependency on cars and options for remote working supported by fast digital.
- Linked to Policies TP38-TP40, TP42, TP44, and TP45.

Policy Summary	Policy TP36	Health

Key point in relation to connectivity:

- Enhancing environments conducive to cycling and walking such as the canal network, and improving road safety.
- Linked to Policies TP38, TP39, TP42 and TP44.

Stakeholder Engagement

8 Stakeholder Engagement

8.1 Duty to Cooperate

Birmingham City Council has a duty, under Section 110 of the Localism Act 2011, to cooperate with neighbouring authorities. As summarised in the Duty to Cooperate Statement (October 2013) this exercise was initiated in 2012 with neighbouring councils, after the housing shortfall was identified.

The City Council's duty applies specifically when sustainable development is proposed that has a significant impact on at least two planning areas. The Birmingham Development Plan has identified areas for growth, and in particular in the Green Belt at Langley and Peddimore. Bilateral meetings have therefore been held with the following neighbouring highway authorities:

- Solihull Metropolitan Borough Council;
- Staffordshire County Council;
- Walsall Metropolitan Borough Council; and
- Warwickshire County Council.

Representations have also been made in respect the potential traffic impact by the Black Country Consortium.

Birmingham City Council has also engaged with the following prescribed bodies as part of the plan preparation:

- Centro;
- Highways Agency;

Birmingham City Council has also engaged with other bodies as part of the plan preparation:

- Canal and Rivers Trust;
- Network Rail;
- Sustrans (as advisor on the National Cycle Network); and,
- Various bus operators (those that operate public services in the vicinity of the Green Belt sites).

For full details of the consultation with stakeholders, refer to the Duty to Cooperate Statement.

8.2 Consultation Stages

The city council sought to engage neighbouring authorities and prescribed bodies at the Options Consultation stage in 2013. This followed the preparation of the transport analysis which went to inform the selection of the preferred development option.

Consultation continued with the stakeholders and regular meetings were held as the evidence base and infrastructure strategy was developed. The schedule of bilateral meetings held between October 2013 and May 2014 is contained in **Appendix D**.

Funding

9 Funding

The Infrastructure Delivery Plan sets out a number of funding sources for schemes specified within its schedule. The delivery of the infrastructure identified will require significant resources over the plan period. The two main sources of funding to deliver infrastructure to support growth will come from public and private sectors.

Public sector funding will come from the City Council, Government and other public agencies at the national and local level. Whilst this funding has been a significant resource in providing infrastructure in the past, it is currently constrained due to the prevailing economic conditions. However, the level of public funding will vary over the plan period to reflect local and national priorities, programmes and initiatives. The Government has already introduced a number of funding streams to incentivise development, and the City Council has funding programmes in place to deliver elements of infrastructure. From 2015, LEPs will be able to access £2 billion a year of central Government funding from the Single Local Growth Fund.

Private sector funding will predominantly come from the development industry as part of securing the delivery of development sites. Relating to transport, Section 106 contributions and Section 278 agreements will still be used to secure on site infrastructure. The City Council is looking to introduce a CIL to ensure that local and strategic infrastructure needs are funded by new development to help address the overall funding gap. It is recognised that the current economic climate has placed financial constraints on developers; however the City Council has worked successfully with developers to help bring developments forward with essential infrastructure.

The wider economic conditions are highly likely to change during the plan period and this will impact on the availability of funding. In improved market conditions, it is likely that additional infrastructure can be funded by the private sector, although public sector funding will still have an important role to play. Even in poor market conditions, developers and the City Council, working with its partners, have still been able to deliver infrastructure to support growth.

Further details of funding for infrastructure are contained in the IDP Schedule. Funding for the delivery of projects in the short term in the majority of cases is already in place, which demonstrates a strong commitment to new infrastructure. Longer term projects identified are key projects that are needed to help deliver the growth set out in the BDP. All projects will be regularly reviewed and may be subject to change depending on changing priorities and where infrastructure needs are greatest. Where a project is to be part or fully funded by the City Council, a Full Business Case will need to be prepared, where the importance and need for infrastructure will be justified to support the growth of the City.

Table 9.1 highlights potential funding opportunities to deliver the transport needs of the BDP. Further funding streams are identified in the Infrastructure Delivery Plan Schedule.

Table 9.1 Transport Scheme Funding Sources

Funding	Summary
Community Infrastructure Levy (CIL)	A charge on certain types of development to spend on a range of infrastructure to support the growth of an area. CIL is not yet in place in Birmingham, but is expected to be by April 2015.
Planning Obligations (Section 106 Agreements)	Funding / infrastructure provided as part of a development to make it acceptable in planning terms. Can only relate directly to the development. This mechanism is already extensively used in the City, particularly to help deliver affordable housing.
Section 278 Agreements	Funding by developers for necessary highway improvements as part of securing permission for development sites. Already used extensively in Birmingham as part of granting planning permissions.

Funding	Summary
Capital Investment Programmes	Investment in infrastructure by service providers to meet their own statutory obligations and responding to growth, including: • Utility providers in their equipment and sites; • The Council in its assets, including highways, leisure and open spaces; and • Network Rail and the Highways Agency in their networks.
Regional Growth Fund (LGF)	A Government fund totalling £3.2 billion, to support projects and programmes that are using private sector investment to create economic growth. Birmingham has already benefitted from RGF to help deliver a number of projects. Infrastructure investment includes £15.7m to upgrade the A45 to enable the runway extension at Birmingham Airport.
Growing Places Fund (GPF)	A Government fund totalling £500m to address infrastructure constraints, promote economic growth and delivery of jobs and houses. The fund is managed locally by the LEP. The fund is recyclable so that monies are repayable and can be used to support future projects. The GBSLEP has been allocated £15m, and part of this has already been allocated to help provide infrastructure to support regeneration schemes at Greater Icknield and Aston Regional Investment Site.
European Regional Development Fund (ERDF)	Birmingham has benefited from ERDF funding to provide infrastructure, including Eastside Park in the City Centre. It is also used to provide financial support to businesses to invest (including funding for businesses in Digbeth, Jewellery Quarter, Tyseley and East and North Birmingham), and this also helps provide infrastructure as part of these developments.
Enterprise Zone / Tax Increment Financing (TIF) / Business Rates Retention	The Government has proposed that it will allow Local Authorities borrowing powers, known as TIF, to borrow against predicted growth in their locally raised business rates. They can use the borrowing to fund key infrastructure and other capital projects, which will support locally driven economic development and growth. In announcing Enterprise Zones, Government is supporting LEPs by enabling them to retain the uplift in business rates when new development takes place in the Zone. In Birmingham, TIF was part of the City Deal package agreed with Government. The funding approach to support the City Centre Enterprise Zone has adopted a TIF like approach. The LEP has an Enterprise Zone Investment Plan to 2017/18 setting out how £128m will be invested in infrastructure and programmes to deliver development by borrowing against future business rates income. This long-term income (until 2038) can be used by the LEP to delivery projects to support its priorities.
Greater Birmingham & Solihull Local Transport Board (GBSLTB)	The GBSLTB was established to prioritise and oversee the delivery of Local Major Transport Schemes. There is a funding allocation of £23.9m from the Department for Transport for the 2015-19 delivery period. A provisional programme of schemes has been agreed with the GBSLTB which will be developed for final funding approval in advance of April 2015 when the funding becomes available. The schemes in Birmingham include One Station, Metro Extension (New Street Station to Centenary Square), Making the Connections for Growth (City Centre) and Hagley Road SPRINT.
Infrastructure Guarantees Scheme	The Government have made up to £40bn of financial guarantees for certain types of infrastructure project in the UK through this scheme. The Infrastructure (Financial Assistance) Act 2012 envisages that the Treasury may provide financial support for a wide range of infrastructure projects, including utilities and transport facilities, to initiate and fund construction of the project.
Highways Agency Route Strategies	The Highways Agency is developing strategies for the Strategic Road Network on a route basis. These route strategies will identify investment needs and are key to identifying the

Funding	Summary
	investment plans for the step change in funding on the strategic road network.
Network Rail Long Term Planning Process (LTPP)	The Long Term Planning Process (LTPP) is designed to facilitate the strategic planning of the rail network in a way which is flexible enough to take into account the views of the rail industry, funders, specifiers and customers on the requirements to develop the network to meet future demand through market studies, cross-boundary analysis and route studies. The funding period, known as Control Period 5, begins in April 2014 and will benefit the rail experiences for four million daily passengers, freight users and strengthen Britain's economic growth. Over the five years £38bn will be spent in maintaining, renewing and improving the railway. More and new trains will be added, new stations built, facilities improved, platforms lengthened and transformational projects will be completed such as the Thameslink programme, Birmingham New Street, the Northern Hub and main line electrification.
Capital Receipts	The money received from selling fixed assets (such as land, buildings, vehicles, plant & equipment).
Prudential Borrowing	Birmingham City Council will need to invest in its infrastructure so that people can continue to receive high-quality local services. Local authorities receive central government funding for a major part of their capital investment in the form of capital grants. They can also use income from their own capital assets to finance capital spending. The new Prudential system encourages local authorities to invest in the capital assets that they need to improve their services. It allows them to raise finance for capital expenditure without government consent as long as they can afford to service the debt out of their revenue resources.

Next Steps

10 Next Steps

The Birmingham Development Plan sets out, through a number of objectives and associated policies, infrastructure that will be required to mitigate growth in Birmingham to 2031, but also to maximise opportunity associated with the growth. In particular, connectivity is vital to unlocking growth potential within Birmingham and its surrounding areas. With a rise in population projected towards 2031, it is essential that the appropriate infrastructure is delivered to ensure efficient, healthy and sustainable connectivity can be made between residential and workplace locations.

Additional work is ongoing to enhance the already robust, sound and full set of evidence that will support the policies set out in the BDP, but also progress schemes towards delivery. The following provides an insight into ongoing work associated with the BDP:

- Traffic modelling of BDP impact on the Highways Agency Strategic Road Network (SRN). Following the initial investigation of impacts, option testing will be completed to ensure mitigation. Partners are working together to ensure a mechanism is in place to ensure funding for schemes during the BDP time period.
- Consultation with key stakeholders will continue as scheme designs are developed and delivered.
- Traffic modelling at specific locations where mitigation will be required. It is envisaged that the growth associated with the green belt development will have an impact on the local and regional transport network. Traffic modelling, scheme assessments and consultation will continue to ensure appropriate infrastructure and to retain existing levels of service along key routes throughout the area.
- In parallel with the submission of the BDP, several of the infrastructure schemes proposed have been included within the Greater Birmingham and Solihull Local Enterprise Partnership (GBS LEP) Strategic Economic Plan (SEP)[18]. Following the announcement of funding during summer 2014, successful schemes will be designed for delivery in 2015/16 onwards.
- Following consultation on the BMAP Green Paper[19], several clarifications have been requested. As a result, work is ongoing to ensure that the BMAP vision is deliverable over the next 20 years, with specific strategies developed to focus on specific modes, monitoring and funding. It is envisaged that following these clarifications, BMAP will provide a clear vision for mobility in Birmingham, with proposals progressing in harmony with those set out in the BDP.

This Evidence Base Report provides a summary of transport evidence associated with the infrastructure proposed within the BDP, and will provide technical support during the examination process.

[18] http://centreofenterprise.com/s/
[19] http://www.birmingham.gov.uk/bmap

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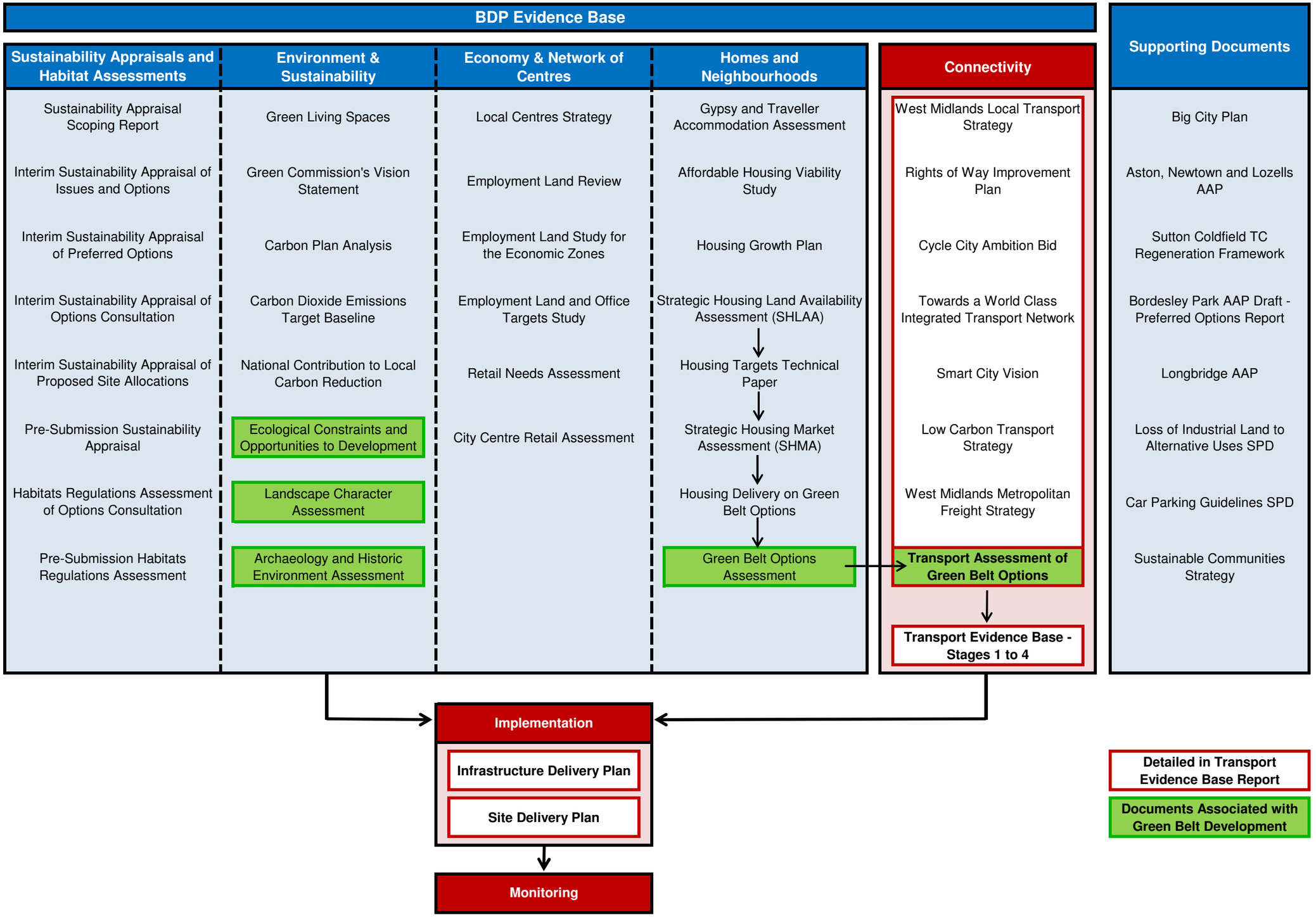
Appendix A – Evidence Base Summary Diagram

Appendix A - BDP Evidence Base Summary Diagram



Appendix B – Evidence Base Document Summary

Appendix B - BDP Evidence Base Document Summary

Sustainability Appraisals and Habitat Assessments		
Title	**Date**	**Summary**
Sustainability Appraisal Scoping Report	September 2008, revised November 2012	Outlines key sustainability issues for Birmingham, the 28 Sustainability Appraisal (SA) objectives, and monitoring indicators and targets that will be used for later stages of the SA process. Revision accounts for updated population growth figures, and the need for Green Belt development.
Interim Sustainability Appraisal of Issues and Options	February 2009	Presents findings from the consultation of Issues and Options report (September 2008), along with the final SA framework. Objectives grouped into 8 themes, and impacts and options summarised to generate the 'most sustainable option'.
Interim Sustainability Appraisal of Preferred Options	November 2010	An appraisal of the BDP policies and alternative options. The document concludes the significant effects of the BDP is broadly positive, and makes a series of detailed recommendations related to each of the key themes identified previously.
Interim Sustainability Appraisal of Options Consultation Document	October 2012	Reviews the Green Belt options (areas A-D) in light of revised growth forecasts. Concludes the Green Belt options offer a reasonable solution if the site reaches critical mass to be self-containing, and recommended mitigations are implemented.
Interim Sustainability Appraisal of Proposed Site Allocations	September 2013	A SA of the Growth Areas and Strategic Sites identified for development. All demonstrate a relatively strong sustainability performance. Recommendations are made to ensure sustainability objectives are worked towards.
Pre-Submission Sustainability Appraisal	October 2013	The complete SA, taking into account the previous documents listed above, to accompany the pre-submission version of the BDP. The document sets out the results of the SA and recommended mitigations to ensure sustainable development.
Habitats Regulations Assessment of Options Consultation	November 2012	The report reviews the BDP with regards to its impact on European sites of international nature conservation importance. Ten sites were deemed necessary for further assessment in terms of air quality, disturbance and recreational pressures, and water quality and supply.
Pre-Submission Habitats Regulations Assessment	October 2013	The issues and sites raised in November 2012 have been further appraised. It concludes the pre-submission version of the BDP is not likely to lead to adverse effects on any European Sites, with no requirement for further assessment.

Environment & Sustainability		
Title	**Date**	**Summary**
Green Living Spaces	September 2013	Sets out Birmingham's green vision, and its seven Green Living Spaces principles. These principles are embedded within the draft 'Your Green and Healthy City SPD'.

Environment & Sustainability		
Title	**Date**	**Summary**
Green Commission's Vision Statement	March 2013	A commitment to making Birmingham more prosperous, healthier, fairer, resource-efficient and better for business. The document pulls together wider work on carbon, ecosystems and the green economy.
Carbon Plan Analysis	March 2013	A review of carbon emissions from Birmingham, what the Carbon Plan means for the city and the pathways that might aid the aim of a 60% reduction in carbon by 2026.
Carbon Dioxide Emissions Target Baseline	March 2013	A technical report covering the methodology behind the carbon reduction targets set, and the 1990 estimated baseline. It recommends adjusting the targets to 57% by 2027, due to issues using a 1990 estimation, rather than a 2005 baseline.
National Contribution to Local Carbon Reduction	March 2013	A technical report detailing the impact that national policies such as the draft Energy Bill have on Birmingham's carbon reduction targets. It recommends the development of a 'City Energy Plan' and a 'Birmingham Carbon Roadmap' to aid the meeting of the targets set.
Ecological Constraints and Opportunities to Development	July 2013	An assessment of the ecological baseline of the Green Belt to the north and north east of Birmingham. Areas A-D are summarised in terms of constraints to development, and potential for enhancement. No significant difference between the four sites has been found.
Landscape Character Assessment	June 2013	An assessment of the four (A-D) potential Green Belt sites, through a review of 19 local landscape character areas. Figures detailing their sensitivity to residential development are shown, and typically show a lower impact in the southern areas (C and D).
Archaeology and Historic Environment Assessment.	September 2013	An assessment of Archaeology and Historic Environments that may be affected by the proposed Green Belt development. Areas are graded from red to green in terms of being excluded from development due to a lack of satisfactory mitigation, to recommend for development as there is good potential for mitigation.

Economy & Network of Centres		
Title	**Date**	**Summary**
Local Centres Strategy	July 2006	Reviews the local centres of Birmingham which have been identified as a priority for the council. The report reviews the centres, factors for success, centres in decline, and the future priorities and monitoring for the network.
Employment Land Review	2012	An analysis of the employment land and supply position in Birmingham. The current availability of high quality land is falling short of targets. Several key actions are recommended to maximise the city's employment land potential.

Economy & Network of Centres		
Title	**Date**	**Summary**
Employment Land Study for the Economic Zones and Key Sectors	October 2012	A review of employment land in terms of the identified economic zones and targeted key sectors by GBSLEP. A SWOT analysis of each sector concludes that overall, there will be a shortage of employment land to support the key sectors.
Employment Land and Office Targets Study	2013	The report analyses levels of demand for various property markets. It identifies a lack of 'Best Urban Sites' and 'Good Urban Sites' due to demand outstripping current supply.
Retail Needs Assessment	October 2009	An assessment of the need for additional retail development up to 2026 to inform the BDP. Identifies a hierarchy of local centres, and those with potential for improvement, and strategies for meeting retail needs.
City Centre Retail Assessment	April 2013	A review of Birmingham City Centre as a retail destination shows it performs strongly. It lists the amount of gross comparison goods floorspace (and preferred locations) the BDP should plan for. An emerging strategy for Birmingham is also detailed.

Homes and Neighbourhoods		
Title	**Date**	**Summary**
Gypsy and Traveller Accommodation Assessment	March 2008	This assessment reviews the current populations and site provisions of the local Gypsy and Traveller population, as well as levels of unauthorised encampments. Future needs to 2017 were reviewed and identified 19 new pitches in Birmingham.
Affordable Housing Viability Study	October 2010	A review into the desire for the council to request 40% affordable properties on housing sites. In the current market conditions, affordable housing is only viable within the most buoyant areas. Two alternative approaches are proposed that may allow more flexible contributions.
Housing Growth Plan	October 2013	Details the characteristics of Birmingham's housing market, future challenges, how to deliver the required levels of growth and an action plan that will allow effective monitoring.
Strategic Housing Land Availability Assessment (SHLAA)	2012	An assessment of the sites available within Birmingham for housing development. 1,199 sites have been identified with a capacity of 44,898 dwellings, including windfall and long term empty dwellings.
Housing Targets 2011-2031 Technical Paper	September 2013	Provides key data and rational used to justify housing policies, including an overall target, trajectory and mix of housing.
Strategic Housing Market Assessment (SHMA)	January 2013	This report identifies the housing need for 2012-2017, demand and planning targets for 2011-2016, and the overall housing mix and tenure required by 2031.

Homes and Neighbourhoods		
Title	**Date**	**Summary**
Housing Delivery on Green Belt Options	January 2013	A supplement to the SHMA that reviews the number of homes the market is willing and able to provide on Green Belt land. Reviews offsite highway infrastructure costs, and delivery rates over 5 and 20 years for a weak or strong housing recovery.
Green Belt Options Assessment	October 2013	A three stage process to analyse, score and rank the 18 areas of Green Belt within Birmingham against the purposes of the Green Belt. Only four areas were identified as most viable for development. A more detailed process was then undertaken to make a final recommendation for residential and employment development.

Connectivity		
Title	**Date**	**Summary**
West Midlands Local Transport Plan	2011	The Local Transport Plan (LTP) for 2011-2026 for the West Midlands. The LTP undertakes a SWOT analysis for the West Midlands, and outlines strategic principles, objectives, long term themes and policies. Links to the BDP are also highlighted.
Rights of Way Improvement Plan	November 2007	A by-ward analysis of the local right of way for recreation and access to the wider transport network. A ten year plan of improvements is set out.
Cycle City Ambition Bid	April 2013	A bid document summarising a 20 year plan to promote cycling within Birmingham. The bid focusses on eight main arterial routes into the city centre, and a network of quieter routes linking local centres and facilities. It was announced in August 2013 the bid was successful, and Birmingham would receive £17m.
Towards a World Class Integrated Transport Network	April 2013	A long term vision and strategy framework, focussing on public transport. The vision focusses on a mix of bus, Bus Rapid Transit, Metro Tram and heavy rail improvements to help the economy grow, help the environment, help public health, support housing development and to promote social inclusion.
Smart City Vision	November 2012	A document outlining the strategic vision and framework that will lay the foundation for building Birmingham's Smart City Roadmap. The aim is to work towards a more sustainable environment that will encourage economic growth and improve lives through technology
Low Carbon Transport Strategy	January 2012	This document outlines the strategy that will allow Birmingham to meet the carbon reduction targets outlined in the "Carbon Dioxide Emissions Target Baseline" report, above. Four key themes (Smarter Choices, Smarter Infrastructure, Smarter Technology and Effective Carbon Management Planning) will work together to meet a 60% reduction by 2026.

Connectivity		
Title	**Date**	**Summary**
West Midlands Metropolitan Freight Strategy	April 2013	The strategy outlines six functions; to steer investment programmes, inform and advise land use planning, decision making by regional bodies (LEPs and LTBs) and future major schemes, outline a regional strategy for strategic transport assets for national bodies (Highways Agency and Network Rail), and to influence government policy development . It also summarises key issues and proposals across the West Midlands area.
Transport Assessment of Green Belt Options	September 2013	A review of the four Green Belt development options in terms of off-site travel needs, connectivity and capacity. An infrastructure strategy of required improvements to all current modes of transport was undertaken, with several recommendations to ensure the transport-related impact of the Green Belt development is mitigated.
Transport Evidence Base – Scoping and Methodology Report	September 2012	An initial scope of the required Transport Evidence Base to support the BDP, reviewing the proposed methodology, input required, and the outputs expected to be generated.
Transport Evidence Base – Context Report	January 2014	A context report prior to assessment of the BDP using the Policy Responsive Integrated Strategy Model (PRISM). Key baseline transport challenges are identified, population and employment projections reviewed and required infrastructure to support the BDP are discussed.
Transport Evidence Base – Transport Modelling Assessment Initial Output Report	January 2014	Initial outputs from PRISM are reviewed. A base year (2011), reference case (no BDP) and development case (with BDP) for 2021 and 2031 is modelled, with significant impact on highway network junction capacity shown. Mitigation measures are being developed as part of the Birmingham Mobility Action Plan. There are only marginal increase in negative impacts between the reference case and development case.
Transport Evidence Base – Green Belt Development Movement Infrastructure Plan	January 2014	A report to identify and test a suitable package of multimodal measures to both support and mitigate the impacts of the development of the Green Belt proposals. Existing and future travel demand is reviewed, and three main routes from the Green Belt proposals are discussed in detail, in terms of potential interventions for a multi-modal infrastructure plan.

Supporting Documents		
Title	**Date**	**Summary**
Big City Plan	July 2011	This document details the City Centre Masterplan, outlining six broad objectives to enhance the city centre (made up of seven quarters), priorities and key projects to support ambitious growth targets. Includes projects related to enhancing public space and cycling routes for sustainable travel.

Supporting Documents		
Title	**Date**	**Summary**
Aston, Newtown and Lozells AAP	July 2012	This document sets out how parts of Aston, Newtown, Lozells and Perry Barr / Birchfield could grow and develop over the next 15 years. It identifies areas for housing regeneration, new retail and commercial growth, and the proposed Aston Advanced Manufacturing Hub.
Sutton Coldfield TC Regeneration Framework	November 2009	This framework will assist the Sutton Coldfield in fulfilling its potential as a strategic centre offering the quality of shopping, leisure and residential opportunities demanded by its residents.
Bordesley Park AAP Draft – Preferred Options Report	July 2013	The Bordesley Park Area Action Plan will guide the development and regeneration of the area to the east of the city centre, including Washwood Heath, Bordesley Green, Bordesley Village and Small Heath, over the next 18 years.
Longbridge AAP	April 2009	The Longbridge Area Action Plan sets out the land use framework and proposals for the regeneration of the former MG Rover plant site at Longbridge. The overall aim of the plan is to create a truly sustainable and well-designed community, and includes a movement strategy plan.
Loss of Industrial Land to Alternative Uses SPD	February 2006	This Supplementary Planning Document provides guidance to developers on the information required when submitting a planning application that involves a change of use from industrial land to an alternative use, such as housing or retail.
Car Parking Guidelines SPD	February 2012	A setting out of the car, cycle and motorcycle parking standards which will apply when planning applications for new development are considered. The process of seeking financial contributions from developers towards public transport improvements is also outlined.
Sustainable Communities Strategy	September 2008	This document brings together a variety of partners to create a vision to make Birmingham a great place to live, learn, work and visit a global city with a local heart. Five outcomes and four principles are set out to achieve this.
Birmingham Mobility Action Plan (BMAP)	November 2013	BMAP presents a twenty year vision for improving transport in the city. The document sets out how the transport system will meet current and future challenges, through influencing travel behaviour and embracing technological change to reduce carbon emissions and improve road safety and health.

Appendix C – PRISM Summary

Appendix C – PRISM Summary

*"**PRISM** (Policy Responsive Integrated Strategy Model) has been developed by Mott MacDonald and RAND Europe as a strategic model for the West Midlands, supported by the 7 district authorities, the Highways Agency and CENTRO. The model is a state of the art disaggregate demand model, with significant detail in zoning and networks.".*

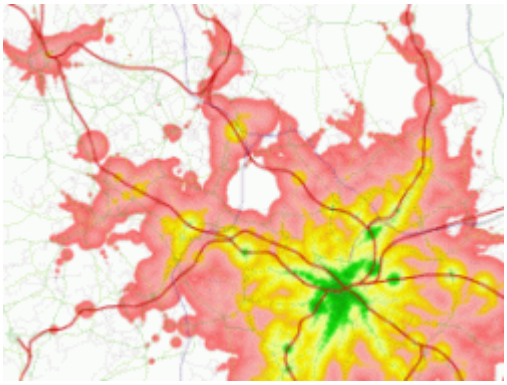
PRISM - an introductory guide

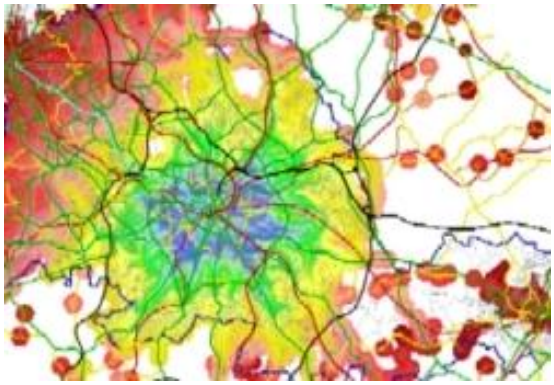
PRISM covers the West Midlands metropolitan area in about 1,000 zones, with a detailed network description of the highway and public transport networks. The model operates in the VISUM software, and represents in a detailed manner the following travel responses to congestion, investment and policy:

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

The model is a disaggregate travel demand model, based on principles applied previously in cities such as Paris, Copenhagen and Sydney. The key difference with traditional modelling techniques is that **PRISM** takes the individual traveller as the decision maker, rather than relying on zonal proxies. The main advantage of this approach is that the model is more reliable and robust.

Because of the detail in the representation of population, the model can forecast the impacts of socio-economic and demographic developments on travel patterns, and distinguish the impacts of policies on different social grouping.





Typical model outputs available to the end user are for base year 2006 and for reference years 2016 and 2026:

- matrices (994 zone level) of zone to zone trips (4 periods, 24 hour, for car driver, car passenger, public transport user (3 modes; rail, metro and bus), slow modes, HGV and LGV separately;
- these matrices can be subdivided further (if required) by purpose;
- matrices (994 zone level) of skimmed travel times, distances, generalised costs;
- network results for the whole PRISM network of link flows, congestion, travel times and speeds(in Mapinfo, CSV, or Access format);
- these matrices and network results can be cordoned to a smaller area as required;
- the matrices can be produced in TUBA format, if so required;
- mode split tables by mode and purpose;
- trip length distributions as required;
- desire lines and public/private isochrones to centres as specified;
- colour coded congestion indicators (actual/free flow time) for specified links;
- public/private mode share to specified centres; and
- population within pre-specified bandwidths.

In certain cases processed basic survey data can be made available, for example from roadside interviews. In model estimation and application extensive use is made of some 17,000 household surveys and roadside interviews at around 200 sites, in addition to public transport surveys, freight surveys and parking surveys, carried out between 2010 and 2012.

The ***new*** **PRISM** model has been designed to support the assessment of the following issues:

- LTP submissions and targets;
- Metro extensions;
- Park and Ride;
- ATM and widening;

An important role will be that of a database of travel movements, as input to more local models, including microsimulation. It is intended that any project in the West Midlands that requires modelling support will use **PRISM**, either as the database of network detail, planning data or travel demand patterns, or as a fully functional tool. The database may be more useful for smaller scale studies, for which cordoned networks and/or matrices can be generated for the years 2011, 2021 and 2031, whilst the full model specification becomes more relevant when forecasting the impacts of strategic schemes into the distant future. The model interfaces directly with PTV VISSIM microsimulation software. Access to **PRISM** is through the Joint Application Team, located in Mott MacDonald's central Birmingham Office.

Appendix D – Green Belt Consultation Summary

Appendix D

Warwickshire County Council				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
The need to understand the impact of growth and mitigation that can be brought at the following locations: - M42 Junction 9 (Dunton Island) - A4097 Minworth to M42 J9 - A446 M6 J4 to M42 J9 - Ox Leys Road - Church Lane - Dunton Lane - Wishaw Lane - Blindpit Lane - Water Orton Lane - Settlement of Curdworth - Settlement of Water Orton - Settlement of Wishaw	BCC concur that there is likely to be a traffic impact at these locations. BCC have committed to work closely with WCC to produce additional data to help understand the severity of impact, and identify possible remedial measures where necessary.	BCC commissioned Mott MacDonald to produce additional traffic data using the WM PRISM Model. This included Do Minimum Reference Case (i.e baseline) and the Do Something (with BDP) scenarios. BCC commissioned Phil Jones Associates to produce more detailed data of traffic increase on these particular roads. BCC, WCC and Highways Agency Commissioned JMP Consultants to prepare a detailed micro-simulation model of M42 J9.	BCC has provided an indication of traffic increase on these routes and junctions. JMP Consultants have developed the Local Model Validation Report which provides a baseline of existing conditions at M42 Junction 9, and forecast year scenarios have also been modelled. The current position is that works will be required on the junction in the next 15 years in any case, yet the BDP adds traffic which also requires mitigation. The overall works package required is yet to be determined. BCC consider that Blindpit Lane, Ox Leys Road, Church Lane, Dunton Lane and Wishaw Lane are unlikely to suffer any significant degree of congestion, although it is acknowledged that there are	BCC will continue to liaise with WCC and the developers to develop a scope of works that could be funded through the development. BCC, HA and WCC are working together to develop a strategy to overcome constraints at M42 Junction 9

			sensitivities on these routes including residential properties, private access and junctions with major roads. Remedial measures considered are traffic management schemes, such as speed limit changes or weight limits, and safety improvements at junctions with major roads. BCC acknowledge that the Settlements of Curdworth, Water Orton and Wishaw could experience an increase in traffic. However these lay on important connecting routes which are important for access to jobs and amenities. The impact on residents can be remediated, however, by discouraging rat-running using traffic management schemes, such as speed limit changes, weight limits, traffic calming and road safety improvements.	
Insufficient data in the evidence base of trip rates	The methodology of the Travel Demand Model is complex but based upon	BCC will prepare additional material to explain the methodology to WCC	Additional data has been shared with WCC	n/a

	empirical evidence and has been reconciled with the PRISM demand model			
Insufficient data in the evidence base for traffic distribution and increase in traffic on Warwickshire Roads	Additional data will be provided	BCC will prepare additional material to explain the methodology to WCC	Additional data has been shared with WCC	n/a

Staffordshire County Council				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
The need to understand the impact of growth on journey times at the following locations: - A38 junction with A5 - A4091 between Wishaw and Tamworth - A51 between Tamworth and Kingsbury - A453 between Tamworth and Bassetts Pole - A5127 between Lichfield and Sutton Coldfield - A5206 London Road and A51 Uppers St	BCC concur that there is likely to be a traffic impact at these locations. BCC have committed to work closely with SCC to produce additional data to help understand the severity of impact, and identify possible remedial measures where necessary.	BCC commissioned Mott MacDonald to produce additional traffic data using the WM PRISM Model. This included Do Minimum Reference Case (i.e baseline) and the Do Something (with BDP) scenarios. BCC commissioned Phil Jones Associates to produce more detailed data of traffic increase on these particular roads. BCC, WCC and Highways Agency Commissioned JMP Consultants to prepare a detailed micro-simulation	BCC has provided an indication of traffic increase on these routes and junctions. BCC consider these routes are unlikely to suffer any significant increase in congestion as a result of the proposals, although it is acknowledged that there are sensitivities at particular junctions. JMP Consultants have developed the Local Model Validation Report which provides a baseline of existing conditions at M42	BCC will continue to liaise with SCC and the developers to consider the assessment of specific junction and develop a scope of works that could be funded through the development. BCC, HA, SCC and WCC are working together to develop a strategy to overcome constraints at M42 Junction 9

John Street between Lichfield and Weeford Island.		model of M42 J9 and a more general view of the impact on the strategic network including the A38 and A5.	Junction 9, and forecast year scenarios have also been modelled. The current position is that works will be required on the junction in the next 15 years in any case, yet the BDP adds traffic which also requires mitigation. The overall works package required is yet to be determined.	
Insufficient data in the evidence base of travel times	BCC consider that the impact on travel times on these routes is an important consideration and ought to be assessed where the impact is found to be severe.	BCC commissioned Phil Jones Associates and Mott MacDonald to produce more detailed data of traffic increase on these particular roads.	Additional information has been provided to SCC	BCC will continue to liaise with SCC and the developers to consider the assessment of journey times on prescribed routes
Insufficient data in the evidence base for traffic distribution	Additional data will be provided	BCC will prepare additional material to explain the methodology to SCC	Additional information has been provided to SCC	n/a
Insufficient data in the evidence base on connectivity and modal shift benefits likely to accrue to Staffordshire as a result of the proposed PT improvements	There will be increased connectivity between the green belt sites and the Cross-City railway line. The BDP also brings further justification for increasing park and ride capacity and lengthening platforms. Modal shift within Staffordshire is likely to be negligible.	n/a	n/a	n/a

Highways Agency				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
The need to understand the impact of growth on queues and delays at the following locations: - M42 junction 9 - M6 junction 5	BCC concur that there is likely to be a traffic impact at these locations. BCC have committed to work closely with HA to produce additional data to help understand the severity of impact, and identify possible remedial measures where necessary.	BCC, WCC and Highways Agency Commissioned JMP Consultants to prepare a detailed micro-simulation model of M42 J9. BCC have also considered the traffic impact at M6 junction 5.	BCC has provided an indication of traffic increase on these routes and junctions. JMP Consultants have developed the Local Model Validation Report which provides a baseline of existing conditions at M42 Junction 9, and forecast year scenarios have also been modelled. The current position is that works will be required on the junction in the next 15 years in any case, yet the BDP adds traffic which also requires mitigation. The overall works package required is yet to be determined.	BCC and HA are working together to develop a strategy to overcome constraints at M42 Junction 9
The need to understand the impact of growth on junction capacity on: - M42 Junctions 3–6 - M6 Junctions 4–10 - M5 Junction 1-4	BCC consider that the impact on these junctions is beyond the scope of the development to influence.	BCC commissioned Mott MacDonald to produce more detailed data of traffic increase on these junctions.	This information has been send to HA for comment	n/a

Walsall Metropolitan Borough Council				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
The need to understand the impact of growth at the following locations: - A4148 northern ring road - A461 Lichfield Road - M6 Junction 10	BCC acknowledge that the BDP may have some impact on roads around the West Midlands outside the Birmingham boundary.	BCC commissioned Mott MacDonald to produce additional traffic data using the WM PRISM Model. This included Do Minimum Reference Case (i.e baseline) and the Do Something (with BDP) scenarios.	BCC has provided an indication of traffic increase on these routes and junctions. BCC consider these routes are unlikely to suffer any significant increase in congestion as a result of the proposals, although it is acknowledged that there are sensitivities at particular junctions.	BCC will continue to liaise with WMBC and where appropriate will support WMBC as it applies for funds.
Clarification required around the proposal to open the Sutton Park Line for passenger services	BCC support the opportunity to improve connectivity by rail to north and east Birmingham as outlined in the BDP, but consider that the Green Belt site is not dependent upon it. BCC accept that there is a requirement to provide adequate public transport connectivity, by rail, bus or rapid transit and have developed a comprehensive package to this end. The opportunities to improve	BCC commissioned CH2M Hill to consider the feasibility of bringing the Sutton Park line into use for passenger services. This report has been published as part of the evidence base.	BCC support the opportunity to improve connectivity by rail to north and east Birmingham, and support the electrification of the Aldridge Line.	BCC will continue to work closely with partners Centro, Network Rail and London Midland, to develop capacity on the Cross-City Line; consider the opening of a station at Castle Vale; and in the context of other schemes continue to support the provision of the Bordesley Curves, works at Water Orton and opening of the Sutton Park Line for passengers.

	connectivity by rail include a range of options such as new stations and enhanced capacity to the cross city line and Tamworth line, but the constraints are significant and the solutions relate to schemes elsewhere in the region. It is therefore our view that any proposals for improvements to the rail network in north east Birmingham should form a part of a comprehensive package, which would be related to but nevertheless lay outside the scope of the BDP.			

Solihull Metropolitan Borough Council				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
n/a				BCC will continue to liaise with SMBC on the development of the evidence base

The Black County Consortium				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
Generally in support of the opening of the Sutton Park Line, particularly in the light of possible electrification of the Walsall line to Aldridge. The consortium have aspirations to connect into the HS2 hub, and view the Sutton Park Line as providing a part of this.	BCC support the opening of the Sutton Park Line to passengers, but it is not a precursor to proposed developments contained in the plan.	BCC commissioned CH2M Hill to consider the feasibility of bringing the Sutton Park line into use for passenger services. This report has been published as part of the evidence base.	BCC support the opening of the Sutton Park Line to passengers	BCC will continue to work closely with partners Centro, Network Rail and London Midland, to develop capacity on the Cross-City Line; consider the opening of a station at Castle Vale; and in the context of other schemes continue to support the provision of the Bordesley Curves, works at Water Orton and opening of the Sutton Park Line for passengers.
The is an increase in traffic at the following sensitive junctions: - M5 Junction 1 - M5 Junction 2 and - M6 Junction 10 There are proposals within the Black Country LEP Strategic Economic Plan to fund improvements at all three junctions. The Black Country would like a letter of support from Birmingham City Council to accompany	Noted.	n/a	n/a	BCC to continue to work with the Black Country authorities to bring forward schemes of mutual benefit, to that end a letter of support will be provided.

the SEP.				

Centro				
Issues Arising	BCC Initial Response	Actions Taken	Current Position/Outcomes	Next Steps
The Green Belt developments are currently poorly served. The plan should include a range of sustainable transport provision and infrastructure	The plan contained in the evidence base and the IDP demonstrates that the Green Belt sites will be well served by sustainable transport	n/a	The plan includes a range of sustainable transport provision and infrastructure. Centro accept this position.	BCC continue to work with Centro and Operators to develop a sustainable PT network to support development in the Green Belt
The significance of HS2 is understated.	HS2 is not a committed scheme, which is why it cannot form a part of the BDP. However BCC fully support HS2 and the economic developments that it will bring.	n/a	BCC fully support HS2 and the economic developments that it will bring. Centro accept this position.	n/a
All public transport schemes mentioned in the AAP's should be embedded in the Development Plan and on the Development Plan Policies Map	Significant transport schemes are mentioned in the BDP policies section, and in the IDP, which has sufficient weight to ensure the schemes are delivered. Given the uncertainty of the detail of these schemes, they cannot be shown on the Policies Map.	BCC to amend the policies to ensure that significant schemes are outlined in the policy. The IDP will be reviewed so that it conforms with the latest transport strategies.	Centro accept this position.	n/a
All SPRINT/Rapid Transit Routes and other significant public transport schemes should be referenced and shown on special plan maps.	Significant transport schemes are mentioned in the BDP policies section, and in the IDP, which has sufficient weight to ensure the schemes are delivered.	BCC to amend the policies to ensure that significant schemes are outlined in the policy. The IDP will be reviewed so that it conforms with the latest transport strategies.	Centro accept this position.	

	Given the uncertainty of the detail of these schemes, they cannot be shown on the Policies Map.			
Centro welcomes the importance placed on connectivity but believes further dialogue is required to ensure synergy with the LTP, BMAP and the Integrated Public Transport Prospectus	Noted.	n/a	n/a	n/a
Centro prefer that their defined standards for passenger accessibility to public transport are used for consistency.	Noted and taken into consideration	n/a	TBC	TBC

Schedule of Consultation

Consultation	**Dates**	**Subject (Transport)**
Warwickshire County Council	4.10.13	Greenbelt Option Analysis
	21.1.14	General Briefing
	1.4.14	Telecon Briefing
	20.05.14	Briefing re. M42 J9 network performance
Solihull	24.10.13	Greenbelt Option Analysis

Centro	3.10.13	Greenbelt Option Analysis
(with London Midlands and Network Rail)	22.11.13	Sutton Line
	26.11.13	Bus
Staffordshire	4.10.13	Greenbelt Option Analysis
	21.1.14	General Briefing
	20.05.14	Briefing re. M42 J9 network performance
Walsall	1.10.13	Greenbelt Option Analysis
Highways Agency		
	31.10.13	Scope of PRISM Modelling
	17.12.13	PRISM Modelling update
	24.12.13	PRISM Modelling update
	21.1.14	General Briefing
	31.1.14	Meeting to discuss a model of M42 J9
	11.3.14	Evidence base update
	18.3.14	Evidence base update
	25.3.14	Evidence base update
	15.4.14	Evidence base update
Sustrans	14.2.14	Presentation of Cycle Strategy

Appendix E – Green Belt Infrastructure Summary

Public Transport Strategies 1-3 Required Interventions				
Ref	**Location / Description**	**Need**		**Cost**
1.1	Penns Lane bus activation at signal junctions	Desirable	£	80,439
1.2	Fox Hollies Road bus activation at signal junctions	Desirable	£	98,315
1.3	Reddicap Heath Road bus activation at signal junctions	Desirable	£	49,157
1.4	Riland Road / Coleshill Road bus activation at signal junctions	Desirable	£	13,407
1.5	Victoria Road / Coleshill Road bus activation at signal junctions	Desirable	£	17,875
1.6	Rectory Road / Hollyfield Road bus activation at signal junctions	Desirable	£	17,875
2.1	Eachelhurst Road Railway Bridge widening	Essential	£	2,549,076
2.2	Bus Gate from Kingsbury Road to Park Lane, Castle Vale	Essential	£	340,723
2.3	Jarvis Way bus activation at A38 signal junctions	Essential	£	17,875
2.4	Wheelwright Road bus activation at A38 signal junctions	Essential	£	17,875
2.5	Bromford Lane bus activation at A38 signal junctions	Essential	£	26,813
2.6	Wood Lane bus activation at A38 signal junctions	Essential	£	17,875
2.7	Holly Lane bus activation at A38 signal junctions	Essential	£	22,344
2.8	Bagot Arms Junction bus priority	Essential	£	745,964
1.7, 2.10, 3.1	SPRINT Route	Essential	£	11,683,000
1.8, 2.11, 3.2	CityLink route	Essential	£	2,567,000
-	Bus kickstart fund	Essential	£	3,000,000

SPRINT

Cycling and Walking Strategies 1-3 Required Interventions				
Ref	**Location / Description**	**Need**		**Cost**
1.1, 2.1, 3.1	Station Street - Traffic Mitigation Measures (High)	Desirable	£	55,709
1.1, 2.1, 3.1	Sutton Coldfield Relief Road - Traffic Mitigation Measures (Medium)	Desirable	£	132,161
1.1, 2.1, 3.1	Ebrook Road - Traffic Mitigation Measures (High)	Essential	£	40,185
1.1, 2.1, 3.1	Wylde Green Road - Traffic Mitigation Measures (Low)	Essential	£	360,469
1.1, 2.1, 3.1	Calder Drive - Traffic Mitigation Measures (High)	Essential	£	80,369
1.1, 2.1, 3.1	Sutton Coldfield station/college - Traffic Mitigation Measures (Medium)	Desirable	£	-
1.1, 2.1, 3.1	Sutton Coldfield High Street - Traffic Mitigation Measures (Medium)	Desirable	£	150,819
1.1, 2.1, 3.1	Lichfield Road - Traffic Mitigation Measures (Medium)	Desirable	£	117,390
1.1, 2.1, 3.1	Good Hope Hospital - Traffic Mitigation Measures (Low)	Desirable	£	68,314
1.1, 2.1, 3.1	Whitehouse Common Road - Traffic Mitigation Measures (Medium)	Desirable	£	235,952
1.1, 2.1, 3.1	Langley Park Road - Traffic Mitigation Measures (High)	Desirable	£	36,166
1.1, 2.1, 3.1	Blakemore Road - Traffic Mitigation Measures (High)	Desirable	£	26,790
1.1, 2.1, 3.1	Fairfax Road - Traffic Mitigation Measures (High)	Desirable	£	20,525
1.1, 2.1, 3.1	Retford Drive - Traffic Mitigation Measures (High)	Desirable	£	16,744
1.1, 2.1, 3.1	Reddicap Heath Road - Traffic Mitigation Measures (Low)	Essential	£	85,727

1.1, 2.1, 3.1	Reddicap Hill - Traffic Mitigation Measures (High)	Essential	£	7,367
1.1, 2.1, 3.1	Broome Close - Traffic Mitigation Measures (Highest)	Desirable	£	19,088
1.1, 2.1, 3.1	Coleshill Road - Traffic Mitigation Measures (Medium)	Essential	£	130,516
1.1, 2.1, 3.1	Froggatts Ride / Berryfields Road - Traffic Mitigation Measures (High)	Essential	£	51,570
1.1, 2.1, 3.1	Manor Road - Traffic Mitigation Measures (High)	Desirable	£	45,275
1.1, 2.1, 3.1	Queen Street / Lower Queen Street - Traffic Mitigation Measures (Highest)	Desirable	£	136,048
1.1, 2.1, 3.1	South Parade / The Parade - Traffic Mitigation Measures (Low)	Desirable	£	33,487
1.1, 2.1, 3.1	Walmley Road - Traffic Mitigation Measures (Low)	Essential	£	117,473
1.1, 2.1, 3.1	Fox Hollies Road - Traffic Mitigation Measures (Medium)	Desirable	£	58,536
1.1, 2.1, 3.1	Wylde Green Road - Traffic Mitigation Measures (High)	Essential	£	60,813
1.1, 2.1, 3.1	Walmley Ash Lane - Traffic Mitigation Measures (Highest)	Essential	£	365,387
1.1, 2.1, 3.1	Walmley Ash Road - Traffic Mitigation Measures (Medium)	Essential	£	123,233
1.1, 2.1, 3.1	Holifast Road - Traffic Mitigation Measures (Medium)	Desirable	£	54,249
1.1, 2.1, 3.1	A5127 Sutton Road / Birmingham Road - Traffic Mitigation Measures (Low)	Desirable	£	136,048
1.1, 2.1, 3.1	Florence Road / Broadfields Road - Traffic Mitigation Measures (High)	Desirable	£	36,836
1.1, 2.1, 3.1	Chester Road - Traffic Mitigation Measures (Low)	Desirable	£	419,929
1.1, 2.1, 3.1	Grange Road/Arthur Road - Traffic Mitigation Measures (High)	Desirable	£	-
1.1, 2.1, 3.1	Holly Lane - Traffic Mitigation Measures (High)	Essential	£	322,629
1.1, 2.1, 3.1	Holliday Road/Mason Road - Traffic Mitigation Measures (High)	Desirable	£	-
1.1, 2.1, 3.1	Wilton Road / Osborne Road - Traffic Mitigation Measures (Highest)	Desirable	£	-
1.1, 2.1, 3.1	Terry Drive / Cater Drive - Traffic Mitigation Measures (Highest)	Desirable	£	54,919
1.1, 2.1, 3.1	Blackwell Road / Kempson Avenue - Traffic Mitigation Measures (Highest)	Essential	£	64,965
1.1, 2.1, 3.1	Brooks Road / Greenhill Road - Traffic Mitigation Measures (Highest)	Essential	£	47,217
1.1, 2.1, 3.1	Green Lanes - Traffic Mitigation Measures (Medium)	Desirable	£	75,681
1.1, 2.1, 3.1	Water Orton Lane - Traffic Mitigation Measures (Medium)	Essential	£	481,830
1.1, 2.1, 3.1	B4117 / Marsh Lane / Maud Road - Traffic Mitigation Measures (Medium and High)	Essential		see TM3.7
1.1, 2.1, 3.1	Paget Road - Traffic Mitigation Measures (High)	Desirable	£	69,252
1.1, 2.1, 3.1	Ashold Farm Road - Traffic Mitigation Measures (Highest)	Desirable	£	816,290
1.1, 2.1, 3.1	Forge Lane - Traffic Mitigation Measures (Highest)	Essential	£	186,581
1.1, 2.1, 3.1	Springfield Road - Traffic Mitigation Measures (High)	Essential	£	134,356
1.1, 2.1, 3.1	Walmley Road - Traffic Mitigation Measures (High)	Essential	£	412,900
1.1, 2.1, 3.1	Eachelhurst Road - Traffic Mitigation Measures (High)	Desirable	£	133,949
1.1, 2.1, 3.1	Humberstone Road - Traffic Mitigation Measures (Highest)	Essential	£	27,928
1.2, 2.2, 3.2	Wide Path from Elm Road to Wylde Green Road - Off Road Route (High)	Essential	£	262,256
1.2, 2.2, 3.2	Wylde Ggreen Road to Penns Lane - Off Road Route (High)	Essential	£	590,528
1.2, 2.2, 3.2	Penns Lane to Eachelhurst Road- Off Road Route (High)	Desirable	£	573,782
1.2, 2.2, 3.2	Penns Lane - Off Road Route (Medium)	Desirable	£	281,075
1.2, 2.2, 3.2	Wylde Green Road between stations - Off Road Route (Medium)	Desirable	£	736,509
1.2, 2.2, 3.2	Walmley to the Village Way - Off Road Route (Medium)	Essential	£	92,446

1.2, 2.2, 3.2	Langley from Calder Drive - Off Road Route (Medium)	Desirable	£ 93,625
1.2, 2.2, 3.2	Sutton Coldfield BVGS playing fields - Off Road Route (Medium)	Desirable	£ 178,627

	Cycling and Walking Strategies 1-3 Required Interventions		
Ref	**Location / Description**	**Need**	**Cost**
1.2, 2.2, 3.2	Falcon Lodge / St Chads Road / Churchill Road - Off Road Route (Low)	Essential	£ 177,531
1.2, 2.2, 3.2	Withy Hill Road / Langley Park Way - Off Road Route (Medium)	Desirable	£ 114,269
1.2, 2.2, 3.2	Rectory Road / Churchill Road - Off Road Route (Low)	Essential	£ 65,329
1.2, 2.2, 3.2	Dovebridge Road / Laburnum Drive - Off Road Route (High)	Desirable	£ 96,952
1.2, 2.2, 3.2	Rectory Park - Off Road Route (High)	Essential	£ 185,091
1.2, 2.2, 3.2	Coleshill Road to Fledburgh Drive - Off Road Route (High)	Desirable	£ 179,803
1.2, 2.2, 3.2	East View Road to The Avenue - Off Road Route (Medium)	Essential	£ 152,706
1.2, 2.2, 3.2	Chester Road rail station to The Yenton - Off Road Route (Medium)	Desirable	£ 56,183
1.2, 2.2, 3.2	Pype Hayes Park, Woodlands / Paget Road - Off Road Route (High)	Desirable	£ 282,043
1.2, 2.2, 3.2	Emason Road to Wilton Road - Off Road Route (Low)	Desirable	£ 25,152
1.2, 2.2, 3.2	Osborne Road to Erdington station - Off Road Route (Medium)	Desirable	£ 27,753
1.2, 2.2, 3.2	Parkfield Road to WM county border - Off Road Route (High)	Desirable	£ 717,007
1.2, 2.2, 3.2	A38 bypass north of Walmley Ash Lane - Off Road Route (Special)	Desirable	£ 380,700
1.2, 2.2, 3.2	Hurst Green Road to Wiggings Hill Road - Off Road Route (Medium)	Essential	£ 141,194
1.2, 2.2, 3.2	Peddimore Internal Routes - Off Road Route (Medium)	Essential	£ 469,553
1.2, 2.2, 3.2	Lichfield Road to Edison Road - Off Road Route (High)	Desirable	£ 312,993
1.2, 2.2, 3.2	B4117 East of Maud Road - Off Road Route (High)	Desirable	£ 99,156
1.2, 2.2, 3.2	Springfield Road on development side - Off Road Route (Medium)	Essential	£ 121,493
1.2, 2.2, 3.2	Pype Hayes Park, Chester Road to Newhall Valley - Off Road Route (High)	Desirable	£ 374,589
1.2, 2.2, 3.2	Westmead Crescent (Paget Road gap, east of school) - Off Road Route (Medium)	Desirable	£ 60,044
1.2, 2.2, 3.2	Burcote Road and Ashold Farm Road - Off Road Route (Medium)	Desirable	£ 233,135
1.2, 2.2, 3.2	Wood Lane to A47 - Off Road Route (Medium)	Desirable	£ 159,254
1.2, 2.2, 3.2	North-South spine through Langley - Off Road Route (Medium)	Essential	£ 1,387,316
1.2, 2.2, 3.2	Forge Croft / Forge Lane / Manby Road - Off Road Route (Special)	Essential	£ 578,100
1.2, 2.2, 3.2	Forge croft / Forge Lane - Off Road Route (Low)	Essential	£ 16,986
1.2, 2.2, 3.2	Park Lane / Farnborough Road - Off Road Route (Medium)	Essential	£ 318,508
1.2, 2.2, 3.2	Spitfire Island to A452 - Off Road Route (Medium)	Desirable	£ 223,284
1.2, 2.2, 3.2	Pype Hayes Park eastern side - Eachelhurst Road - Off Road Route (Medium)	Desirable	£ 128,717
1.2, 2.2, 3.2	Chester Road - south east of Humberstone Road - Off Road Route (Low)	Desirable	£ 44,750
1.3	Barnard Road / Whitehouse Common Road - Two Toucan Crossings	Desirable	£ 144,000
1.4	Coleshill Road / Lisures Drive - Toucan Crossing	Desirable	£ 72,000
1.5	Thimble End Road / Ssignal Hayes Road - Toucan Crossing	Essential	£ 96,000
2.3	Station Road Erdington - Toucan Crossing	Desirable	£ 36,000
2.4	Tyburn Road at Paget Road and Burcote Road - Toucan Crossings	Desirable	£ 144,000

2.5	A38 Kingsbury Road at Burcote Road and Ashold Farm Road - Toucan Crossings	Desirable	£ 144,000
2.6	Walmley Ash Lane - Toucan Crossing	Essential	£ 72,000
2.7	Walmley Ash Road - Toucan Crossing	Essential	£ 36,000
2.8	Wingfoot Way - Two Toucan Crossings	Desirable	£ 192,000
2.9 to 2.18	Canal Towpath Improvements	Essential	£ 964,000
3.3	B4118 Water Orton Road - Toucan Crossing	Essential	£ 96,000
3.4	A446 Lichfield Road - Two Toucan Crossings	Desirable	£ 144,000
3.5 to 3.7	Birmingham Fazeley Canal - Towpath surface improvements, localised widening, lighting and wayfinding	Essential	see 2.9

	Highway Strategies 1-3 Required Interventions		
Ref	**Location / Description**	**Need**	**Cost**
1.1	Peddimore Roundabout - New A38 junction	Essential	£ 12,707,517
1.2	Lindridge Road / Whitehouse Common Road - Junction improvements	Essential	£ 22,909
1.3	Tamworth Road / Whitehouse Common Road - Junction improvements	Essential	£ 106,972
1.4	Rectory Road / Whitehouse Common Road - Junction improvements	Essential	£ 226,972
1.5	Hollyfield Road / Reddicap Heath Road - Junction improvements	Essential	£ 226,972
1.6	Walmley Road / Hollyfield Road - Junction improvements	Essential	£ 22,909
2.1	Minworth Island Roundabout - Junction improvements	Essential	£ 3,123,057
2.2	M6 Junction 5 - Junction improvements	Desirable	£ -
2.4	Kingsbury Road / Cottage Lane - Junction improvements	Essential	£ 229,598
2.5	Tyburn Island - Junction improvements	Essential	£ 1,792,938
2.6	Spitfire Island - Junction improvements	Essential	£ 229,598
2.7	Walmley Ash / Webster Way - Junction improvements	Essential	£ 172,198
2.8	Walmley Ash / Eachelhurst Road - Junction improvements	Essential	£ 237,598
3.1	Minworth Island Roundabout - Junction improvements	Essential	see 2.1
3.2	M42 Junction 9 - Junction improvements	Essential	£ 3,500,000
3.3	Minworth Link Road (Water Orton Bypass)	Desirable	see 2.3
3.4	Kingsbury Road / Cottage Lane - Junction improvements	Essential	see 2.4

	Traffic Management Strategies 1-3 Required Interventions		
Ref	**Location / Description**	**Need**	**Cost**
1.1	Lower Queen Street / South Parade - Junction improvements (Low)	Desirable	£ 22,909
1.2	Webster Way / Calder Drive - Junction improvements (Medium)	Essential	£ 80,229
1.3	Rectory Road / Rectory Park - Junction improvements (Low)	Essential	£ 22,909
1.4	Hollyfield Road / St Chads Road - Junction improvements (Entry Treatment)	Essential	£ 12,000
1.5	Springfield Road / Churchill Road - Junction improvements (Medium)	Essential	£ 80,229
1.6	Whitehouse Common Road / Withy Hill Road - Junction improvements (Medium+Entry Treatment)	Essential	£ 92,229
1.7	Rectory Road / Blakemore Road - Junction improvements (Medium+Raised Table)	Essential	£ 110,229
1.8	Reddicap Heath Road / Fairfax Road - Junction improvements (Medium+Raised Table)	Desirable	£ 110,229
1.9	Reddicap Heath Road /Walsh Drive - Junction improvements (Medium+Raised Table+Bumps)	Desirable	£ 115,329
1.10	Springfield Road / Laburnum Drive - Junction improvements (Medium)	Essential	£ 80,229
1.11	Springfield Road / Reddicap Heath Road - Junction improvements (High)	Essential	£ 229,598
1.12	Walmley Road / Sir Alfreds Way / Berryfields Road - Junction improvements (Low)	Essential	£ 22,909
1.13	Berryfields Road / Froggatts Ride - Junction improvements (Medium+Raised Table)	Essential	£ 110,229
1.14	Springfield Road / Froggatts Ride - Junction improvements (Medium)	Essential	£ 80,229
1.15	Clifton Road / Manor Road - Junction improvements (Medium+Raised Table)	Desirable	£ 110,229
1.16	Walmley Road / Signal Hayes Road / Springfield Road - Junction improvements (High)	Essential	£ 286,997
1.17	Walmley Road / Fox Hollies Road / Wylde Green Road - Junction improvements (Low)	Essential	£ 22,909
1.18	Wylde Green Road / East View Road - Junction improvements (Medium+Raised Table)	Essential	£ 110,229
1.19	A5127 Birmingham Road / Wylde Green Road - Junction improvements (Low+Entry Treatment+crossings)	Desirable	£ 115,909
1.20	Walmley Ash Road / Webster Way - Junction improvements (High)	Essential	£ 172,198
1.21	Walmley Road / Cater drive / Warren House Farm - Junction improvements (Medium+Raised Table)	Essential	£ 110,229
1.22	Wylde Green Road / Blackwell Road / Maney Hill Road - Junction improvements (Medium+Raised Table)	Essential	£ 136,972
1.23	Thimble End Road / Springfield Road - Junction improvements (High)	Essential	£ 229,598
1.24	Thimble End Road / Walmley Road - Junction improvements (Medium+crossings)	Essential	£ 214,972
1.25	Elm Road / Newhall Valley Path - Junction improvements (Raised Table)	Essential	£ 30,000
1.26	Lindridge Road - Traffic Management	Desirable	£ 147,344
1.27	Falcon Lodge - General Traffic Management	Essential	£ 226,376
1.28	Reddicap Heath - General Traffic Management	Essential	£ 232,568
1.29	Walmley - General Traffic Management	Essential	£ 277,144
1.30	Castle Vale - General Traffic Management	Desirable	£ 192,154
1.31	Coleshill Road, Rectory Road, Riland Road - Traffic Management	Essential	£ 44,092
2.1	Penns Lane / Berwood Road - Junction improvements (Medium)	Desirable	£ 80,229
2.2	Chester Road / Paget Road - Junction improvements (High+Raised Table)	Desirable	£ 202,198
2.3	Chester Road / Grange Road - Junction improvements (High)	Desirable	£ 172,198
2.4	Edwards Road / Holliday Road / Mason Road - Junction improvements (Medium+Raised Table)	Desirable	£ 110,229
2.5	A5127 / Wilton Road - Junction improvements (Low+2 Entry Treatments)	Desirable	£ 46,909

2.6	A5127 / Greenhill Road / Cambridge Avenue - Junction improvements (Low+Entry Treatment+Crossing)	Desirable	£	67,545
2.7	A5127 Little Green Lane - Junction improvements (Low+Entry Treatment)	Desirable	£	34,909
2.8	Green Lanes / Little Green Lanes - Junction improvements (Low+Raised Table)	Desirable	£	52,909
2.9	Kingsbury Road / Forge Lane - Junction improvements (Medium+Crossings)	Essential	£	152,229
2.10	Eachelhurst Road / Humberston Road - Junction improvements (Low+Entry Treatment)	Desirable	£	34,909
2.11	Chester Road / Humberstone Road - Junction improvements (Medium+Entry Treatment)	Desirable	£	92,229
2.12	Eachelhurst Road / Elmfield Avenue - Junction improvements (Low+Entry Treatment)	Desirable	£	34,909
2.13	The Yenton - Junction improvements	Desirable	£	120,000
2.14	Kingsbury Road / Coleshill Road - Junction improvements	Essential		see 3.2
2.15	Penns Lane / Lichfield Road - Junction improvements	Desirable	£	150,000
3.1	Minworth Parkway / Midpoint Way / Water Orton Lane - Junction improvements	Essential	£	142,972
3.2	Kingsbury Road / Coleshill Road - Junction improvements	Essential	£	90,545
3.3	B4118 Marsh Lane / Manor House Lane - Junction improvements	Desirable	£	52,909
3.4	B4117 / Coleshill Road / Station Drive - Junction improvements	Desirable	£	136,972
3.5	A446 Lichfield Road / B4117 Watton Lane - Junction improvements	Desirable	£	80,229
3.6	A446 - Highway Safety Scheme	Essential	£	97,933