

Wycombe District Local Plan

Princes Risborough Area Transport Study

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1.1 Purpose of Report

Jacobs are framework consultants to the Transport for Buckinghamshire Alliance (TfB) between Ringway Jacobs and Buckinghamshire County Council (BCC). Under the terms of this contract, Jacobs are commissioned to undertake transport planning, modelling and assessment studies on behalf of the County Council, working in partnership with District Councils.

Jacobs has been commissioned by BCC and Wycombe District Council (WDC) to undertake a transport study. The study provides an evidence base which demonstrates the possible traffic implications of potential new land use development and considers a range of associated transportation infrastructure schemes. The evidence base will support and inform the development of the new Wycombe District Local Plan (WDLP).

This report is one of number of documents that form the background evidence for the new WDLP. This report contains an assessment of current and forecast traffic demand to identify the impacts of new land use development, taking into consideration findings from previous studies and relevant policy and strategy documents. Together, this information provides:

- *an assessment of the impact of additional housing and employment-related land use in and around the Princes Risborough urban area*
- *a comparative assessment of the forecast traffic and transportation implications of locating new land use development in particular areas*
- *the potential role of transport network improvements and new strategic transport infrastructure provision in mitigating the impact of new land use development*

From this assessment, an understanding of the likely traffic implications of new land use and potential associated highway infrastructure development in Princes Risborough area are established.

1.2 Background

In March 2012 the National Planning Policy Framework (NPPF) was published, consolidating policy statements, circulars and guidance documents into a single concise framework. The NPPF outlines the Government's economic, environmental and social planning priorities for England assisting the production of robust local and neighbourhood plans and development management decisions. Local planning authorities are required to prepare plans that accommodate new development; meeting objectively assessed local needs and priorities.

WDC is developing a new Local Plan for the District. Once adopted, the Plan (WDLP) will replace the adopted Core Strategy (2008) as well as the saved policies from the existing Local Plan (2004). WDLP will sit alongside the Delivery and Site Allocations (DSA) Plan for Town Centres and Managing Development document. WDC state that the new WDLP will:

- *set housing targets for the district and address strategic housing issues including housing and mixed use allocations*

- *include policies and proposals for the protection and provision of employment land*
- *include site specific proposals for local communities*
- *set detailed policies to manage development*

The overall objective of this study is to provide a series of assessments relating to potential land use development and possible associated transportation infrastructure requirements in Wycombe District. The study will create an evidence base that assists and supports the development of the new WDLP.

The study area for this assessment is outlined in Figure 1-A which includes the urban area of Princes Risborough and the villages of Monks Risborough and Little Kimble to the north east.

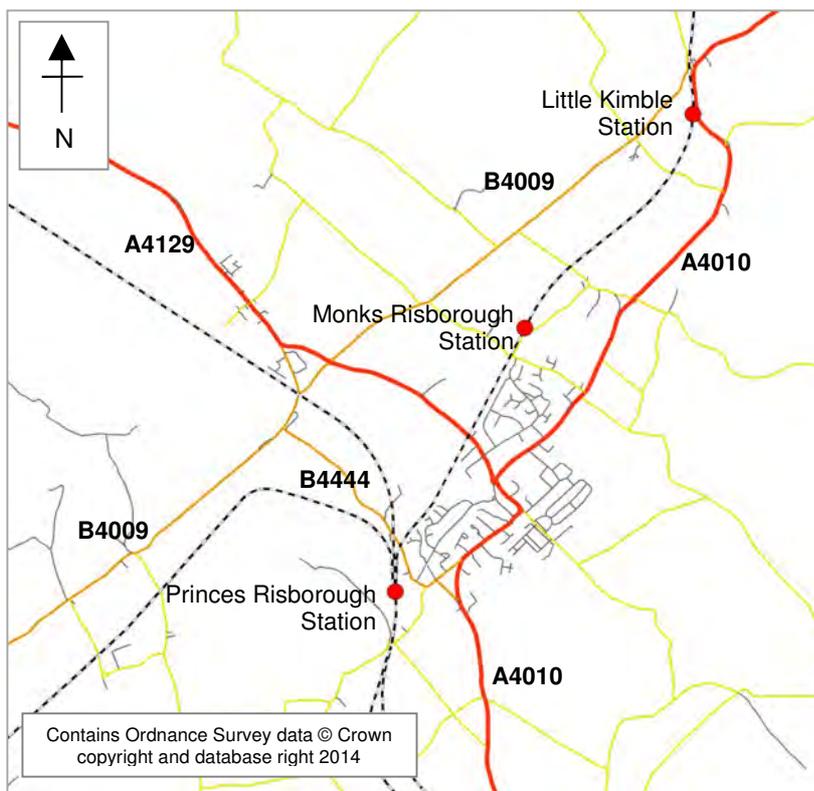


Figure 1-A Study area

1.3 Overview of Assessment

A stand-alone assessment tool has been developed for the Princes Risborough area, as no existing transport modelling tools were available. This tool consists of a spreadsheet-based network model supplemented by detailed junction assessment models to reflect a 2013 base year. Year 2031 Do Minimum scenarios have also been established and form the basis of the assessment of road network conditions for this area.

A forecast 2031 Do Minimum scenario has been developed to inform this assessment. This forecast scenario is consistent with National Trip End Model (NTEM) growth rates obtained from TEMPRO (see glossary in Appendix A). The 2031 Do Minimum scenario establishes a forecast of traffic conditions within the study area, against which various new land use and infrastructure scenarios can be assessed comparatively.

A series of land use and infrastructure scenarios for the Princes Risborough area has been identified in consultation with WDC and BCC. This assessment considers the impact of a number of associated strategic transport packages including a potential new Princes Risborough 'Western Relief Road'. Further information on the land use and infrastructure scenarios is presented later in this document.

It is important to note that the locations assessed for potential new land use development and transport infrastructure as part of this study reflect theoretical areas of change. These scenarios have been established to assist in the development of the Wycombe District Local Plan and are not related to any specific planning applications.

The scenarios are used to identify, in traffic performance terms, the impact of the sites and the impacts of a range of possible transport infrastructure measures.

1.4 Structure of Report

The structure of this transport study report is as follows:

- **Section 1** – *Introduction - Outlines the purpose and background of the report*
- **Section 2** – *Policy and Document Review - Reviews relevant policy and strategy documents identify Buckinghamshire's existing policies and programmes*
- **Section 3** – *Baseline Review - Describes existing transportation conditions to provide an understanding of existing traffic supply and demand in the study area*
- **Section 4** – *Princes Risborough area in 2031 - Presents the forecast traffic conditions under a 'Do Minimum' scenario and describes a number of key public transport and non-motorised user schemes*
- **Section 5** – *Land Use and Infrastructure Scenarios - Outlines the methodology for the traffic forecasting and modelling process and provides an overview of the theoretical land use and infrastructure scenarios*
- **Section 6** – *Traffic Assessment and Appraisal - Presents the results from the traffic forecasting and modelling process and describes the impacts of the land use and transport infrastructure scenarios*
- **Section 7** – *Summary and Conclusions - Presents a summary and the conclusions of the report*

2.1 Introduction

In assessing the impact of the land use development and transportation infrastructure scenarios within the study area, it is important to examine and review existing planning policies and objectives to ensure that any schemes assessed and conclusions drawn from this study are consistent with policy. This section outlines the key strategies and policies relating to planning and transport as articulated at the National, Regional and Local level.

Policy has been and continues to be in a state of change and development; therefore the information presented in this report is accurate at the time of writing but may change during the course of WDLP production.

2.2 Policy Review

2.2.1 National Policy

National Planning Policy Framework

Under the Coalition Government, planning policy has changed significantly. Outlined within the Local Growth White Paper¹, the focus for planning and future development is one that helps to deliver strong, sustainable and balanced growth, whilst also being tailored to local aspirations and requirements.

In March 2012, the Department for Communities and Local Government published the ‘National Planning Policy Framework (NPPF)’², which sets out the Government’s economic, environmental and social planning policies. The NPPF aims to reform the planning system and is underpinned by a presumption in favour of sustainable development which for plan making means that ‘local planning authorities should positively seek opportunities to meet the development needs of their area’. There is a focus on planning for prosperity, people and places, promoting increased levels of development and supporting infrastructure, whilst also protecting and enhancing the natural and historic environment. It is designed, however, to be interpreted and implemented locally; and delegates responsibility for achieving this vision to local planning authorities.

Localism Act

The Coalition Government’s Localism Act³ provides the legislative foundation for this change. The Act decentralises power, giving local government new freedom and flexibilities; provides new rights and powers for communities and individuals; reforms the planning system; and enables decisions to be taken locally.

The Coalition Government’s vision for transport is also one that encourages growth, but is greener, safer and improves the quality of life in our communities. The Government’s transport priorities and key actions in order to deliver this national

¹ Local growth: realising every place’s potential <http://www.bis.gov.uk/assets/biscore/economic-development/docs/cm7961-local-growth-white-paper.pdf>

² National Planning Policy Framework <http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>

³ Decentralisation and the Localism Bill: an essential guide <http://www.communities.gov.uk/documents/localgovernment/pdf/1793908.pdf>

vision are set out within the Department for Transport's (DfT) Business Plan⁴, which is updated annually. There is a focus on improving road safety, reducing congestion and pollution and making changes at a local level. The 'Local Transport White Paper – Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen'⁵ published in January 2011 sets out the Coalition Government's vision for a sustainable local transport system that supports the economy and reduces carbon emissions. The focus is on enabling local authorities to meet local transport needs, through a simplified approach to funding and increased power and flexibility. It emphasises that effective sustainable local transport is achieved through solutions developed for the places they serve, tailored for the specific needs and behaviour patterns of individual communities.

2.2.2 Regional / Local Policy and Guidance

The Buckinghamshire Thames Valley Local Enterprise Partnership

Included in the Localism Act is the power to abolish Regional Spatial Strategies and with that the South East Plan, which previously set out the region's targets for housing, economy, transport and environmental challenges. Local Enterprise Partnerships (LEPs) have taken on Regional Development Agencies' role in this process, with Wycombe District forming part of the Buckinghamshire Thames Valley LEP (BTVLEP).

The vision of the BTVLEP is 'to create a vibrant, balanced, competitive Buckinghamshire economy' through providing the 'conditions that support business to invest, grow, and thrive'⁶. A number of key objectives are identified for the period 2012-2031 in order to achieve this vision. These include a focus on bringing forward the necessary business-critical infrastructure and ensuring major transport infrastructure is fit for its economic purpose.

Buckinghamshire's Local Transport Plan 2011-2016

Buckinghamshire's Local Transport Plan 2011-2016⁷ was adopted in April 2011. It is the third Local Transport Plan (LTP3) for the county, setting out policies, strategies and priorities to address transport related issues and challenges across the five years to March 2016. The LTP3 is focused on addressing the five themes of the Sustainable Communities Strategy⁸ (SCS), which sets the long-term plan for the county up to 2026:

- *delivering a thriving economy*
- *sustainable environment*
- *safer communities*
- *health and wellbeing*
- *cohesive and strong communities*

In supporting the delivery of a thriving economy, LTP3 recognises that encouraging employment growth in the county and delivering sustainable housing growth are two

⁴ Business Plan 2013-15 <http://transparency.number10.gov.uk/business-plan/11>

⁵ Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen <http://www.official-documents.gov.uk/document/cm79/7996/7996.pdf>

⁶ Buckinghamshire Local Enterprise Thames Valley Partnership 2012 – 2031 - Plan for Sustainable Economic Growth in the Entrepreneurial Heart of Britain http://buckstvlpe.co.uk/uploads/downloads/SEQ129_BBF_BusinessPlan_0912_LOW-1.pdf

⁷ Buckinghamshire's Local Transport Plan 2011-2016 <http://www.tfbucks.co.uk/documents/ltp/LTP3.pdf>

⁸ Sustainable Community Strategy for Buckinghamshire 2009–2026 http://www.buckinghamshirepartnership.gov.uk/assets/content/Partnerships/BSP/docs/bsp_scs_visual_county.pdf

key challenges. Within the District, Princes Risborough is identified as an area where the vitality of the area is a key issue relevant to the Plan. Other themes relevant to this area include:

- *air quality*
- *commuting pressure*
- *rural accessibility*
- *development pressure on the high quality environment*

Local Area Strategy – North West Chilterns (2011-16)

The County LTP3 Strategy is supported by the Local Area Strategy⁹ for the North West Chilterns, covering the same period. The Local Area Strategy seeks to deliver enhanced access and ease of movement for a vibrant bustling community. The urban strategy sets out the following priorities:

- *manage the challenge of residential and employment growth*
- *manage the negative impacts of the A4010*
- *access between princes Risborough centre and rail station*
- *parking provision and management*

The approach contains a mix of schemes and initiatives involving the transfer of journeys to sustainable modes, improvements to public realm, traffic management on primary routes, and longer term solutions to managing the A4010 traffic flows.

Wycombe Local Development Framework

WDC has an emerging Local Development Framework comprising the following:

- *adopted Core Strategy 2008¹⁰*
- *emerging New Wycombe District Local Plan¹¹*
- *Delivery and Site Allocations (DSA) Plan, June 2012¹²*
- *Wycombe Infrastructure Delivery Plan (IDP), May 2012¹³*

The adopted Core Strategy sets out the vision and spatial strategy for Wycombe District up to 2026. The focus is on setting the overarching principles to achieve sustainable development and locational principles for new land use development.

Policy CS6 describes Princes Risborough as a vibrant market town and lists six key policy development areas which are Community, Economy, Transport and Access, Tourism, Town Centre and Environment. In relation to Community, the Policy sets out the need to ‘identify specific opportunities to provide a minimum of 480 new dwellings’ within the plan period (to 2026). In terms of Transport and Access, the Core Strategy policy sets out the intention to:

- *Review the key transport issues in the town, including the divisive effect of through traffic on the A4010 passing through the heart of the town (as part of*

⁹ Local Transport Plan Local Area Strategies

http://www.tfbucks.co.uk/documents/ltp/LTP3_Local_area_strategies.pdf

¹⁰ Adopted Core Strategy <http://www.wycombe.gov.uk/council-services/planning-and-buildings/planning-policy/wycombe-development-framework/adopted-core-strategy.aspx>

¹¹ New Local Plan <http://www.wycombe.gov.uk/council-services/planning-and-buildings/planning-policy/new-local-plan.aspx>

¹² Delivery and Site Allocations Plan <http://www.wycombe.gov.uk/council-services/planning-and-buildings/planning-policy/delivery-and-site-allocations-plan-examination.aspx>

¹³ Wycombe Infrastructure Delivery Plan <http://www.wycombe.gov.uk/council-services/planning-and-buildings/planning-policy/community-infrastructure-levy/examination.aspx>

a strategic review) and the relationship between vehicles and pedestrians in the High Street and town centre

- *Improve access to the station and secure appropriate levels of station car parking*

The emerging WDLP will replace the adopted Core Strategy as well as the saved policies from the existing Local Plan (2004). The new WDLP will also address economic issues and identify land for business development. The need for a new WDLP is triggered by the abolition of the South East Plan housing targets through the Localism Bill, which informed the adopted WDC Core Strategy. The new WDLP will set housing targets for the District and address strategic housing and economic issues. It will also set out the detailed policies to manage development.

The DSA translates the high level policies of the Core Strategy into more detailed policies and site specific allocations for town centres. It also identifies and plans the delivery of the infrastructure needed to support this development. The DSA includes 'District-wide Development Management Policies' as per policy DM2 which aims to tackle the transport related challenges created by major developments and adds further detail to supplement Core Strategy policy CS20.

This policy states 'all developments that require the submission of a Transport Assessment, in line with Appendix B of the DfT Guidance on Transport Assessment (March 2007), or any replacement to this guidance, or as required by the Highway Authority, should provide' a range of transport improvements relating to:

- *public transport*
- *walking and cycling*
- *travel plans*
- *car clubs*
- *car sharing*

The design of development should allow for bus penetration through the sites and priority bus routing, traffic management that ensures queues are managed in a way that mitigates their impact on the primary highway network, and layout and design that realises high quality places that are not dominated by the needs of vehicular traffic. WDC will as far as practicable seek to ensure that new development has a neutral effect on the highway network.

Community Infrastructure Levy (CIL)

The Wycombe CIL was formally introduced in 2012. CIL is a local tariff that enables Local Authorities to set a charge for most types of new land use development. The money is available to fund a wide range of local and strategic infrastructure that is required as result of development such as transport schemes, green infrastructure, schools and community facilities.

The DSA sets out that 'it is vitally important that new development provides appropriate measures to encourage sustainable transport behaviour as well as, through the CIL, contributions towards the wider strategy as produced by the County Council so as to offset the wider traffic impacts and meet the travel needs of users of the development'.

3.1 Introduction

This section reviews the existing population, land use and transportation infrastructure supply and demand. Travel conditions within the study area are described using a variety of existing data sources including traffic volume, journey patterns, and congestion and delay. Provision for public transport and non-motorised users is described with data related to travel volumes where available.

3.2 Modelling Approach

A spreadsheet-based network model has been developed covering all major road links within the study area. For each link, traffic volume data is available from observed surveys (see Appendix B) and an estimate of link capacity has been established from the Design Manual for Roads and Bridges (DMRB)¹⁴. A ratio of link flow to link capacity (RFC) has been calculated for each link.

To supplement the network model, a set of junction models has been developed. The Transport Research Laboratory (TRL) software packages ARCADY (for roundabouts) and PICADY (for priority junctions) have been used for this purpose. Ten key junctions have been selected on the basis of known congestion issues and particular locations that could be affected by increases in traffic volumes.

Manual classified count information (traffic counts that show different types of vehicles) has informed the development of the model for each junction and a list of data used as part of this assessment is presented in Appendix B. The full set of ARCADY and PICADY output is presented in Appendix C for all scenarios considered in this report.

3.3 Population Characteristics

At the time of the 2011 Census, the study area (see Figure 1-A) had a total population of 8,439. Of these, 8,292 resided in 3,637 households. The remainder were resident in communal establishments e.g. care homes, boarding schools. Figure 3-A shows the percentage of households owning various numbers of vehicles within the study area.

Overall, 82% of households have access to at least one car or van. This is slightly lower than the overall figure for Wycombe District which is 86%, but higher than the 74% average for England. The main means of travel to work for working age (16 – 74) residents who reside in the study area is shown in Figure 3-B.

¹⁴ <http://www.dft.gov.uk/ha/standards/dmr/vol5/section1/ta7999.pdf>

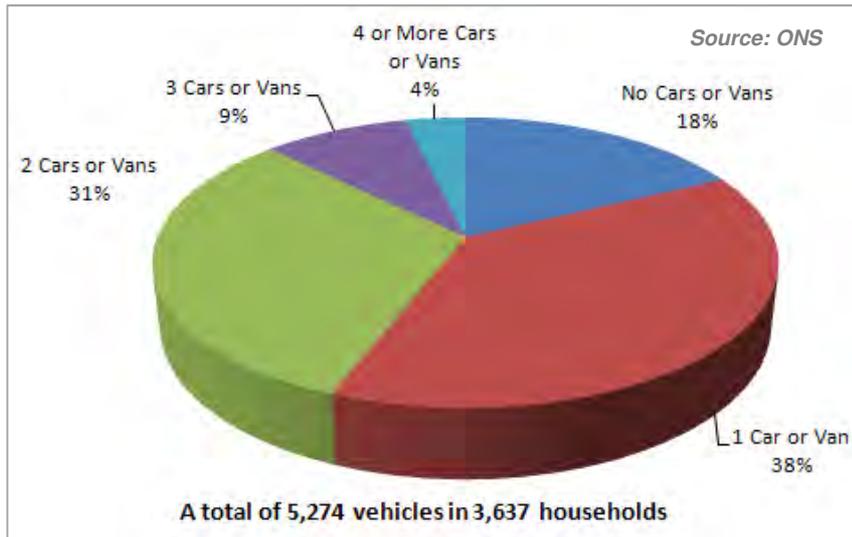


Figure 3-A 2011 Census household vehicle ownership

A total of 43% of working age residents drive a car or van as their main method of travel to work, with 8% using public transport. The corresponding percentage for those driving a car or van for this purpose in England is 37%, with 11% using public transport. The statistics for Wycombe District are similar to those for the study area. Overall, the study area is characterised by relatively high car ownership and a relatively high proportion of travel to work by car or van.

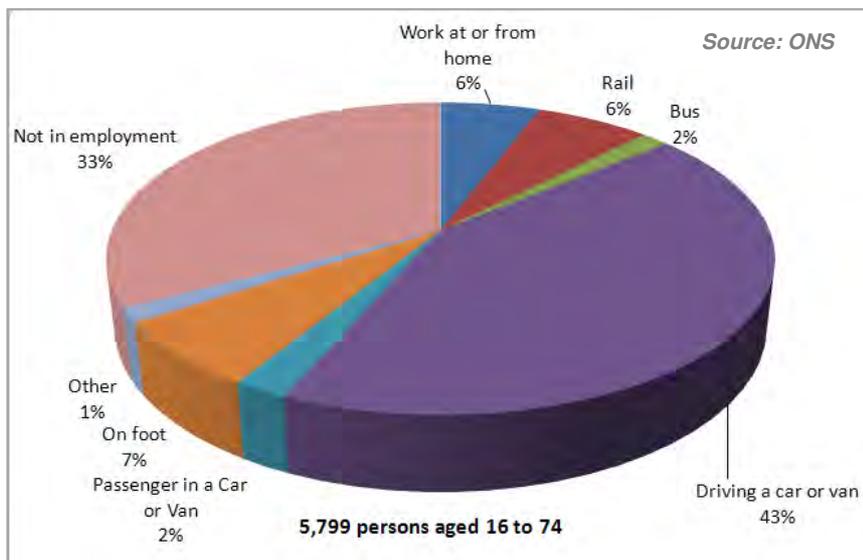


Figure 3-B 2011 Census main method of travel to work

3.4 Highway Network

Princes Risborough is located in south - central Buckinghamshire, situated approximately 8 miles north-west of High Wycombe and 9 miles south-west of Aylesbury. The highway network is shown in Figure 3-C.



Figure 3-C Local highway network

Princes Risborough lies on the A4010 which is the primary north-south route between Aylesbury and High Wycombe. The closest access to the strategic road network is via the M40 Junction 4 at High Wycombe (10 miles to the south) or the M40 Junction 6 at Lewknor (9 miles to the south-west). The M40 Junction 5 at Stokenchurch offers less direct access for journeys from Princes Risborough.

The primary destinations around Princes Risborough include Aylesbury and Leighton Buzzard to the north, Thame and Oxford to the west, High Wycombe and the Thames Valley to the south, and Amersham to the east. Road access to the north and south is provided by the A4010; however other roads are of lower standard, particularly to the east.

Princes Risborough town centre is served by four key access points. In addition to the A4010 (north and south), access from the north-west is via the A4129 Thame Road and to the south-west via the B4009 Lower Icknield Way. The primary route converges in the town centre at New Road, with roundabouts at Longwick Road / Aylesbury Road and at Bell Street.

(a) Traffic Volumes

The 2013 base year network model reflects current traffic conditions. The model has been used to present the typical traffic volumes in the Princes Risborough area. Details of the development of the network model are provided in section 4.2. Figures 3-D and 3-E show the 2013 base modelled traffic volumes for the AM and PM peaks respectively.

The north – south A4010 accommodates the highest traffic volumes within the study area and exhibits a tidal pattern of flow. The southbound direction accommodates the highest traffic volumes in the AM peak and correspondingly the northbound direction accommodates the highest traffic volumes in the PM peak. The A4010 (north) is the more heavily used route for traffic in comparison to the A4010 (south), with two-way traffic volumes some 350 to 450 vehicles higher to the north.

The busiest road link in the network is on the A4010 New Road in the town centre with traffic volumes reaching around 950 in the AM peak and 1,100 in the PM peak in each direction. Two-way traffic volumes on this link are around 1,700 vehicles per hour in each peak hour.

The Lower Icknield Way corridor exhibits a similar tidal pattern of movement, although with lower volumes than the A4010. Traffic volumes reach around 650 in the AM peak in a southbound direction and 600 northbound in the PM peak. Two-way traffic volumes are in the order of 1,000 to 1,100.

The connecting routes of Summerleys Road, Longwick Road, Mill Lane and Cadsdean Road accommodate markedly less traffic volumes than the two north-south corridors. Of the four corridors, Longwick Road is the most heavily used and is considered to retain both a local and a strategic (longer distance) function. Based on an analysis of traffic volumes only, the other routes would appear to be predominantly used by local traffic only.

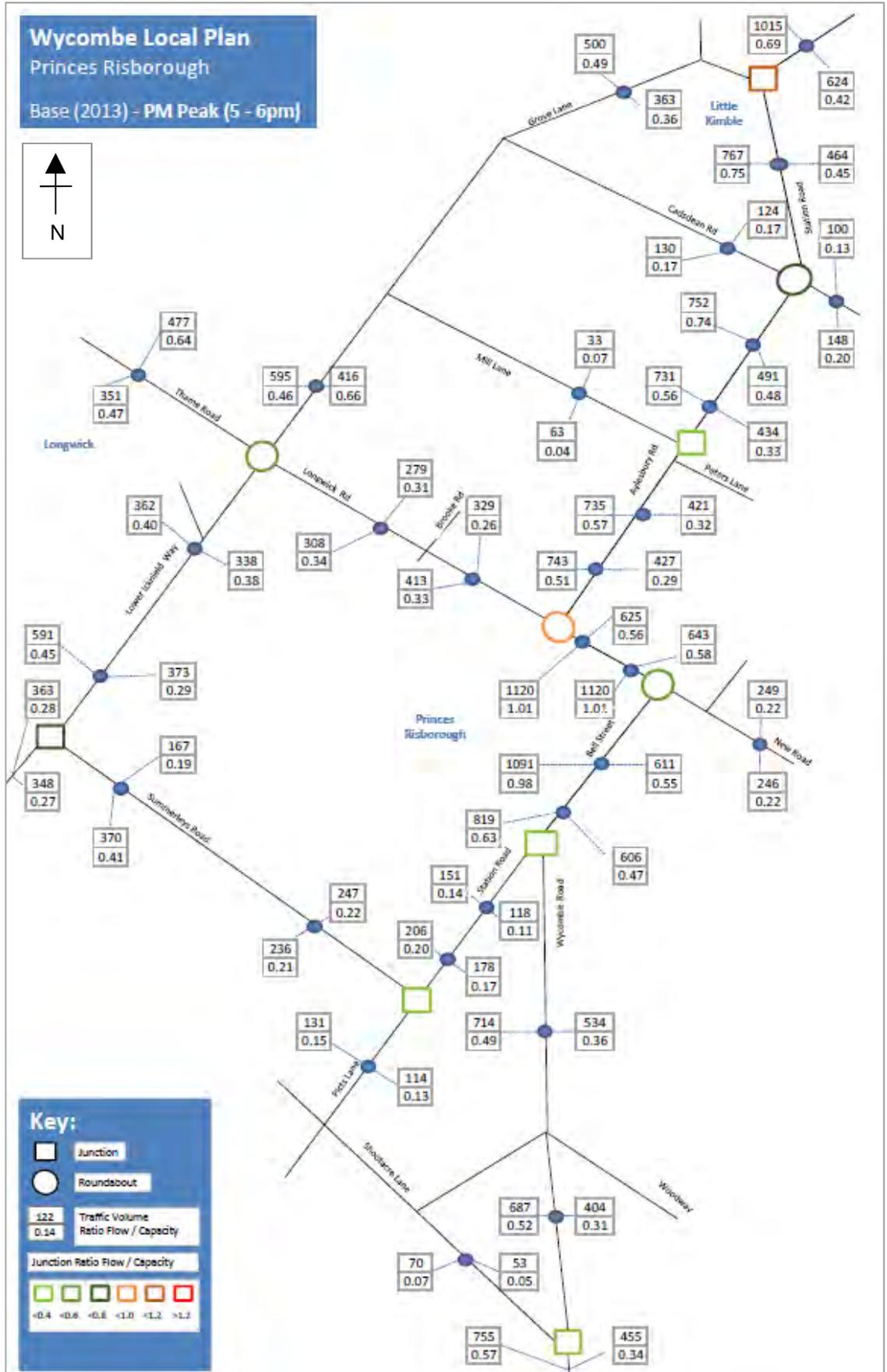


Figure 3-E 2013 Base - PM peak modelled traffic analysis

(b) Journey Patterns

A transport model is not available to provide information associated with wider journey patterns in the area. However, it is understood that an important feature of the operation of the local road network is a dominant north-south movement of traffic through the town between Aylesbury and High Wycombe in each peak period. An Automatic Number Plate Recognition (ANPR) survey was undertaken to quantify the volume and proportion of trips undertaking the north-south through movement during the peak hours. Figure 3-F illustrates the results of the survey. The information shows the total number of vehicles recorded, the total number travelling through the town, and the corresponding percentage of through trips.

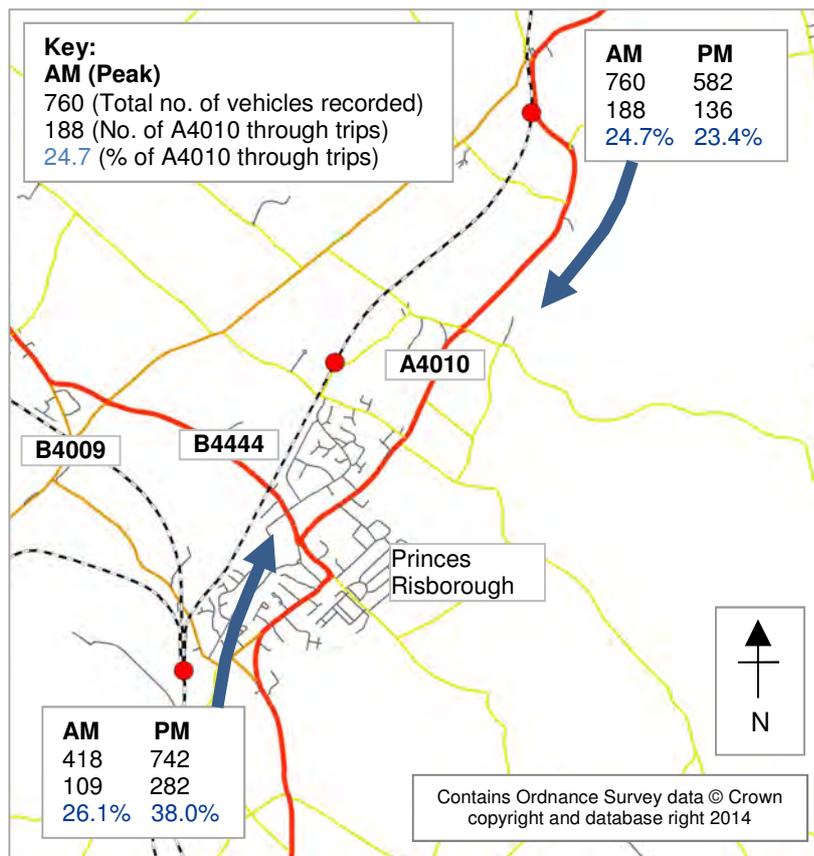


Figure 3-F 2013 AM and PM peak A4010 through trips

The information illustrates a strong southbound pattern in the AM peak and northbound pattern in the PM peak. In the southbound direction almost 25% of all traffic entering the area from the A4010 (north) has a destination at the A4010 (south). In the northbound direction the AM peak exhibits a similar proportion that increases to 38% in the PM peak when through trips are most predominant. This discrepancy may reflect an earlier peak in through trips in the AM peak as longer distance journeys may begin earlier to reach destinations in High Wycombe and the Thames Valley for example.

The total volume and proportion of external trips in the Princes Risborough area is likely to be higher still, as the other through-trips (including those between the A4010 (north) and B4009 (south-west)) are not accounted for. Using analysis from modelling data, the total proportion of through trips for other towns in Buckinghamshire has been shown to range from 13% in Aylesbury to 29% in High Wycombe and up to 40% in Buckingham.

High Wycombe and Buckingham are shown to have higher proportions of through trips as a result of the influence of longer distance strategic routes including the A4010 and the A421 for example. It is considered likely based on the ANPR analysis that the total proportion of through trips in Princes Risborough would be relatively high, and could be similar to that of Buckingham.

(c) Ratio Flow to Capacity and Junction Delay

Congestion within a network can result from road link or junction capacity constraints. A link (a section of road from one junction to another) that operates well within capacity may still experience congestion as a result of a constrained junction layout, for example.

The Princes Risborough area is characterised by single carriageway roads of varying standard. The areas of the road network most under pressure are consistent with the areas where traffic volumes are highest. In both peaks, the A4010 New Road link and the Bell Street link are shown to have the highest ratio of flow to capacity and therefore typically the highest levels of journey time and congestion. In the AM peak these links remain within capacity but in the PM peak the northbound link on New Street has reached capacity. The link on Bell Street operates just within capacity. In other areas of the road network, the road links operate well within capacity.

In terms of junction delays, the performance of ten key junctions has been assessed in detail. The results of this assessment are indicated on Figures 3-D and 3-E, above and are quantified in Table 3-A, below. The level of maximum delay is shown as '<0.2' where maximum delays are relatively low.

No.	Junction Location	AM Peak		PM Peak	
		RFC	Max Delay (min/veh)	RFC	Max Delay (min/veh)
1	A4010 / Mill Lane	0.12	0.2	0.08	0.2
2	A4010 / Station Rd	0.46	0.2	0.35	0.2
3	Station Rd/ Picts Lane	0.18	<0.2	0.15	<0.2
4	A4010 / Grove Lane	0.82	0.4	1.06	2.3
5	Summerleys Rd / Lower Icknield Way	0.24	<0.2	0.64	0.2
6	Shootacre Lane / Wycombe Rd	0.14	0.2	0.18	0.2
7	A4010 New Road / Bell Street	0.71	<0.2	0.60	<0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	0.84	0.3	0.84	0.5
9	A4010 / Cadsdean Rd	0.59	<0.2	0.64	0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	0.61	0.2	0.42	<0.2

Table 3-A 2013 AM and PM peak junction RFC and delay

For priority junctions (those not controlled by signals), an RFC of 1.00 represents the theoretical capacity limit. However, a value of 0.85 is typically used to assess junction performance, with any junction exceeding this level likely to experience an increased prevalence of queuing and congestion.

In the AM peak, all junctions operate within an RFC of 0.85. The junctions most under pressure are the Longwick Road / Aylesbury Road / New Road roundabout adjacent to the Tesco superstore, and the A4010 / Grove Lane junction at Little Kimble. All other junctions operate well within capacity.

In the PM peak, the junction of A4010 / Grove Lane is shown to be most under pressure and has exceeded capacity. The arm of the junction that has exceeded its capacity is Grove Lane. The New Road / Longwick Road / Aylesbury Road roundabout is also under greater pressure in the AM and PM peak and is close to an RFC of 0.85. All other junctions operate well within capacity.

(d) Air Quality

Princes Risborough is not within a designated or planned Air Quality Management Area (AQMA). However, data has been collected in recent years using Nitrogen Dioxide Diffusion Tubes at the roadside adjacent to the junction of Bell Street / New Road. The data¹⁵ indicates a reduction in annual mean concentrations of Nitrogen Dioxide from 2008 to 2012. However, reduced levels of air quality may be expected in areas subject to slow moving peak hour congestion, this could potentially include the A4010, for example.

3.5 Public Transport

(a) Rail

The Chiltern Railways line passes through Princes Risborough just south of a point where the track diverges to form a line continuing north-east to Aylesbury, a line continuing north-west towards Bicester, Warwick and Birmingham and a line to Chinnor. The line that diverges to the north-east passes through stations at Monks Risborough and Little Kimble. The Chinnor line is recreational steam rail line only and does not provide regular services.

Princes Risborough station is located in the south-west of the town and is accessed via the B4444 Station Road and is a 15 - 20 minute walk from the town centre. Table 3-B summarises the number of trains stopping at Princes Risborough during weekdays and weekends. The Birmingham line operates with an approximately half hourly service frequency, with the Aylesbury line approximately hourly. The Aylesbury line is single track throughout, with no passing places and therefore runs with relatively low operating speeds. The Chiltern Rail network is presented in Appendix D.

Route	No. of Services per day
Kidderminster-Birmingham-Statford Upon Avon-London Aylesbury-High Wycombe-London	Mon-Fri: 66 trains (05:20-23:19) Sa: 50 trains (05:30-23:01) Su: 38 trains (07:39-22:51)
London- Statford Upon Avon- Birmingham-Kidderminster London- High Wycombe- Aylesbury	Mon-Fri: 72 trains (06:17-01:24) Sa: 52 trains (06:23-01:09) Su: 46 trains (08:23-00:48)

Table 3-B Princes Risborough rail service frequency

¹⁵ 2013 Air Quality Progress Report: Wycombe District Council (May 2013). Air Quality Consultants.

Figures 3-G and 3-H present a summary of the total entries and exits for each station between 2007/8 and 2011/12. Any comparison of the figures should recognise that the information is presented using different graph scales. This is due to the significant difference in the volume of entries and exits at Princes Risborough station compared with Monks Risborough and Little Kimble stations.

The volume of entries and exits at the three stations has fluctuated in recent years. There was a general declining trend at Princes Risborough and Monks Risborough from 2007-8 to 2010-11 followed by a marked increase to 2011-12. There has been a steady increase at Little Kimble which is the least used of the three stations.

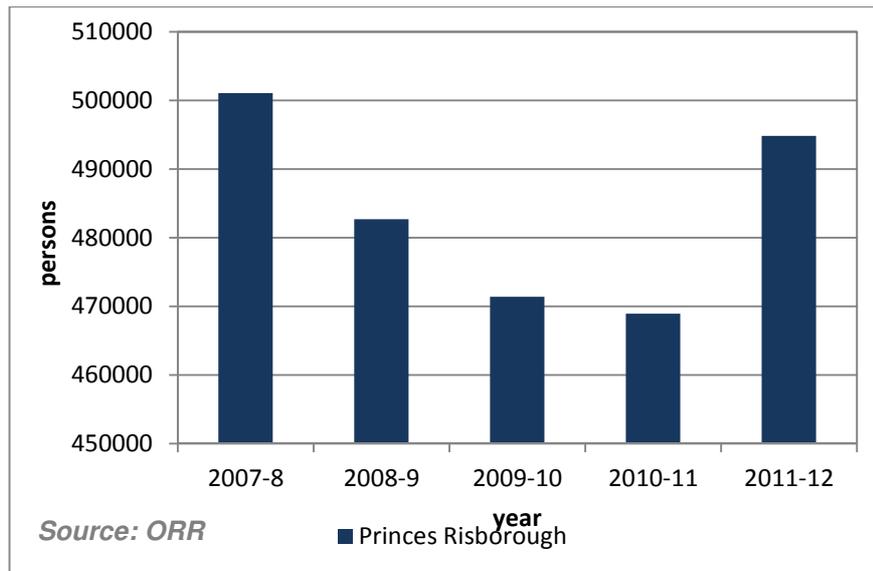


Figure 3-G Summary of total entries and exits – Princes Risborough station

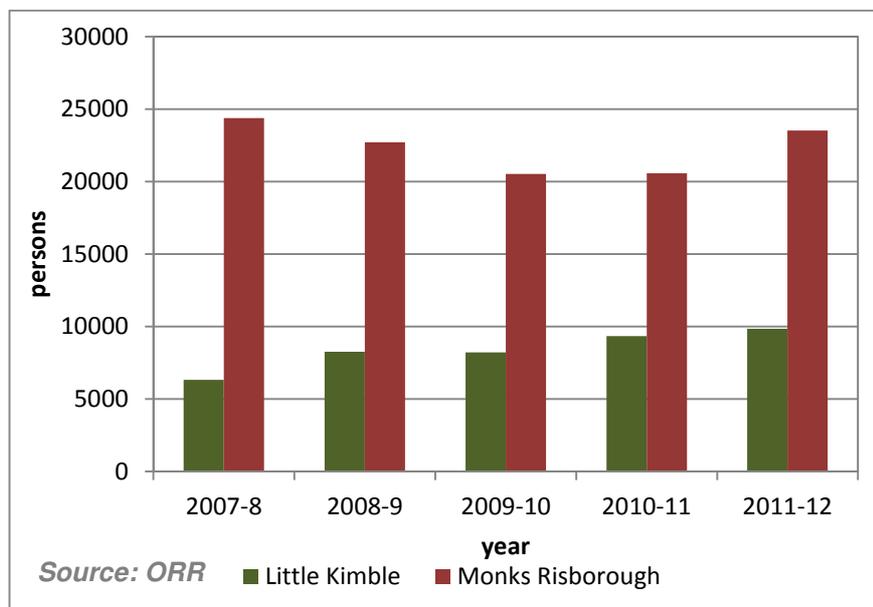


Figure 3-H Summary of total entries and exits – Little Kimble / Monks Risborough

(b) Bus

In the Princes Risborough area, a number of bus services operate as summarised in Table 3-C. The most frequent service is Route 300 which connects Aylesbury and High Wycombe via Princes Risborough. This service operates 2 - 3 journeys per

hour during a typical weekday and 1 - 3 journeys per hour during the weekends. Service no. 321 operates on a similar route and provides for 7 journeys per day. These services pass through the area on the A4010 and do not directly serve the train stations.

The Risborough Community Buses (RCB) operate on 6 different routes, connecting the neighbourhoods within Princes Risborough and some of these services also serve the train station. These services are low frequency with 2 - 6 journeys per day and do not operate on Sundays. Other routes connect Princes Risborough with the neighbouring areas of Chinnor, Thame and Brill and they operate at relatively low frequencies and typically only during weekdays.

Route No	Route Name	Frequency (each way)
300	High Wycombe - Princes Risborough - Aylesbury	Mon - Fri: 2-3/hour Sa: 1-3/hour Su: 1/hour
321	High Wycombe - Princes Risborough - Aylesbury	Mon - Fri: 7/day
21A	High Wycombe - Princes Risborough - Aylesbury	Mon - Fri: 1/day <i>School term only</i>
320	Chinnor – Princes Risborough - Chinnor	Mon - Fri: 7/day
120 & 121	Thame – Chinnor – Princes Risborough	Mon - Sat: 2/day
113	Oakley – Princes Risborough	Tue & Thu: 3/day
621	Downley (The Pastures) - Princes Risborough School	Mon - Fri: 1/day <i>School term only</i>
RCB: Risborough Community Buses	Monks Risborough Loop	Mon - Sat: 3-6/day
	Chestnut Rd/Northfield Rd Loop	Mon - Sat: 3-6/day
	Longwick Loop	Mon - Sat: 3-5/day
	Bledlow Ridge Loop	Wed & Fri: 2-3/day
	Speen Loop	Tue & Sat: 2-3/day
	Askett & Kimbles Loop	Mon & Thu: 2-3/day

Table 3-C Princes Risborough area bus routes

The bus services in Princes Risborough provide an opportunity to access a number of neighbouring settlements and wider destinations by sustainable means. Longer distance journeys are better provided for than local urban services in terms of frequency. There is a target within the LTP3 Implementation Plan for 85% of all bus services across the county to run on time and to increase bus patronage.

3.6 Non-motorised Users

(a) Cycling

Cycling makes up less than 1% of journey to work trips within the Princes Risborough area (Census 2011). Princes Risborough is relatively flat and borders a number of local and regional recreational routes in particular those associated with the Chilterns. However, the pattern of journey to work trips in the area is characterised by longer distance journeys where cycling is unlikely to offer a reasonable alternative to the private car. Notwithstanding this, it is considered there is significant potential to increase the level of cycling use in the area.

There are three cycle routes traversing the Princes Risborough area, most of which are on-road rather than traffic free routes. These routes include National Cycle Network (NCN) Route 57 which is a 69 mile route between Oxford and Thame. The

section from Thame to Princes Risborough follows the Phoenix Trail along a disused railway. The route enters Princes Risborough via Horsenden Lane and Picts Lane and passes through quiet residential streets before arriving at New Road. The route departs Princes Risborough via Kop Hill to the east.

The Icknield Way is a short cycle route between Princes Risborough station and New Road to the east as an alternative to the NCN R57. The Chilterns Cycleway passes close to Princes Risborough via a route using Brimmers Road and Kop Hill. These routes are presented in Figure 3-1¹⁶.

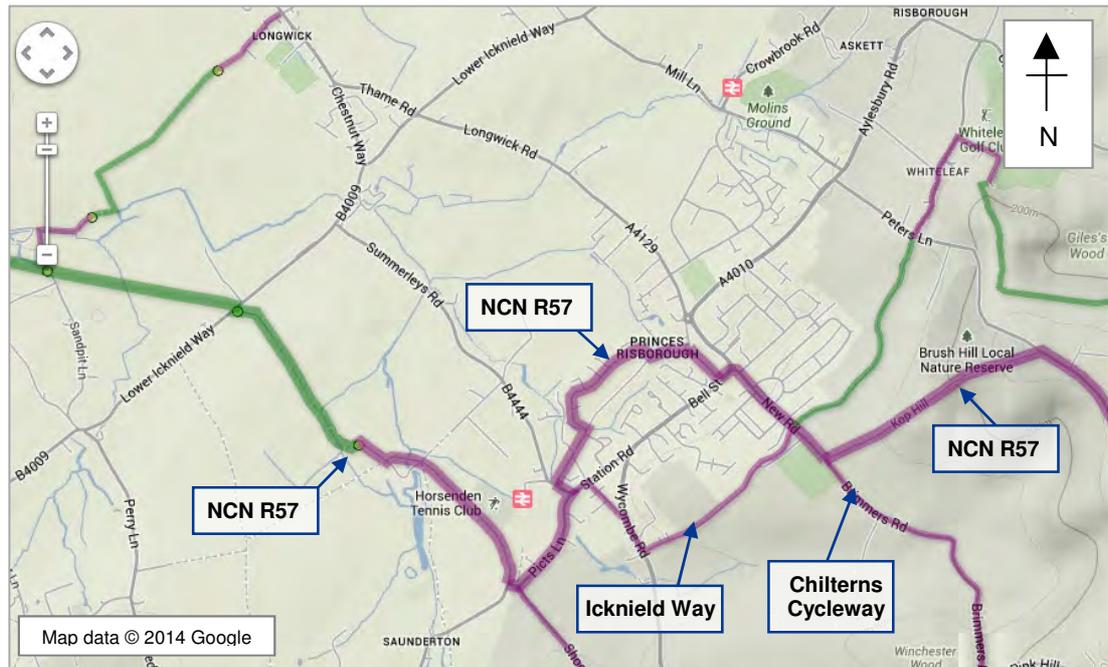


Figure 3-1 Princes Risborough area cycle route network

Note 1: Off-road routes indicated in green, on-road routes indicated in purple

(b) Walking

According to the 2011 Census, 7% of people travel on foot as part of their journey to work within the Princes Risborough area. The potential for walking as a transport mode for local trips is good given the size and topography of the area. The A4010 severs areas of the town in two and is a barrier to the attractiveness of east – west journeys on foot. A number of pedestrian crossings have been provided to assist pedestrians including zebra crossings on New Road and on the northern arm of the New Road / Longwick Road / Aylesbury Road roundabout. There are also two signalised crossings on Bell Street in the vicinity of High Street and just south of Park Street and one further signalised crossing to the north near Windsor Hill.

The main walking routes to Princes Risborough station from the town centre and main urban areas are via the A4010 and Station Road and via Manor Park Avenue which connects with the High Street.

3.7 Summary

This section has set out information which describes the current supply of and demand for transport within the Princes Risborough area. The information is based

¹⁶ Sustrans <http://www.sustrans.org.uk/ncn/map>

on observed data and network modelling tools, and reflects the current typical transport volumes, journey patterns, and delays in the area. The provision for and use of public transport and non-motorised users is described to provide context to later sections of this report.

The A4010 is a major influence on the transport conditions in the areas. This route passes through the town centre and provides for longer distance journeys to the north via Aylesbury and to the south via High Wycombe. This route is understood to be congested at peak times with delays at a number of junctions including the New Road / Longwick Road / Aylesbury Road roundabout. The road links through the town centre are approaching or at capacity. However, congestion is typically limited to a proportion of the peak hour only and conditions quickly return to free flow operation. Significant delays are limited to a small number of key junctions only.

This baseline review has set the context for the assessment of forecast scenarios including land use and transport mitigation packages. As such, this evidence is a basis for assessing the implications for the Princes Risborough area of increasing volumes of traffic which may result from new land use development options.

4 Princes Risborough Area in 2031

4.1 Introduction

This section provides an assessment of the forecast transport conditions in the Princes Risborough area in 2031 without the new land use development options that are being considered in WDLP. The traffic data in this section is derived from a spreadsheet-based network model and set of stand-alone junction models.

4.2 Modelling Approach

The spreadsheet-based link network model described in section 3.2 has been used as a basis for developing a forecast scenario.

A 2031 Do Minimum scenario has been developed to provide a reference for comparison with the WDLP scenarios. The level of growth has been taken from the National Trip End Model (NTEM) via the TEMPRO database (version 6.2). Income and fuel price adjustment factors were applied directly to base year traffic volumes. The resulting level of growth forecast in the 2031 Do Minimum scenario is consistent with TEMPRO growth rates (also see Appendix A – glossary).

The spreadsheet-based link network model does not forecast the re-assignment of traffic from one route to another as a result of increasing levels of congestion. Therefore, the assessment assumes journey patterns would remain consistent with current observed conditions.

4.3 Highway Network

(a) Traffic Volumes

Figures 4-A and 4-B present the forecast traffic volumes in the 2031 AM and PM peak hours. The data derived from TEMPRO suggests significant growth in traffic volumes by 2031. In terms of overall traffic growth for the Princes Risborough area, there is forecast to be an increase of 20.9% in the AM and PM peaks associated with:

- *new land use development generating new travel demand*
- *changes in fuel price and income affecting travel choices*
- *demographic factors including population age profiles which affect timing and purpose of travel*

It is noteworthy that expected growth in the volume of traffic has not materialised on the local road network in recent years. Observed DfT count data shows marked reductions in traffic volume on the approaches to the Princes Risborough area since the year 2000 (see Appendix E) with an overall reduction in traffic volume of 7%. This suggests these growth forecasts may over-estimate eventual conditions in terms of traffic volumes. Furthermore, there is evidence¹⁷ which some experts suggest shows that the levels of traffic growth forecast by the various industry-standard databases will not materialise in future, and therefore transport conditions would be significantly better than set out in this report

¹⁷ Peak car use in Britain <http://www.parliament.uk/documents/commons-committees/transport/POST%20briefing%20on%20peak%20car.pdf>

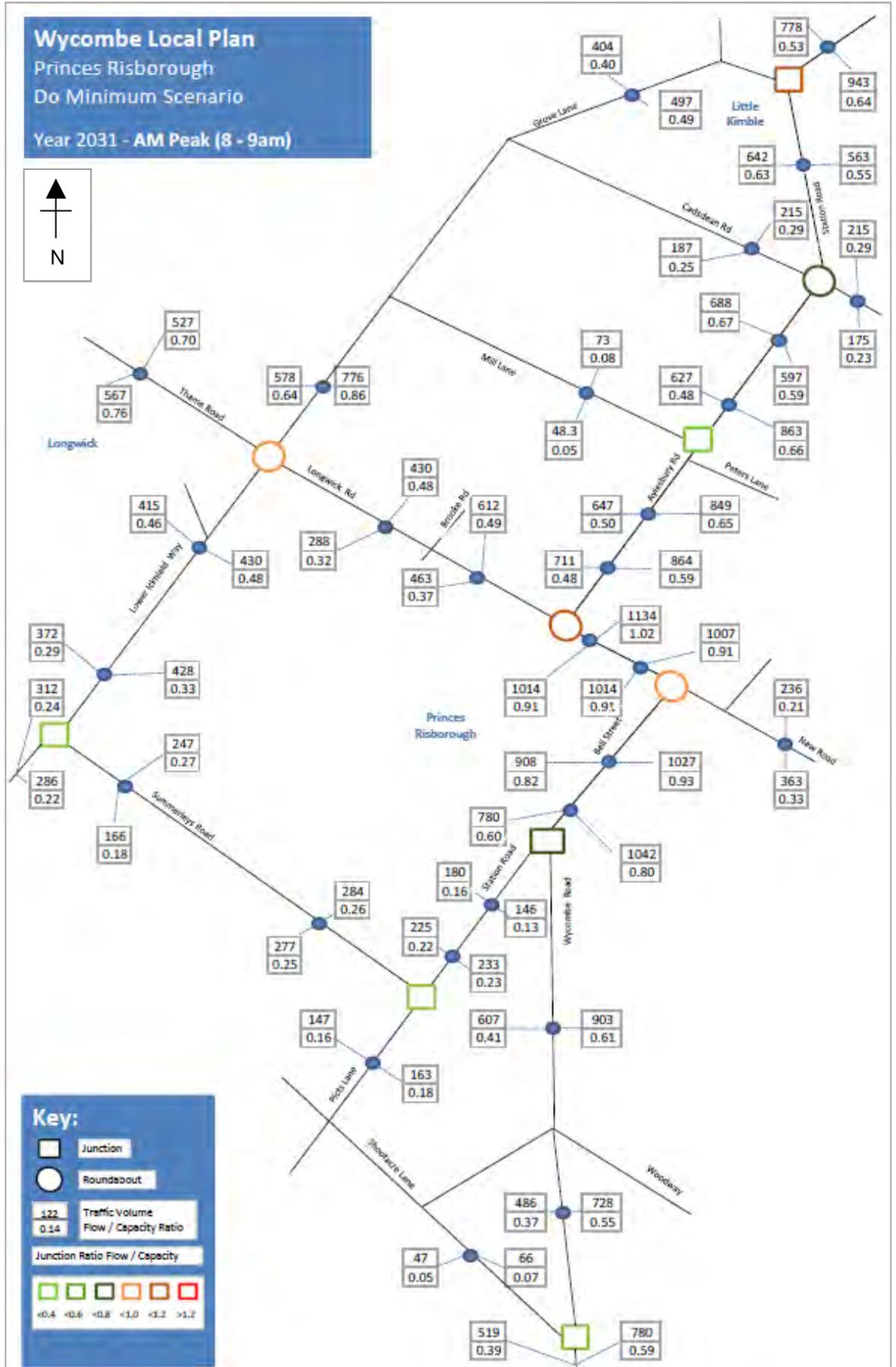


Figure 4-A 2031 Do Minimum AM Peak modelled traffic analysis

A proportional increase in traffic volume within a study area with limited routes would inevitably lead to greater absolute impacts in those areas already subject to relatively high levels of traffic volume. The traffic volumes on the A4010 New Road in the town centre are forecast to increase by approximately 200 vehicles to 1150 in the AM peak and by 250 vehicles to 1350 in the PM peak. This equates to around 4 additional vehicles per minute. Elsewhere along the A4010, traffic volumes typically increase by between 100 and 200 vehicles per hour per direction, or around 2 vehicles per minute.

On the Lower Icknield Way, traffic volumes are forecast to increase by approximately 100 vehicles to 750 in the AM peak and by 100 vehicles to 700 in the PM peak. On other more local routes, traffic volume increases are limited to less significant levels, typically less than 80 vehicles per hour per direction, or just over 1 additional vehicle per minute.

(b) Journey Patterns

This assessment does not model the re-assignment of traffic from one route to another as a result of increasing levels of congestion. Therefore, the assessment assumes journey patterns would remain consistent with current observed conditions.

The highest absolute changes in traffic volume are identified as being on the A4010, with growth in both local and longer distance through trips. This increase in traffic volume would add additional pressure to already congested junctions, in particular the New Road / Longwick Road / Aylesbury Road roundabout and the A4010 / Grove Lane junctions.

At the priority junctions including A4010 / Grove Lane, an increase in traffic on the main road is likely to result in more difficult egress conditions from the side roads. This could lead to a redistribution of traffic toward other less contested access points to the A4010, for example this could include Cadsdean Road and Mill Lane. This may result in a greater increase of traffic volumes on sensitive local routes.

(c) Ratio Flow to Capacity and Junction Delay

As traffic volumes increase by 2031, delays at junctions and RFC values on the road network would increase. The forecast delays and RFC's are shown in Figures 4-A and 4-B for the 2031 AM and PM peak Do Minimum forecasts respectively.

In both peaks, the A4010 New Road link and the Bell Street link are shown to have the highest RFC and therefore typically the highest levels of journey time and congestion. In the AM peak, the southbound direction of the New Street link is forecast to have reached capacity. In the PM peak, the northbound links on Bell Street and New Street have exceeded capacity, with RFC's indicated as 1.22 and 1.19 respectively. Other road links on the A4010 including Station Road to the north near Little Kimble are forecast to be approaching capacity. In other areas of the road network, the road links operate within capacity.

The results of the junction assessment are quantified in Table 4-A, below. The difference in junction delay compared to the base year scenario is also presented.

For each junction RFC and delay table, the level of max delay and delay difference (min / veh) is shown as '<0.2' where maximum delays are relatively low and '>10.0' where maximum delays are relatively high. Where delays reach relatively high levels the potential for traffic redistribution and 'rat running' would increase. Driver might

respond to significant levels of congestion by changing route should alternative more attractive routes be available to do so. This assessment does not consider the impact of any potential traffic redistribution effects.

No.	Junction Location	AM Peak			PM Peak		
		RFC	Max Delay (min/veh)	Delay Diff. * (min/veh)	RFC	Max Delay (min/veh)	Delay Diff. * (min/veh)
1	A4010 / Mill Lane	0.19	0.3	<0.2	0.12	0.3	<0.2
2	A4010 / Station Rd	0.72	0.3	<0.2	0.52	0.2	<0.2
3	Station Rd/ Picts Lane	0.23	<0.2	<0.2	0.18	<0.2	<0.2
4	A4010 / Grove Lane	1.17	2.1	1.7	1.52	9.6	7.3
5	Summerleys Rd / Lower Icknield Way	0.32	0.2	<0.2	0.86	0.4	0.2
6	Shootacre Lane / Wycombe Rd	0.19	0.2	<0.2	0.28	0.3	<0.2
7	A4010 New Road / Bell Street	0.86	0.2	<0.2	0.73	<0.2	<0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	1.07	1.2	0.9	1.28	4.5	3.9
9	A4010 / Cadsdean Rd	0.73	0.2	<0.2	0.78	0.2	<0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	0.88	0.3	<0.2	0.53	<0.2	<0.2

Table 4-A 2031 AM and PM peak junction RFC and delay

Note 1: Difference in level of delay at junction compared to 2013 base year

In the AM peak, the junctions of New Road / Longwick Road / Aylesbury Road and A4010 / Grove Lane have exceeded capacity. This has resulted in a marked deterioration in traffic conditions particularly at the latter with delays increased by around 100 seconds per vehicle on Grove Lane. The Lower Icknield Way (Little Kimble side) arm of the Thame Rd / Lower Icknield Way / Longwick Rd and Bell Street (High Wycombe side) arm of the New Road / Bell Street roundabouts are approaching capacity. All other junctions operate within capacity.

In the PM peak, the same junctions exceed capacity as per the AM peak, however conditions are markedly worse during this peak hour. Delays have increased to over 7 minutes on the Grove Lane arm of the A4010 junction and exceeded 4 minutes at the New Road / Longwick Road / Aylesbury Road junction. The Summerleys Road arm of the Lower Icknield Way junction is approaching capacity. All other junctions operate within capacity.

(d) Air Quality

An increase in traffic volume and corresponding reduction in speeds either as a result of congestion or as an intended feature of scheme design would result in a degradation in air quality. There is forecast to be potential for the degradation of conditions at key locations where link capacity issues and junction delays have increased, particularly within the town centre area at New Road and Bell Street.

4.4 Public Transport

BCC works with the DfT, public transport operators and developers in order to deliver public transport improvements for Buckinghamshire. There are forward plans

to upgrade existing bus stops with real time passenger information (RTPI) systems and other improvements across the District.

There are two related major sub-regional public transport projects that are expected to offer the potential for significant journey time and accessibility benefits for the Princes Risborough area. The benefits of the scheme have not been taken into account in the forecast modelling assessment so it is important that the results of the transport study are considered in this wider context.

Chiltern Railways Evergreen 3 / East West Rail

This project is the latest set of planned service improvements to be implemented as a part of Chiltern Railways franchise agreement. This follows earlier Evergreen 1 and 2 improvements which included track doubling between Bicester and Banbury, measures to improve line speed and signalling, and additional platforms at London Marylebone.

Chiltern Railways envisages operating two London – Oxford trains each hour in each direction throughout the day via the Princes Risborough line. Journey time improvements will be delivered by constructing a short connecting line just south of Bicester where the Chiltern Railways London to Birmingham line crosses over the planned East – West railway line.

This connection will facilitate wider journey options through the proposed East – West rail link between Oxford, Bletchley/Milton Keynes and onward journeys to East Anglia. Additional services will be provided between London Marylebone and Milton Keynes which will deliver a new route and significantly improved journey times toward Milton Keynes via Aylesbury.

4.5 Non-motorised Users

As part of the delivery of any 'committed' land use development sites, BCC and WDC would work with developers to ensure a package of transport measures for non-motorised users is delivered. These could include new infrastructure such as pedestrian crossings and widened footways to provide shared use footway/cycle paths, and soft measures such as travel planning.

In terms of ongoing scheme development within the area, BCC are progressing a scheme to provide a footbridge extension at Princes Risborough station to improve the links with the properties and sports facilities on the west side of the tracks. The scheme also has the potential to support possible land use changes on the west side of the railway line and would encourage the use of sustainable transport. The scheme is at an early stage of development and subject to further feasibility work.

4.6 Summary

This section has set out a forecast of traffic conditions in 2031 (without the land use development options discussed in the following sections). The growth in traffic volumes and changes in road link capacity and delay are described. This provides a reference for the consideration of WDLP land use developments and a basis for devising transport mitigation packages. Key improvements in public transport and provision for non-motorised users are also described.

5.1 Introduction

This section describes the land use and infrastructure scenarios that are assessed as part of this report. The Do Minimum forecast scenario described in section 4 reflects a level of traffic growth consistent with DfT NTEM for the Princes Risborough area 2031. Using this network model scenario as a reference, a number of land use development and transport infrastructure scenarios have been assessed.

This assessment considers three land use development scenarios developed by WDC for a range of development quantum to the west of Princes Risborough. Each scenario is accompanied by a potential transport mitigation package, developed for the purposes of this assessment. The transport mitigation packages are introduced in section 5.3 and presented in full in Appendix F.

5.2 Land Use Developments

The land use development quantum have been provided by WDC and a set of potential transport infrastructure packages have been developed and agreed with BCC and WDC. The location of the land use development sites are as follows:

- Scenario A – 400 homes – An area just north-west of the railway line to Aylesbury, south-west of Longwick Road
- Scenario B – 1000 homes – An area that extends from Summerleys Road, continuing to an area just north of Monks Risborough railway station, just north of the railway line to Aylesbury
- Scenario C – 2500 homes – An extensive area to the north-west of Princes Risborough from Summerleys Road north of the Chinnor railway line to an area just north of Monks Risborough station with a buffer area separating the site from Lower Icknield Way and Longwick.

Each land use scenario is primarily residential with an associated provision of local employment and other uses. A summary of the land use developments is presented in Table 5-A.

ID	Description	Type	Residential No. of dwellings
1	Scenario A - 400 Homes	residential	400
2	Scenario B - 1000 Homes	residential	1000
3	Scenario C - 2500 Homes	residential	2500

Table 5-A 2031 land use development sites

Table 5-B presents the assumed trip rate per dwelling for the residential development derived from relevant sites in the TRICS database. For the purposes of the assessment a 30% allocation of affordable homes is assumed. A split of 85% / 15% has been assumed for houses and flats.

Land use class	AM (08:00- 09:00)		PM (17:00- 18:00)	
	Arrive	Depart	Arrive	Depart
	Houses privately owned	0.143	0.419	0.418
Houses privately owned (affordable)	0.098	0.167	0.212	0.150
Flats privately owned	0.086	0.266	0.276	0.124
Flats privately owned (affordable)	0.073	0.103	0.108	0.095

Table 5-B Trip rates from TRICS database by land use class

Table 5-C shows the assumed traffic generation for each land use development site calculated from these trip rates.

The trip rates informing the traffic generation estimates have been established for the purposes of this assessment only. Local data would need to be collected to inform the development of revised trip rates. This would follow more detailed definition of the land use development as part of work associated with any possible planning application for each of the land use development sites. Trip rates would need to be agreed with the Highway Authority as part of this process.

ID	Description	AM (08:00 – 09:00)		PM (17:00-18:00)	
		Arrive	Depart	Arrive	Depart
1	Scenario A - 400 Homes	70	131	134	96
2	Scenario B - 1000 Homes	122	324	337	204
3	Scenario C - 2500 Homes	306	811	842	509

Table 5-C Traffic generation from land use development sites

In the absence of a highway assignment model, the traffic distribution for these scenarios is based on an analysis of census journey to work data. The data was used to estimate the route choice for all new land use development trips in the Princes Risborough area by forming an assumption about the use of a route for a particular origin / destination. For example, all journey to work trip from Princes Risborough to Aylesbury would have been assumed to travel via the A4010 (north). In each scenario the most appropriate and direct route would have been assumed for the journey from the new area of land use development.

This process resulted in the following assumptions regarding the assignment of traffic in the network model. Origin and destination trips were assumed to have the same distribution (i.e. the same route was used for both the outward and return steps of a journey).

- A4010 (north) - 35%
- A4010 (south) - 43%
- B4009 (south-west) - 18%
- A4129 (west) - 4%

5.3 Transport Mitigation Packages

A transport mitigation package has been developed to accompany each of the land use development in each scenario (see Appendix F). Each transport package

comprises 'soft' measures to encourage mode shift away from private car travel to public transport and non-motorised modes, and 'hard' measures including highway, walking and cycling infrastructure improvements. The package is proportional to the scale of the development; however no assessment of viability has been undertaken as part of this study. WDC are progressing a separate phase of work to assess broad viability aspects.

Scenarios B and C include the provision of a new route including possible new roads serving the land use development in addition to upgraded sections of existing road. For the purposes of this report, this route is referred to as the Western Relief Road (WRR).

There are considered to be a number of possible alignments for the new route that could serve the new land use development and provide a relief road for Princes Risborough, relieving the A4010. This assessment considers one possible concept alignment only in order to represent the strategic impacts of a possible new road to the west of the town. Other alignments would serve the same traffic function as the route considered in this report. Other studies prepared as part of the WDLP consider the scheme cost and environmental impacts of alternative WRR alignments.

These transport packages have been established for the purposes of the WDLP assessment only. The assessment is a tool to assist in the development of the plan and not related to any specific planning application. The packages and their component schemes would require further consideration before being progressed towards implementation, equally it may emerge that other schemes are more appropriate.

The key elements of the three packages are described further below.

5.3.1 Scenario A - 400 homes

This scenario assumes a package of local measures focused on improving the accessibility of the site, its connectivity with the wider Princes Risborough area, and minimising any adverse highway impact.

The access point to the new land use would be via Longwick Road, north of the railway line. Additional pedestrian access points would be provided via an upgraded crossing over the railway line to Aylesbury with a further connection underneath the existing railway bridge toward Summerleys Road. An improved pedestrian route and crossing facilities would be provided on Longwick Road.

The land use development would be served by improved local urban bus services, linking with key destinations within the town including the railway station and the town centre.

5.3.2 Scenario B - 1000 homes

This scenario would include the measures described in the 400 homes package, but with a range of additional schemes as indicated in Appendix F.

A new highway route serving the new areas of land use would be provided which would connect with Summerleys Road at a new junction in between the Birmingham and Aylesbury railway lines. This route would then continue via Summerleys Road, with a diversion which would re-join Picts Lane south of Station Road. Picts Lane,

Shootacre Lane and adjacent junction would be upgraded to facilitate increase levels of traffic movement along this route.

The package also includes upgrade to the Thame Road / Lower Icknield Way / Longwick Road roundabout. Also included is an extended local bus service and expanded urban realm improvements within the town centre area that would also serve to discourage additional traffic volumes in this area. Finally, an additional upgraded crossing of the railway line to Aylesbury is assumed, between Longwick Road and Mill Lane.

5.3.3 Scenario C - 2500 homes

This scenario would include the measures described in the 400 and 1000 homes package as indicated in Appendix F.

The new highway route would be extended to the north across Longwick Road to a new junction with Mill Lane / Lower Icknield Way. The route would continue to the north via an upgraded junction at the A4010 / Grove Lane which is assumed to include the replacement of the railway bridge at this location.

The package also includes upgrade to the Lower Icknield Way / Summerleys Road roundabout. Also included in addition to the local bus service is the provision of additional inter-urban bus services, with some routed along the potential WRR. Services would also continue along the existing A4010.

Urban realm improvements and further traffic calming would be delivered to reduce traffic growth in sensitive areas of the existing road network and also reduce the potential for rat running. Finally, the railway bridge at Mill Lane would be upgraded to support walking and cycling along this link.

5.4 Development Management

The transport packages and assumptions described in this section have been established for the purposes of the WDLP modelling assessment only.

As per the policies in the adopted Core Strategy and the DSA, the planning and highway authorities set out their expectations of the development management process (see section 2.2.2). Any land use development would need to be accompanied by the necessary infrastructure, including solutions that deliver sustainable modes and minimise congestion. The measures set out in the three packages may form part of the solution to resolving transport issues associated with these land use development sites but this should not be considered an exhaustive list. Other or different measures may be identified as appropriate at a later stage.

Consistent with national and local transport policy, each of the transport packages would include a number of sustainable transport measures to discourage single occupancy private car travel.

Policy DM2 in the DSA sets out a range of measures that new land use developments would be expected to provide. These are set out in Table 5-D.

ID	Transport Requirements	Wider evidence
a)	Public Transport - Access to a high quality, fully accessible, attractive public transport service.	Smart-ticketing has been shown to increase public transport patronage by 6 – 20% (Booz & Co, 2009)
b)	A new or enhanced Public Transport service where development is not already served by a high quality attractive train or bus service. This may be provided directly or by way of a financial contribution, so that the service is maintained for a period of at least five years from an agreed occupation level.	Targeted public transport marketing and infrastructure improvements on Route 9 in Aylesbury increased patronage by 28% after 2 months and 42% after 8 months (DfT, 2005)
c)	Walking and Cycling - Routes for pedestrians and cyclists which are designed to be safe, direct, attractive and convenient, according to the principles of community safety including that of natural surveillance from the built development;	In Aylesbury, Way-finding / branded signage increases cycle mode share from 3% in 2005 to 11% in 2007 (CILT, 2011)
d)	Travel Plans , in line with BCC guidance on Travel Plans, that set out the long term travel management strategy for an organisation or site, built on an appropriate package of measures aimed at promoting sustainable travel. They should include modal share targets and mitigation measures as well as the measures outlined below.	According to the DfT, workplace and school travel planning can reduce car trips by 18% and 10% respectively. Targeted marketing campaigns have been shown to reduce car trips by 8% (Moser and Bamberg, 2008).
e)	Car clubs - infrastructure in the form of parking spaces, drop off and pick up points, and, where appropriate car club vehicles, and/or subsidised cost of car club membership, and facilities for electric vehicle car charging points	Bucks Carshare is a car sharing website with around 600,000 members and is part of the Liftshare network. Founded in 1997 it is the UK's largest and most successful car-sharing network.
f)	Car Sharing - Priority parking spaces for car sharers at developments that are primarily destinations (i.e. non-residential uses)	

Table 5-D Policy DM2 Transport Requirements and wider evidence

6.1 Introduction

This section presents the results of the assessment of the WDLP land use development and transport mitigation scenarios described in section 5. The impact of each scenario is assessed using the same approach and criteria as for the 2013 base and 2031 Do Minimum scenarios described in sections 3 and 4. For the purposes of this report, the WDLP scenarios are referred to as ‘Do Something’ scenarios.

The impact of the scenarios is assessed against an appraisal framework, which includes a qualitative description of overall network performance, journey time impacts, traffic volume changes and consideration of the potential for travel by public transport and non-motorised modes.

6.2 Modelling Results - Do Something Scenarios

The assessment results for the three land use scenarios (A, B and C) are set out in this section. There are two sets of results presented for scenario C, with C1 assuming no wider traffic redistribution effect as a result of the implementation of the WRR and scenario C2 assuming redistribution as set out in section 5. It is assumed that there would only be the potential for significant traffic redistribution if a new / upgraded WRR is provided in full. No redistribution is assumed as part of scenarios A or B.

The assessment serves to provide an indication of the overall order of impact on various links and junctions within the study area. The results are dependent upon the various assumptions in this report including trip generation, trip distribution, and traffic growth. Alternative assumptions could result in a lesser or greater traffic impact on individual links and junctions. This would be considered in more detailed work should these land use or transport mitigation options be considered further.

No assessment of the potential for induced traffic demand has been undertaken at this stage. Induced demand would result in additional traffic volumes within the area as a result of the provision of additional road network capacity. Induced demand would potentially reduce the benefits of any major new highway schemes. The assessment compares traffic volume, RFC and delay for each Do Something scenario with the Do Minimum scenario.

Appendix G presents the traffic forecast volumes and link RFC’s for each scenario in more detail, consistent with the information presented in earlier sections of this report.

(a) Scenario A - 400 homes

Table 6-A presents the key changes in traffic volumes and road link RFC’s for the 2031 Do Something (400 homes) scenario compared with the 2031 Do Minimum scenario. The assessment assumes the new land use development adds a total of 200 trips in the AM peak and 230 trips in the PM peak.

For each traffic volume and link RFC table, the difference in link RFC is represented as follows:

- green shading where link RFC reduces
- amber shading where link RFC increases between 0.00 and 0.05
- red shading where the link RFC increase is greater than 0.05

Link RFC's are shown in amber where the value is between 0.85 and 1.00, and in red where the value exceeds 1.00.

No.	Link Location	AM Peak				PM Peak			
		Traffic Volume	Bound	Link RFC	Diff. Link RFC*	Traffic Volume	Bound	Link RFC	Diff. Link RFC*
1	A4010 New Road	1063	SE	0.96	+0.05	1411	NW	1.27	+0.05
2	A4010 Bell Street	1083	SW	0.98	+0.05	1376	NE	1.24	+0.05
3	A4010 Station Road	655	SW	0.45	+0.02	777	NE	0.53	+0.02
4	Grove Lane	497	SW	0.49	0	605	NE	0.59	0
5	Lower Icknield Way (south)	453	SW	0.50	+0.02	462	NE	0.51	+0.02
6	Longwick Road (east)	714	SE	0.57	+0.08	603	NW	0.48	+0.08
7	Summerleys Road (Station)	247	SE	0.27	0	447	NW	0.50	0
8	Shootacre Lane	66	SE	0.07	0	85	NW	0.08	0

Table 6-A 2031 - changes in traffic volume and link RFC – Scenario A - 400 homes

*Note 1: Difference in link RFC compared with the 2031 Do Minimum scenario

This scenario would result in a modest impact on link capacities within the study area with the most significant increase in link RFC of +0.05 on the A4010 New Road and Bell Street resulting from additional traffic volumes along these links of around 50 vehicles in the AM and PM peaks in each direction. This is one of most sensitive areas of road network within Princes Risborough given these links are forecast to operate over capacity in the 2031 Do Minimum scenario before any additional land use development is considered.

All other road links considered in this assessment are forecast to operate within capacity, with a maximum increase in RFC of +0.08 at Longwick Road.

Table 6-B presents the junction RFC's and delays for the 2031 Do Something (400 homes) scenario compared with the 2031 Do Minimum scenario.

For each junction RFC and delay table, the level of max delay and delay difference (min / veh) is shown as '<0.2' where maximum delays are relatively low and '>10.0' where maximum delays are relatively high.

The junction of New Road / Longwick Road / Aylesbury Road would continue to exceed capacity. Delays on the Longwick Road arm of the junction would increase by over 2 minutes in the AM peak and delays would exceed 10 minutes in the PM peak on the Tesco arm. For Grove Lane, delays would increase by over a minute per vehicle in each peak and exceed 10 minutes in total in the PM peak.

No.	Junction Location	AM Peak			PM Peak		
		RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)	RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)
1	A4010 / Mill Lane	0.20	0.3	<0.2	0.13	0.3	<0.2
2	A4010 / Station Rd	0.81	0.4	<0.2	0.56	0.3	<0.2
3	Station Rd/ Picts Lane	0.23	<0.2	<0.2	0.18	<0.2	<0.2
4	A4010 / Grove Lane	1.33	3.1	1.0	1.65	>10.0	1.6
5	Summerleys Rd / Lower Icknield Way	0.32	0.2	<0.2	0.88	0.5	<0.2
6	Shootacre Lane / Wycombe Rd	0.21	0.2	<0.2	0.31	0.3	<0.2
7	A4010 New Road / Bell Street	0.89	0.2	<0.2	0.77	<0.2	<0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	1.18	3.4	2.2	1.86	18.6	14.2
9	A4010 / Cadsdean Rd	0.74	0.2	<0.2	0.81	0.2	<0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	0.88	0.3	<0.2	0.54	<0.2	<0.2

Table 6-B 2031 - AM and PM peak junction RFC and delay – Scenario A - 400 homes

*Note 1: Difference in delay (min / veh) compared with the 2031 Do Minimum scenario

The impact of the new land use development at other junctions is considered to be negligible in both peak hours and other junctions continue to operate at or within capacity.

(b) Scenario B - 1000 homes

Table 6-C presents the key changes in traffic volumes and road link RFC's for the 2031 Do Something (1000 homes) scenario compared with the 2031 Do Minimum scenario. The assessment assumes the new land use development adds a total of 447 trips in the AM peak and 540 trips in the PM peak.

No.	Link Location	AM Peak				PM Peak			
		Traffic Volume	Bound	Link RFC	Diff. Link RFC*	Traffic Volume	Bound	Link RFC	Diff. Link RFC*
1	A4010 New Road	1035	SE	0.93	+0.02	1383	NW	1.25	+0.03
2	A4010 Bell Street	1055	SW	0.95	+0.02	1348	NE	1.21	+0.02
3	A4010 Station Road	673	SW	0.46	+0.03	815	NE	0.55	+0.04
4	Grove Lane	497	SW	0.49	0	605	NE	0.59	0
5	Lower Icknield Way (south)	463	SW	0.51	+0.03	473	NE	0.53	+0.04
6	Longwick Road (east)	658	SE	0.52	+0.03	547	NW	0.43	+0.03
7	Summerleys Road (Station)	256	SE	0.28	+0.01	462	NW	0.51	+0.01
8	Shootacre Lane	178	SE	0.17	+0.10	201	NW	0.20	+0.12

Table 6-C 2031 - changes in traffic volume and link RFC – Scenario B - 1000 homes

*Note 1: Difference in link RFC compared with the 2031 Do Minimum scenario

This scenario would result in a modest impact on link capacities within the study area. The greatest proportional impact is on Shootacre Lane as a result of the provision of new transport infrastructure which facilitates the routing of traffic to the south via Summerleys Road and Picts Lane toward the A4010 (south). This route accommodates low volumes of traffic in the Do Minimum scenario; therefore an increase in RFC of 0.10 and 0.12 would not be expected to have a material impact on the performance of the link.

The impact on the A4010 New Road and Bell Street is limited to an increase in RFC of 0.03; however, these links are forecast to operate over capacity in the 2031 Do Minimum scenario and any further increase would exacerbate existing congestion issues. All other road links considered in this assessment are forecast to operate within capacity, with a maximum increase in RFC of +0.04.

Table 6-D presents the junction RFC's and delays for the 2031 Do Something (1000 homes) scenario compared with the 2031 Do Minimum scenario.

No.	Junction Location	AM Peak			PM Peak		
		RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)	RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)
1	A4010 / Mill Lane	0.33	0.3	<0.2	0.23	0.3	<0.2
2	A4010 / Station Rd	0.76	0.3	<0.2	0.54	0.3	<0.2
3	Station Rd/ Picts Lane	0.23	<0.2	<0.2	0.18	<0.2	<0.2
4	A4010 / Grove Lane	1.56	5.5	3.4	1.83	>10.0	3.4
5	Summerleys Rd / Lower Icknield Way	n/a	n/a	n/a	n/a	n/a	n/a
6	Shootacre Lane / Wycombe Rd	n/a	n/a	n/a	n/a	n/a	n/a
7	A4010 New Road / Bell Street	0.87	0.2	<0.2	0.75	<0.2	<0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	1.11	2.1	0.9	1.66	9.8	5.3
9	A4010 / Cadsdean Rd	0.84	0.2	<0.2	0.85	0.3	<0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	0.90	0.3	<0.2	0.55	<0.2	<0.2

Table 6-D 2031 - AM and PM peak junction RFC and delay – Scenario B - 1000 homes

**Note 1: Difference in delay (min / veh) compared with the 2031 Do Minimum scenario*

The junctions of Shootacre Lane / Wycombe Road and Summerleys Road / Lower Icknield Way would be subject to a junction improvement scheme which would be designed to provide an appropriate level of capacity as part of the mitigation package for this scenario. The form and layout of these junctions would be subject to detailed work should this scenario be considered further.

The junction of New Road / Longwick Road / Aylesbury Road would continue to exceed capacity; however the performance of the junction improves in this scenario in comparison to scenario A (400 homes). This is a result of the new road infrastructure which provides access to the new land use development areas to and from the A4010 south. However, the existing A4010 junctions at New Road / Longwick Road / Aylesbury Road would continue to experience higher levels of traffic volume and delay in comparison to the Do Minimum scenario with further increases in delay of 1 minute and 5 minutes in the AM and PM peaks respectively.

The junction of A4010 / Grove Lane would continue to exceed capacity with delays increasing by over 3 minutes per vehicle in each peak and would continue to exceed 10 minutes in the PM peak. The level of delay would increase relative to Scenario A.

The A4010 / Cadsdean Road would operate just within or at capacity in both peak hours; however the level of associated delay at this junction would not increase materially in this scenario. The impact at other junctions is negligible in both peak hours and other junctions continue to operate at or within capacity.

(c) Scenario C1 - 2500 homes (without traffic redistribution)

Table 6-E presents the key changes in traffic volumes and road link RFC's for the 2031 Do Something (2500 homes) scenario compared with the 2031 Do Minimum scenario. The assessment assumes the new land use development adds a total of 1117 trips to the AM peak and 1351 trips to the PM peak.

No.	Link Location	AM Peak				PM Peak			
		Traffic Volume	Bound	Link RFC	Diff. Link RFC*	Traffic Volume	Bound	Link RFC	Diff. Link RFC*
1	A4010 New Road	1014	NW	0.91	0	1354	NW	1.22	0
2	A4010 Bell Street	1027	SW	0.93	0	1319	NE	1.19	0
3	A4010 Station Road	630	SW	0.43	0	743	NE	0.51	0
4	Grove Lane	691	NE	0.68	+0.19	786	NE	0.77	+0.18
5	Lower Icknield Way (south)	547	SW	0.61	+0.13	567	NE	0.63	+0.14
6	Longwick Road (east)	612	SE	0.49	0	499	NW	0.40	0
7	Summerleys Road (Station)	258	SE	0.29	+0.02	466	NW	0.52	+0.02
8	Shootacre Lane	416	SE	0.41	+0.34	446	NW	0.44	+0.36

Table 6-E 2031 - changes in traffic volume and link RFC – Scenario C - 2500 homes

**Note 1: Difference in link RFC compared with the 2031 Do Minimum scenario*

This scenario would result in some notable impacts on link capacities within the study area. The greatest proportional impact is on Shootacre Lane with two-way volume increases of 594 and 729 in the AM and PM peaks respectively. These increases are associated with the re-routing impacts of the mitigation package. However, the link would continue to operate within capacity. Other significant increases are shown on Grove Lane and Lower Icknield Way, however these links would also continue to operate within capacity.

The mitigation package including the southern section of the WRR limits the growth of traffic and delay on the A4010, and a negligible impact is forecast on this existing route. Consistent with the Do Minimum scenario, the A4010 remains over capacity in the PM peak. All other road links are forecast to operate within capacity.

Table 6-F presents the junction RFC's and delays for the 2031 Do Something (2500 homes) scenario compared with the 2031 Do Minimum scenario.

No.	Junction Location	AM Peak			PM Peak		
		RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)	RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)
1	A4010 / Mill Lane	0.19	0.3	<0.2	0.12	0.3	<0.2
2	A4010 / Station Rd	0.72	0.3	<0.2	0.52	0.2	<0.2
3	Station Rd/ Picts Lane	0.23	<0.2	<0.2	0.18	<0.2	<0.2
4	A4010 / Grove Lane	n/a	n/a	n/a	n/a	n/a	n/a
5	Summerleys Rd / Lower Icknield Way	n/a	n/a	n/a	n/a	n/a	n/a
6	Shootacre Lane / Wycombe Rd	n/a	n/a	n/a	n/a	n/a	n/a
7	A4010 New Road / Bell Street	0.86	0.2	<0.2	0.73	<0.2	<0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	1.07	1.2	<0.2	1.28	4.5	<0.2
9	A4010 / Cadsdean Rd	0.73	0.2	<0.2	0.78	0.2	<0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	n/a	n/a	n/a	n/a	n/a	n/a

Table 6-F 2031 - AM and PM peak junction RFC and delay – Scenario C - 2500 homes

*Note 1: Difference in delay (min / veh) compared with the 2031 Do Minimum scenario

Four key junctions would be subject to improvements as part of a transport mitigation package for this scenario. The form and layout of these junctions would need to be subject to detailed work should this scenario be considered further.

In terms of impacts on the wider road network, the mitigation package including a full WRR is forecast to limit impacts on existing junctions as traffic movements associated with the new land use development areas are able to utilise new route which avoid the need to use the A4010.

The junction of New Road / Longwick Road / Aylesbury Road would remain over capacity with delays at the level forecast for the Do Minimum; over 1 minute in the AM peak and over 4 minutes in the PM peak.

(d) Scenario C2 - 2500 homes (with traffic redistribution)

Table 6-G presents the key changes in traffic volumes and road link RFC’s for the 2031 Do Something (2500 homes - redistribution) scenario compared with the 2031 Do Minimum scenario.

This scenario assumes a proportion of through-traffic would redistribute to utilise the new WRR rather than continue on the existing route (see section 5).

The mitigation package provides the potential to redistribute traffic away from the congested A4010 route than the town centre. With a proportion of long distance through-trips diverted to the WRR, link RFC’s at New Road and Bell Street are reduced by up to 0.16, resulting in improved conditions relative to the Do Minimum scenario. These links would operate within capacity in the AM peak and close to capacity in the PM peak.

No.	Link Location	AM Peak				PM Peak			
		Traffic Volume	Bound	Link RFC	Diff. Link RFC*	Traffic Volume	Bound	Link RFC	Diff. Link RFC*
1	A4010 New Road	947	NW	0.85	-0.06	1181	NW	1.06	-0.16
2	A4010 Bell Street	911	SW	0.82	-0.11	1146	NE	1.03	-0.16
3	A4010 Station Road	513	SW	0.43	0	570	NE	0.51	0
4	Grove Lane	758	NE	0.74	+0.25	959	NE	0.94	+0.35
5	Lower Icknield Way (south)	547	SW	0.61	+0.13	567	NE	0.63	+0.14
6	Longwick Road (east)	612	SE	0.49	0.00	499	NW	0.40	0.00
7	Summerleys Road (Station)	258	SE	0.29	+0.02	466	NW	0.52	+0.02
8	Shootacre Lane	532	SE	0.52	+0.45	619	NW	0.61	+0.53

Table 6-G 2031 - changes in traffic volume and link RFC – Scenario C - 2500 homes (redistributed)

*Note 1: Difference in link RFC compared with the 2031 Do Minimum scenario

Significant increases in link RFC occur in the areas to which traffic is assumed to divert including Grove Lane, Lower Icknield Way and Shootacre Lane. These links would continue to operate within capacity, although the Grove Lane link would be approaching capacity in the PM peak in this scenario.

Table 6-H presents the junction RFC's and delays for the 2031 Do Something (2500 homes - redistribution) scenario compared with the 2031 Do Minimum scenario.

No.	Junction Location	AM Peak			PM Peak		
		RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)	RFC	Max Delay (min/veh)	Delay Diff.* (min/veh)
1	A4010 / Mill Lane	0.16	0.2	<-0.2	0.10	0.2	<-0.2
2	A4010 / Station Rd	0.59	0.2	<-0.2	0.43	0.2	<-0.2
3	Station Rd/ Picts Lane	0.23	<0.2	<0.2	0.18	<0.2	<0.2
4	A4010 / Grove Lane	n/a	n/a	n/a	n/a	n/a	n/a
5	Summerleys Rd / Lower Icknield Way	n/a	n/a	n/a	n/a	n/a	n/a
6	Shootacre Lane / Wycombe Rd	n/a	n/a	n/a	n/a	n/a	n/a
7	A4010 New Road / Bell Street	0.80	0.2	<-0.2	0.64	<0.2	<-0.2
8	A4010 New Road / Longwick Road / Aylesbury Rd	0.93	0.9	-0.3	1.06	0.6	-3.9
9	A4010 / Cadsdean Rd	0.66	<0.2	<-0.2	0.63	<0.2	<-0.2
10	Thame Rd / Lower Icknield Way / Longwick Rd	n/a	n/a	n/a	n/a	n/a	n/a

Table 6-H 2031 - AM and PM peak junction RFC and delay – Scenario C - 2500 homes (redistributed)

*Note 1: Difference in delay (min / veh) compared with the 2031 Do Minimum scenario

The scenario shows a beneficial impact on junction performance at all junctions on the route. The most significant benefit is forecast at the New Road / Longwick Road / Aylesbury Road junction with a reduction in the level of delay of almost 4 minutes in the PM peak compared to the Do Minimum scenario. As longer distance through trips find a balance based on journey time and distance in terms of route selection between the existing A4010 and the WRR, some would divert, contributing to this effect.

6.3 Scenario Appraisal

Table 6-1 summarises the impacts of the three land use and transport infrastructure scenarios. The appraisal of impacts is limited to traffic and transport system performance categories including overall network performance, journey time and delay, traffic volumes and rat running, public transport and non-motorised users only. The appraisal is intended to inform strategy development and emerging development principles.

This assessment represents an early stage in the WDLP development process. Further studies would be required, to consider how to combine the effective elements of the transport mitigation packages to improve overall network performance and produce optimal travel conditions, as they are developed further. This would include deliverability, wider transport impacts and non-transport effects (including environmental and social factors).

Category	2031 Do Something (A – 400 homes)	2031 Do Something (B – 1000 homes)	2031 Do Something (C1/C2 – 2500 homes)
Positive			
Network Performance – Link Capacity	- Overall modest impact on link capacities	- Overall modest impact on link capacities	- Potential to improve performance of A4010 New Road and Bell Street links
Junction Delay	- Scope of impact limited to two key junctions	- Scope of impact limited to two key junctions	- Potential to improve performance of New Rd / Longwick Rd / Aylesbury Rd junction
Traffic Volumes / Rat Running	- Relatively low overall traffic generation	- Southern section of WRR allows traffic diversion away from congested parts of the network	- WRR allows traffic diversion away from congested parts of the network
Public Transport	- Potential for improvement / provision of new local bus services	- Potential for improvement / provision of new local bus services	- Potential for new dedicated local bus services and improvements to inter-urban services
Non-motorised Users	- Pedestrian routes across the rail lines would be improved	- Pedestrian routes across the rail lines would be improved - Potential for improved urban realm in town centre	- Pedestrian routes across the rail lines would be improved - Potential for improved urban realm in town centre
Negative			
Network Performance – Link Capacity	- Notable increase in link RFC at Longwick Rd - A4010 New Road and Bell Street remain over capacity	- Notable increase in link RFC at Shootacre Lane - A4010 New Road and Bell Street remain over capacity	- Notable increase in link RFC at Grove Lane / Lower Icknield Way and Shootacre Lane - A4010 New Road and Bell Street remain over capacity
Junction Delay	- Grove Lane and New Rd / Longwick Rd / Aylesbury Rd junctions significantly over capacity	- Grove Lane and New Rd / Longwick Rd / Aylesbury Rd junctions significantly over capacity	- New Rd / Longwick Rd / Aylesbury Rd junctions remains over capacity
Traffic Volumes / Rat Running	- Increase in traffic volume on already congested A4010 links - Significant potential for rat running caused by over-capacity junctions	- Increase in traffic volume on already congested A4010 links - Significant potential for rat running caused by over-capacity junctions	- Relatively high overall traffic generation - Traffic redistribution impact on residential streets including Summerleys Rd.
Public Transport	- Land use development is not in the immediate vicinity of existing inter-urban bus services	- Land use development is not in the immediate vicinity of existing inter-urban bus services	
Non-motorised Users			- Much of the site would not be in close proximity to the town centre

Table 6-1 Summary appraisal table

6.4 Summary

This section describes the results of the assessment of land use development scenarios in the Princes Risborough area. Three scenarios are considered for 400 homes (A), 1000 homes (B) and 2500 homes (C1/C2). Each scenario is associated with a wider transport mitigation package, informed by a review of Do Minimum transport conditions and developed for the purposes of this assessment. Scenario B includes the southern section of a possible WRR for Princes Risborough. Scenarios C1 and C2 include a full WRR. These theoretical scenarios have been developed for the purposes of the WDLP transport study only.

The assessment sets out impacts in terms of changes in traffic volume, link RFC's, junction RFC's and delays.

Overall, the impact of scenario A is modest but adverse, with some impact on already congested junctions in particular at the New Road / Longwick Road / Aylesbury Road roundabout. The impacts of the development are spread broadly across the existing road network

The impact of scenario B is also generally modest but adverse, with greater impacts in the north of the area. The performance of the junction of Grove Lane / A4010 is further degraded in this scenario and significant levels of delay are forecast. Some of the impact on the existing A4010 through the town centre could be mitigated as a result of traffic re-routing to the southern section of a possible WRR and performance would be improved relative to Scenario A. However, the diversion of traffic as a result of the new road infrastructure would result in greater impacts on the route via Shootacre Lane.

Scenario C has the potential to mitigate its impacts to a great extent and also provide some positive benefits for Princes Risborough town centre and the A4010 as a result of the provision of a mitigation package which includes a WRR. This would depend upon the volume of traffic that would redistribute to this new route (and therefore, the design of that route). Adverse impact would be experienced on routes used to access a new WRR including Grove Lane, Lower Icknield Way, Summerleys Road and Shootacre Lane.

Further more detailed assessment work would be undertaken if these land use development scenarios and schemes are considered further. This would include detailed modelling and a review of the potential for suppressed or induced demand in the area.

7 Summary and Conclusion

7.1 Overall Summary

Wycombe District Council (WDC) is developing a new Local Plan for the District. Once adopted, the Plan (WDLP) will replace the adopted Core Strategy (2008) as well as the saved policies from the existing Local Plan (2004). The WDLP will sit alongside the Delivery and Site Allocations (DSA) Plan for Town Centres and Managing Development document.

Jacobs has been commissioned by Buckinghamshire County Council (BCC) and WDC to undertake a transport study. The study provides an evidence base informed by a traffic assessment which demonstrates the implications of potential new land use development and potential associated transport infrastructure schemes. The evidence base will support and inform the development of the new WDLP.

The Princes Risborough area is characterised by relatively high levels of vehicle ownership. Travel to work mode shares are dominated by private car travel. Princes Risborough lies on the A4010 which is the primary north-south route between Aylesbury and High Wycombe and access to the strategic road network is typically via Junction 4 (High Wycombe) and Junction 6 (Lewknor) of the M40.

The pattern of traffic movements is influenced by the A4010 which results in relatively high proportions of through trips within this area. A limited network of local public transport routes is present and the primary public transport provision is via longer distance routes between Aylesbury and High Wycombe.

The most significant levels of congestion and delay in Princes Risborough in the 2013 base year are focused on two key areas. First, the town centre links and junctions in the vicinity of New Road and Bell Street experience peak time delay. The Grove Lane arm of the A4010 near Little Kimble is also constrained by the volume of traffic on the A4010 and this results in vehicular delays. However, significant congestion is typically limited to these areas and a proportion of the peak hour only.

A 'Do Minimum' network assessment model scenario has been developed which includes traffic growth assumptions consistent with NTEM. This scenario shows that traffic volumes are forecast to increase by around 20% by 2031 with consequential impacts on link and junction delays. Traffic growth exacerbates issues in the vicinity of the A4010 New Road, Bell Street and on Grove Road. The Do Minimum scenario provides a reference against which three 'Do Something' land use and transport mitigation packages are considered.

The Scenarios consider a total of (A) 400, (B) 1000 and (C) 2500 homes to the west of the Princes Risborough urban area. Scenario B includes the southern section of a possible Western Relief Road (WRR) for Princes Risborough. Scenarios C1 and C2 include a full WRR.

The assessment sets out impacts in terms of changes in traffic volume, link RFC's, junction RFC's and delays. Overall, the impact of scenario A is modest but adverse, with some impact on already congested junctions in particular at the New Road / Longwick Road / Aylesbury Road roundabout.

The impact of scenario B is similarly modest but adverse, with greater impacts on the route via Shootacre Lane but a reduced level of impact on the A4010 and Princes Risborough town centre. The performance of the junction of Grove Lane / A4010 is further degraded in this scenario.

Scenario C has the potential to mitigate its impacts to a greater extent and also deliver some positive benefits for Princes Risborough town centre and the A4010 as a result of the provision of a mitigation package which includes a WRR. The level of benefit would depend upon the volume of traffic that would redistribute to this new route. A corresponding adverse impact would be experienced on routes used to access a new WRR including Grove Lane, Lower Icknield Way, Summerleys Road and Shootacre Lane.

7.2 Conclusion

This transport study has set out the strategic impacts of new land use development in the Princes Risborough area. A set of transport mitigation packages has been developed as part of the study which includes more significant schemes for the higher quantum of land use development.

Traffic conditions in terms of link speeds, journey times and delays are forecast to worsen overall and these packages do not fully return network performance to Do Minimum or base year levels. Each scenario adds additional traffic to the road network and scenarios A and B demonstrate a modest but adverse impact on traffic conditions.

However, as well as contributing to mitigating the impacts of land use development, the WRR strategic infrastructure scheme introduced as part of Scenario C provides some significant benefits for vehicular traffic as part of a wider sustainable package and has the potential to improve conditions on the A4010 in the town centre.

Consideration of how to minimise the forecast growth in traffic would be important as the 'Do Minimum' traffic growth is the most important factor influencing link congestion and junction delays. Furthermore, there is some evidence¹⁸ and opinion that suggests that the levels of traffic growth forecast by the various industry-standard databases would not materialise in future, and therefore transport conditions would be significantly better than set out in this report.

This assessment represents an early stage in the WDLP development process and should these scenarios be considered further, additional studies may consider revised scales of land use quantum and different combinations or revisions to mitigation packages to produce optimal transport conditions. This process would be informed by public and stakeholder feedback on the initial studies.

¹⁸ Peak car use in Britain <http://www.parliament.uk/documents/commons-committees/transport/POST%20briefing%20on%20peak%20car.pdf>