Chapter 11 Traffic and transport

Introduction

11.1 WSP Development Ltd was commissioned by Countryside Properties to undertake the traffic and transport assessment for the EIA. The key issues that were examined included the provision of a perimeter road and the impact of the proposed mixed use development on the local highway network. Consideration was given to both construction and post-construction traffic and the impact on environmental factors such as pedestrian amenity, severance, safety and driver delay. Traffic and transport was scoped as an issue of primary significance for examination in the EIA.

11.2 WSP Development Ltd also produced a transport assessment (TA), and is included as a supporting document. The derivation of the data relied upon in the EIA transport assessment is set out in detail in the TA.

Legislation and policy

11.3 This section discusses the main transport policies from the Oxfordshire County Council Structure Plan, the Cherwell District Local Plan and the Oxfordshire County Council Local Transport Plan.

Oxfordshire Structure Plan - Draft Deposit 2016

11.4 The Oxfordshire Structure Plan (adopted October 2005) sets out the framework for the development of Oxfordshire until 2016. The key transport policies are set out below.

11.5 Policy G1 emphasises that new development should be concentrated in locations where a reasonable range of services and community facilities can be provided and where the need to travel, particularly by car, can be reduced. Locations that encourage walking, cycling and the use of public transport are encouraged.

11.6 The focus for transport is to improve the quality of life in Oxfordshire by improving the range of travel options available. Policy T6 advocates the need to promote and manage principal transport hubs, corridors and projects. The Oxford to Bicester corridor is identified as a strategic route that is key to both strategic and local movement requirements. The potential opportunity for a remote park and ride scheme to operate on this principal transport corridor is identified.

11.7 In order to promote more sustainable travel choices, policy T2 advises that car parking should be restrained and accompanied by complementary measures to provide good alternative choices for means of access. However, it is acknowledged that car parking provision will depend on a range of issues including the type of development and ease of access to services by other modes.

11.8 With regard to sustainable travel, policy T1 places emphasis on meeting the needs of pedestrians, cyclists and public transport, whilst balancing the demand for road space to ensure the ease of traffic movement. Objectives for securing a convenient, reliable and high

quality public transport network are set out in policy T3, whilst those for safe and desired pedestrian and cycle networks are identified in policy T5.

Cherwell District Local Plan

Adopted Cherwell District Local Plan (2004)

11.9 Cherwell District Local Plan (CDLP), adopted in November 1996, sets out Cherwell District Council's (Cherwell District Council) vision for development in the district. Transport policies within the CDLP highlight the increasing level of car ownership in the area and the need to place greater emphasis on the role of public transport. Policy TR1 requires that the council to be '*satisfied that new highways, highway-improvement works, traffic management measures, additional public transport facilities or other transport measures that would be required as a consequence of allowing the development to proceed are provided'*. In addition, policy TR3 requires traffic impact assessments for all major development proposals.

Non-Statutory Cherwell District Local Plan (2011) (NSCLP)

11.10 Chapter 6 of the NSCLP sets out transport policies in relation to the development of local transport infrastructure in the district. Policy TR5 advocates that development should not compromise the safe movement and free flow of traffic, whilst policy TR6 seeks to facilitate the provision and operation of an effective public transport system as a genuine alternative to the use of private vehicles. This will include, where appropriate, giving priority to public transport over general traffic.

11.11 Other transport policies of relevance to the proposed development include policy TR11 regarding parking provision, policy TR19 for roads in residential areas, as well as policies TR26 and TR27 regarding highway schemes in Bicester.

11.12 The latter two policies are of particular importance for the proposed development in their detailing of the A41/A4095 link road and the associated roads from the A41 to Howes Lane / Middleton Stoney Road. The A41 / A4095 link road scheme is identified as a developer-funded scheme, for which land has been reserved within the Oxfordshire Local Transport Plan 2001-2006 and a provisional alignment identified in the NSCLP. Partnership working between the district and county council is advocated for the delivery of the above schemes, as they are '*required to serve development'*.

Oxfordshire County Council Local Transport Plan

11.13 The Local Transport Plan sets out the vision for transport in Oxfordshire in two phases. Local Transport Plan 2001-2006 (LTP1) identifies the vision for the first five-year period, whilst the provisional LTP2 identifies policies and transport schemes for the five-year period from 2006-2011.

11.14 The LTP1 strategy embraces both national and regional guidance. The main aims of LTP1 are to develop a county where:

- dependence on travel by private car is reduced by increasing the choices available to meet transport needs
- appropriate transport infrastructure and services are provided to support new development and a growing economy
- an increasing proportion of trips are made on foot, by bicycle and by public transport
- the number of casualties associated with travel is reduced
- access for people and goods is maintained or improved
- the quality of transport networks is safeguarded and enhanced by effective maintenance and enforcement of appropriate regulations
- noise, pollution, fear of accidents, and other nuisances associated with traffic are contained.

11.15 The LTP1 sets out a number of improvement measures and major schemes which are aimed at fulfilling the above objectives. These measures are considered for different modes of transport and different sectors of society.

11.16 Policies of relevance to the proposed development are set out in part 3, section 32 of the LTP1. Key objectives for Bicester are in line with the overarching strategy of the LTP1 and specifically look to:

- improve and enhance accessibility for all modes within Bicester and between Bicester and neighbouring villages
- improve the physical operation and integration between modes, particularly within new developments
- remove unwanted traffic from sensitive areas, reduce emissions and noise impacts and preserve and enhance the character of the town.

11.17 The LTP1 identifies high volumes of congestion on the A41 / A4421 corridors. Substantial problems in surrounding rural areas are recognised as a result of traffic diverting away from congested areas of highway. Planned measures to address congestion include the implementation of improvements to Skimmingdish Lane in order to reduce traffic flows on Buckingham Road.

11.18 The LTP2 states that addressing the congestion on the A41 is a high priority due to the strategic importance of the A41 linking Bicester to the M40. The LTP2 therefore classifies the A41 as a priority action area. In order to tackle the congestion problem, the LTP2 proposes to continue to work in partnership with other agencies to help mitigate congestion. Proposed action includes:

- working with the Highways Agency to begin increasing the capacity of junction 9 of M40
- introduce a premier bus route between Bicester and Oxford
- investigate the potential for a remote park and ride in Bicester
- ensure the East-West rail scheme is taken forward.

Methodology

11.19 The EIA traffic and transport assessment is derived from the TA undertaken by WSP Development Ltd for the proposed development at South West Bicester. The TA considers

in detail all the transport aspects associated with the proposed development and includes the highway improvement scheme that is being promoted by the Highways Agency at M40 junction 9.

11.20 The EIA sets out the key implications of the development on the local highway network and also examines environmental factors such as pedestrian amenity, severance, safety and driver delay.

11.21 The scope of the TA and the EIA traffic and transport assessment in terms of geographical extent of the study areas and assessment period addressed have been agreed with representatives of Oxfordshire County Council.

11.22 Baseline conditions have been considered and have provided the basis for assessing the net impact of the development proposals during the construction and operational phases. This has enabled a transport strategy to be brought forward to mitigate the impact of the development proposals. This strategy is set out in detail in the proposals chapter (chapter 3).

11.23 The survey work undertaken included manual classified peak hour turning counts carried out during July 2005 at the following highway junctions:

- A41 Oxford Road / Chesterton Road Slip Roads
- A41 Esso Roundabout
- A41 Tesco Roundabout
- Middleton Stoney Road / Shakespeare Drive Junction
- Middleton Stoney Road / Howes Lane Junction.

11.24 Automatic traffic counts (ATCs) were also undertaken in July 2005 along the following local highway links:

- Howes Lane (north of Middleton Stoney Road)
- A41 Oxford Road (south of Esso Roundabout)
- A41 Eastern Perimeter Road (east of Esso Roundabout).

11.25 In addition, a manual classified count was obtained from Oxfordshire County Council for the A4095 Middleton Stoney Road / King's End mini-roundabout. This survey was undertaken in September 2003. An NRTF low growth factor has been applied to these survey results in order to provide a consistent 2005 base year.

11.26 Personal injury accident data covering a five year period from 01 May 2000 to 30 April 2005 have been supplied by Oxfordshire County Council.

11.27 The future baseline environment has also been examined and this has involved consideration of the committed public transport, pedestrian and cycleway and highway schemes.

11.28 The data sources used are set out in figure 11.1.

Oxfordshire County Council, Oxfordshire Structure Plan - Draft Deposit 2016
Cherwell District Council, Adopted Cherwell District Local Plan (2004)
Cherwell District Council, Non-Statutory Cherwell District Local Plan (2011)
Oxfordshire County Council Local Transport Plan (2001-2011)
Institute of Environmental Management and Assessment (IEMA),Guidelines for the Environmental Assessment of Road Traffic (Guidance Note No. 1) 1993
WSP, South West Bicester Transport Assessment 2005
WSP Development Ltd, Technical Appendix 5 – Traffic and Transport, 2005
Halcrow Group Limited on behalf of Oxfordshire County Council, The Remote Park and Ride – Interim Report (February 2005)
Bicester Integrated Transport and Land Use Study (Bicester ITS), March 2000

Figure 11.1 Data sources and references

Impact assessment

Scope

11.29 The impact assessment has involved consideration of the construction and post-construction impacts. Three key phases have been considered during construction including the main phase of work, construction of the access junctions and the initial stage of construction with access from Middleton Stoney Road. The assessment has examined the numbers of construction traffic during this period and the required works to the local highway network. The main impacts will arise during the initial stage of construction and during construction of the access junctions. This work will be completed during the early stages of the construction period, in advance of large numbers of residential properties being occupied.

11.30 To assess the implications of the proposed development on the local highway network, the predicted traffic flows with and without the development have been derived for 2014. It is anticipated that by 2014 the full development of up to 1,585 residential units and associated development will be occupied and the proposed pedestrian, cycle and public transport strategies will have been implemented. Furthermore, all site access junctions, other new / improved junctions and the perimeter road will have been created.

11.31 The assessment has included the safeguarded health village site within the 'with development' predicted traffic flows. The health village will include a nursing home and could include a community hospital, GP surgery and complementary uses. An alternative scenario is for part of the land to revert to employment if the health village is not taken forward. Assessment work has demonstrated that land could be used for employment rather than healthcare uses without impacting on the predicted traffic levels generated. Therefore the transport assessment fully takes into account both scenarios.

11.32 It was considered that the largest impact on the local highway network would be in 2014, once development is complete and occupied. This impact would be greater than any periods of overlap between the construction phase and the occupation of completed dwellings. This is because the greatest impact during the construction work will be during the early stages when the junction works are being completed. Only a limited number of residential dwellings will be occupied during this period and cumulative and overlapping effects will not be an issue.

Assessment work

11.33 Detailed junction analyses have been undertaken to assess the implications of the new development on the six new permanent accesses. The performance of these has been assessed using the 2014 'with development' flows. These are:

- A41 access roundabout
- eastern site access junction
- north-eastern access junction
- northern site access junction
- north-western site access roundabout
- southern site access junction.

11.34 The performance of these junctions have been assessed using the Department for Transport's standard programs ARCADY, LINSIG and PICADY for roundabouts, signal junctions and priority junctions respectively.

11.35 A further two junctions will be constructed in order to complete the access strategy for the proposed development. These are:

- Chesterton Road / Perimeter Road Junction
- Howes Lane Roundabout.

11.36 These have been assessed using the Department for Transport's standard programs ARCADY and PICADY for roundabouts and priority junctions respectively.

11.37 The existing layout of the A41 Esso Roundabout has been assessed using the Department for Transport's standard program ARCADY for roundabouts to examine the impact of the development on this junction. In addition, the impact of the new perimeter road has been examined to identify any effects post-construction, as well as the impact of the post-construction traffic on the wider highway network.

11.38 In relation to the operation of the junctions assessed, the most sensitive period will be during the peak hours when there would be the greatest level of change and the absolute level of impact will be greatest. For construction, the main impact is likely to be driver delay during construction of the new A41 access junction. This would have the most significant effect during peak hours when traffic flows would be highest.

11.39 With respect to the perimeter road and wider highway network, the most significant effect is also likely to be during peak hours when traffic flows are highest. However, due to the nature of the sensitive receptors along these links there may also be an influence on the impacts assessed outside of the peak periods. An assessment of the daily traffic flows on the perimeter road and wider highway network has therefore been included.

11.40 The assessment of the new access junctions and the impact of the perimeter road have been considered with reference to the environmental factors set out in the Institute of Environmental Management and Assessment (IEMA), Guidelines for the Environmental Assessment of Road Traffic (Guidance Note No. 1). These set out the recommended list of

environmental impacts which could be considered as potentially significant whenever a new development is likely to give rise to changes in traffic flows. These impacts include the following issues.

- driver delay
- severance
- pedestrian delay and amenity
- accidents and safety
- hazardous loads
- dust and dirt.

Driver delay

11.41 There is potential for traffic delays to non-development traffic at the following locations:

- the site entrances where there will be additional turning movements
- on the highways passing the site where there may be additional flow
- key junctions on the nearby highway network.

11.42 Values for delay are based on computer junction assessment program; ARCADY for roundabouts, PICADY for priority junctions and LINSIG for signal junctions. Existing junction operation has been assessed. Where appropriate, comparisons are made between baseline conditions and the 'with development' scenario. Details of the peak hour capacity assessment results are provided within the TA.

Severance

11.43 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic route. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether crossing facilities are provided or not.

11.44 The IEMA Guidelines suggest that a 30%, 60% or 90% increase in traffic flow will respectively have a ‘slight’, ‘moderate’ or ‘substantial’ change in severance. However, allowance needs to be made for the presence of existing crossing facilities.

Pedestrian delay and amenity

11.45 The development will bring about increases in the number of vehicle movements and pedestrian movements. In general, increases in traffic levels are likely to lead to greater increases in delay to pedestrians seeking to cross roads. The IEMA Guidelines recommend that rather than relying on thresholds of pedestrian delay, the assessor should use judgement to determine whether there is a significant impact to pedestrian delay.

11.46 The guidelines broadly define pedestrian amenity as the relative pleasantness of a journey. It is affected by traffic flow, traffic composition, footway width and separation from traffic. A tentative threshold for changes in pedestrian amenity is where traffic flow is halved or doubled.

11.47 A further impact traffic may have on pedestrians is fear and intimidation. This impact is dependent on the volume of traffic, its HGV composition and its proximity to people or the lack of protection caused by factors such as narrow footway widths.

Accidents and safety

11.48 The personal injury accident (PIA) record for the local highway network has been obtained from Oxfordshire County Council. The impact of additional traffic from the development is discussed in terms of magnitude of increase, the existing accident record and the effect of off-site highway and transportation works.

Hazardous loads

11.49 The IEMA Guidelines acknowledge that most developments will not result in increases in the number of movements of hazardous / dangerous loads. The publication '*The Carriage of Dangerous Goods in the UK*' lists materials which can represent a hazard when in transit, and provides guidance in relation to the safe carriage of these goods.

11.50 Given the nature of the construction activities that will be employed during the build out of the site, and the proposed end users, it is not anticipated that either the construction or operational stages of the proposed development will require carriage of materials listed on '*The Carriage of Dangerous Goods in the UK*'. This issue is therefore not considered further.

Dust and dirt

11.51 Dust and dirt created by traffic can be a problem arising from the operations of certain types of development, notably quarrying and the transport of quarried materials. The impact of dust and dirt will depend on the management practices undertaken on site. The environmental impact of traffic on noise and air quality (including dust) is dealt with in chapters 9 and 12 of this ES respectively.

Assessment of sensitivity

Sensitivity or importance of receptor

11.52 The IEMA Guidelines set out that *'highway links should be assessed when traffic flows have increased by more than 30% or other sensitive areas are affected by traffic increases of at least 10%'*. These sensitive areas are defined by the presence of sensitive receptors, such as congested junctions, hospitals, community centres, conservation areas, schools, colleges or accident blackspots.

11.53 If a sensitive receptor is located sufficiently close to a link / junction, the impact must be assessed where traffic increases are greater than 10%. To determine the significance of the magnitude of traffic flows for a link / junction, the sensitivity of the receptors have been defined as set out on figure 11.2.

Magnitude of change

11.54 The magnitude of adverse impacts or benefits, including residual adverse impacts or benefits, has been assessed on the following basis:

- large – significant deterioration / improvement in local conditions or circumstances
- medium – readily apparent change in conditions or circumstances
- small – perceptible change in conditions or circumstances
- negligible – no discernible change in conditions or circumstances.

11.55 Further information on the magnitude of change to traffic flows and percentage of HGVs is included in figure 11.3.

Impact significance

11.56 The overall significance of an impact will be determined by measuring the magnitude of the impact or residual impact against the sensitivity and importance of the receptor. This process involves consideration of the type of receptor, the number and activities of the population affected, and the type of the impact / benefit. Paragraph 4.5 of the IEMA Guidelines states that:

> '*For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information where ever possible.*'

11.57 The scale used for the significance of impacts, including residual impacts, ranging from 'not significant' to 'very substantial', is defined by the significance matrix (figure 11.4). The determination of the overall significance is based upon the magnitude of impact and the sensitivity of the receptor under the judgement of the assessor, backed up by data or information wherever possible.

Baseline

Local highway network

11.58 The existing highway network in the vicinity of the site is shown on figure 11.5. Middleton Stoney Road is approximately 7m wide and runs along the northern boundary of the site. The road provides a link between Bicester and Middleton Stoney with further links to M40 junction 10 and Lower Heyford. The road is subject to 50 mph speed limit between Shakespeare Drive and King's End. Street lighting is provided along Middleton Stoney Road between Shakespeare Drive and its junction with King's End / Roman Road.

11.59 King's End lies to the north of Middleton Stoney Road. This 7m wide road provides a link between the A41 Oxford Road and Bicester town centre via Church Street and Queens Avenue. Shakespeare Drive and Howes Lane provide other routes to the north-western areas of Bicester from Middleton Stoney Road.

11.60 The A41 Oxford Road forms the north-eastern boundary of the site and is a dual carriageway road subject to the national speed limit. A mini roundabout provides access to Middleton Stoney Road and central Bicester, while a second roundabout to the south

enables access to Tesco and the Bicester Village Outlet Shopping Area. A third roundabout on the A41 Oxford Road gives access to the Esso petrol filling station. The eastern arm of this roundabout continues as the A41 and forms Bicester's eastern perimeter road.

11.61 To the south, the A41 Oxford Road provides strategic links with M40 junction 9 and the A34.

Existing traffic flows

11.62 Figures 11.6 and 11.7 show the 2005 base traffic flows on the local highway network for the morning and evening peak hours respectively. It should be noted that the flows are reported in passenger car units (PCUs) in order to reflect the heavy goods vehicle (HGV) content along each of the roads. Consequently, if the flow on the A41 is 1,500 cars and 100 HGVs, the flow in PCUs is approximately 1,700 PCUs (HGVs equate to two units, cars are one unit).

11.63 To the north of the site it can be seen that Middleton Stoney Road has a two way flow during the morning peak hour (0800 to 0900 hrs) of approximately 900 PCUs with approximately two thirds of this traffic heading east. The corresponding flow during the evening peak hour (1700 to 1800 hrs) is approximately 1,000 PCUs with the majority of traffic heading west.

11.64 The 2005 base traffic flows also show that 735 PCUs head along King's End into Bicester during the morning peak hour. A slightly lower flow heads south out of Bicester during the morning peak hour. Flows along King's End during the evening peak hour are slightly higher, with the majority of traffic heading south away from the town.

11.65 The 2005 base traffic flows demonstrate that the A41 accommodates approximately 2,800 two-way PCU movements during the peak hours.

Existing pedestrian and cycle provision

11.66 The routes of established footpaths and cycleways in the vicinity of the proposed development are shown in figure 11.8. The majority of the town is within a radius of approximately 2km from the centre of the site; a distance identified by PPG13 as being a reasonable journey by foot. In addition to the highlighted routes, there are footways adjacent to the majority of local roads in the vicinity of the site as well as a number of footpaths providing access towards Bicester town centre.

11.67 Middleton Stoney Road has a footway along its northern side from Howes Lane to King's End, varying in width between one and two metres. From the Middleton Stoney Road / Oxford Road / King's End roundabout towards the town centre, pedestrians can follow a footway with adequate street lighting to reach a pelican crossing just south of King's End / King's Avenue Junction. A footway of two metres wide on the eastern side of King's End and Church Street connects the pelican crossing to Bicester town centre via Church Street.

11.68 Pedestrians wishing to access the north of Bicester town centre can follow the footpath on the western side of King's End / Queen's Avenue. A pelican crossing between Kingsclere Road and King's End provides a crossing point to the eastern side of Queen's Avenue. A

footpath up to 3.5m wide links to the crossing point towards St. John's Street. A pedestrian refuge crossing at the junction with Manorsfield Road allows pedestrians to access the northern end of Bicester town centre.

11.69 To the east of the site, pedestrian links to the Tesco superstore and Bicester Village Outlet Shopping Area are provided along the eastern side of Oxford Road. These are two metres wide and continue along the northern and southern sides of Pingle Drive.

11.70 Route 51 of the national cycle network links Old Place Yard with the garden centre on A41 Oxford Road via Roman Road. A toucan crossing at the A41 roundabout and an uncontrolled pedestrian crossing at the A4421 / Pingle Drive roundabout allow pedestrian and cyclists to cross these junctions safely.

Existing bus services

11.71 Bus services currently operate principally along the A41 Oxford Road adjacent to the western side of the proposed development site. Further services operate within the Highfield Estate to the north and along A4095 Middleton Stoney Road following the northern boundary of the site.

11.72 Figure 11.9 shows the bus services operating within the vicinity of the proposed development and details of their services are summarised in figure 11.10. The bus journey to Oxford from Bicester takes approximately 35 minutes.

11.73 Service X5, operated by Stagecoach, provides a link from Cambridge to Oxford via St. Neots, Bedford, Milton Keynes, Buckingham and Bicester every 30 minutes during peak times between Mondays and Sundays. This service runs along the A41 to the east of the proposed development site, through the town centre bus station before exiting the north of Bicester via Buckingham Road.

11.74 Service X6, also operated by Stagecoach, provides a link from Northampton to Oxford via Towcester, Brackley and Bicester with a 3-4 hour frequency. This service runs along the A41, through Bicester bus station before exiting the town to the north-west via Bucknell Road.

11.75 Local services also provide links to Bicester town centre from the A41 corridor. These include routes X27/A/B/C, which stop on King's End every 20 minutes with an approximate journey time of 10 minutes. The bus stops on King's Road have shelters and timetables available. These services then connect to the town centre with links to a large employment area to the north east of Bicester. Once out of Bicester, these services provide links to Langford via Ambrosden, Glory Farm, Arncott and Launton and Oxford via the A34, Gosford and Summerton.

Service No.	Operator	Route	Service Times	Frequency
X5	Stagecoach	Cambridge, St Neots, Bedford, Milton Keynes, Buckingham, Bicester, Oxford	Mon–Sun 0540–2310 (weekday)	2 per hour during peak times
X6	Stagecoach	Northampton, Towcester, Brackley, Bicester, Oxford	Mon–Sat 0635–1600 (weekday)	Once every 3 to 4 hours
21	Grayline Coaches	King's End, Greenwood & Highfield Housing Estates	Mon–Sat 0725–1820 (weekday)	30 min
22	Grayline Coaches	Fields Farm, Langford, Southwold, Caversfield & Bure Park Estates	Mon–Sat 0815–1715 (weekday)	Every hour
23	Grayline Coaches	Fields Farm, Langford, Southwold, Caversfield & Bure Park Estates	Mon-Sat 0750-1750	Every hour
25/25A	Stagecoach	Bicester, Kirtlington, Bletchingdon, Oxford	Mon–Sat 0707–2110 (weekday)	2 -3 per hour during peak times
7/A/B/C	Stagecoach	Launton, Arncott, Glory Farm, Ambrosden, Bicester, Gosford, Oxford	A Daily B/C Mon-Sat	3 per hour
82	Heyfordian Travel (under contract to OCC)	Duns Tew, Middle Barton, Steeple Aston, Bicester	N/A	1 service Friday only
81	Grayline Coaches	Bicester, Ardley, Souldern, Banbury	Varies throughout week	Varies each day
37/37A	Grayline Coaches	Bicester, Fringford, Mixnury, Brackley	Varies throughout week	Varies each day

Figure 11.10 Existing bus services

Existing rail services

11.76 Figure 11.9 shows the location of the rail stations in Bicester and figure 11.11 summarises the direct rail services available from Bicester North and Bicester Town rail stations. Bicester North station is 950 m north of the town centre, while Bicester Town station is 800 m to the east of the site.

Station	Route	Journey Time (approximate)	Frequency
Bicester North	To London Marylebone To High Wycombe To Banbury	60 minutes 30 minutes 20 minutes	4 per hour 2 per hour 1 -2 per hour
Bicester Town	To Oxford	30 minutes	1 every two hours

Figure 11.11 Existing rail services

11.77 Bicester North rail station offers passengers a good range of facilities including coffee and snack shop, undercover (20 racks) and open air (10 racks) cycle storage and a fast ticket machine. There are also parking facilities available for motorised traffic on a pay and display basis with monthly, quarterly, bi-annual and annual season tickets available. Bicester Town station is unmanned. Undercover cycle storage is available with four racks provided near the station entrance.

11.78 The regular services throughout the day ensure a good range of destinations are readily accessible from Bicester North and Bicester Town rail stations. The employment, recreational and shopping opportunities within Oxford are available within a 30 minutes rail journey from Bicester Town station, while Banbury offers similar opportunities within a 20 minute rail journey of Bicester North station.

11.79 Employment opportunities within London are also accessible from Bicester North with four services an hour terminating at London Marylebone.

Existing accident record

11.80 Personal injury accident (PIA) data have been obtained for the roads in the vicinity of the site; namely, the A41, Oxford Road, A4421, Middleton Stoney Road, King's End, Queen's Avenue, Field Street and Howes Lane. The analysis of the data indicates that a total of 127 personal injury accidents were recorded along the roads during this period.

11.81 The data have been examined further in order to identify any clusters and trends in the nature and location of the accidents. Figure 11.12 identifies the locations of the accidents and a summary is contained in figure 11.13.

Location	Severity		
	Slight	Serious	Fatal
A41 Esso Roundabout	17	0	0
A41 Tesco Roundabout	5	0	0
Middleton Stoney Road / King's End	4	1	0
Middleton Stoney Road /Shakespeare Drive	2	1	0
Middleton Stoney Road/ Howes Lane	9	2	0

Figure 11.13 Accident analysis

11.82 There have been 17 personal injury accidents at the Esso roundabout. Whilst all of these resulted in slight injuries, two of the accidents involved vulnerable road users. Over half of the accidents were classed as shunts.

11.83 Of the five slight accidents at A4421 / Oxford Road / Pingle Drive roundabout (Tesco roundabout), three involved vulnerable users. Two of the accidents involved right turners while one of the accidents involved a shunt. The remaining accident occurred as a vehicle changed lanes.

11.84 There were a total of five accidents at the A4095 Middleton Stoney Road / King's End mini roundabout. Of the four slight accidents, two involved motorcyclists, while the only serious accident involved a pedestrian.

11.85 The junction of A4095 Middleton Stoney Road / Shakespeare Drive had a total of three slight accidents, of which one involved a vulnerable user, a motorcyclist. All three accidents occurred in wet conditions.

11.86 The A4095 Middleton Stoney Road / Howes Lane junction had a total of 11 accidents. Of these, nine were slight and two were serious. Of all the accidents, only one involved a motorcyclist, however, this was classed as serious. All 11 of the accidents at this junction involved traffic turning right.

11.87 It is evident that many of the accidents that occur along the A41 Oxford Road are shunt type accidents and are therefore related to vehicular speeds. Consequently, it is important that the access strategy for the development includes measures which will help to improve the situation along this corridor. Similarly, the high incidence of right turning accidents at the Howes Lane / Middleton Stoney Road junction is another area which will be addressed as part of the development proposals.

Future baseline

11.88 To support the growth of the Bicester area and to provide better transport services there are a number of committed schemes which affect all the transport modes in the area. These schemes will influence the future baseline conditions at the site.

Pedestrians and cycle schemes

11.89 Oxfordshire County Council's LTP supports the improvement of pedestrian and cycle schemes. From the south-west of Bicester, future extensions are shown to the existing cycle routes along the A441 Oxford Road and Pingle Drive into the town centre. The Oxfordshire County Council cycle map also illustrates future off-carriageway cycle tracks along the B4030 Middleton Stoney Road and the A4095 Howes Lane. These proposals are shown on figure 11.8.

11.90 The Bicester Integrated Transport and Land Use Study (ITS) dated March 2000 also identifies the future improvements and proposes enhancements to King's End / Queens Avenue and King's End / Church Street. This would further improve pedestrian and cycle access to the town centre from the south west of Bicester. The future improvements along King's End / Queens Avenue include road narrowing, provision of crossing facilities, surface treatments and cycle tracks. Future provision along King's End / Church Street includes cycle lanes in both directions along with chicanes.

11.91 The Oxfordshire County Council cycle map also identifies national cycle network proposals, promoted by Sustrans, for extensions to their route from the A41 through Bicester town centre and east towards Aylesbury.

Public transport schemes

11.92 Policy LT2 of the LTP, together with the Bicester ITS, identifies future public transport proposals for Bicester. In particular, this includes initiatives for a remote park and ride site in Bicester and, in the longer term, the East-West rail scheme.

11.93 The options for park and ride in Bicester are discussed further in a report produced by Halcrow Group Limited on behalf of Oxfordshire County Council. The Remote Park and Ride – Interim Report (February 2005) identifies the options for park and ride sites on the main transport corridors into Oxford. The report aims to identify schemes which are viable for inclusion in the LTP strategy and 5 year capital programme to 2011.

11.94 In relation to the Bicester to Oxford corridor, the most promising sites are identified on the southern edge of Bicester, adjacent to the A41. The Interim Report identifies that a park and ride site in this area is unlikely to attract traffic from the M40. However, the report found that there would still be a large catchment from Bicester and the surrounding area to the east, north and west, including Aylesbury, Middleton Stoney and Chesterton.

11.95 In addition to the proposals for a remote park and ride site in Bicester, the OCC LTP and the Bicester ITS identify the more immediate aim for moderate increases in frequency on the bus network in the town, direct links to Bicester North rail station and the upgrading of bus stops to a consistent quality standard.

11.96 The East-West rail scheme aims to provide a link between Bristol, Oxford, Bedford and Cambridge, routing through Bicester via Bicester Town rail station. The aim of the scheme is to provide increased train capacity and line speed along this route.

11.97 The Bicester ITS identifies the need for interchange improvements at both rail stations. In particular, with the longer term East-West rail scheme, the Bicester ITS suggests that further improvements are likely at Bicester Town rail station. In the shorter term, the Bicester ITS identifies proposals for increased line speeds and capacity on the Thames Line to Oxford.

Highway schemes

11.98 The need for a perimeter road linking the A41 to the A4095 Howes Lane is identified in both the Non-Statutory Cherwell Local Plan (NSCLP) and the Bicester ITS. Policy TR26 of the NSCLP identifies the A41 / A4095 link road as a developer-funded scheme and a provisional alignment is identified in the NSCLP. The Bicester ITS also identifies the proposals for the A41 / A4095 link road in relation to any future development to the west and south of Bicester.

11.99 Policy LT2 of the OCC LTP identifies the need for improvements at M40 junction 9. The Highways Agency and its consultants, Mott MacDonald, have prepared a package of improvements for this junction. The improvements have been agreed following a full

consultation process with the relevant local authorities and statutory consultees, including Oxfordshire County Council and Cherwell District Council.

11.100 The consultation indicated that the proposed package of improvements for M40 junction 9 should allow for the predicted number of household completions that would occur in Cherwell district between 1999 and 2020. The proposed development is currently predicted to be completed by 2014, within that period. Furthermore, the proposed site has been previously identified for residential development in the Non-Statutory Cherwell Local Plan 2011. It is therefore understood that the proposed development is included within the overall predicted residential dwelling completions in Cherwell district up to 2020.

11.101 It has subsequently been agreed with the Highways Agency that the current package of improvements for M40 junction 9 would satisfactorily accommodate the proposed residential development at South West Bicester. From discussions with the Highways Agency and Mott Macdonald, it is understood that the main on-site works are currently programmed to commence in late 2006 / early 2007 for the agreed package of improvements.

Potential effects

11.102 A transport strategy has been developed for the proposed development at South West Bicester. This includes details on travel by foot, cycle, public transport and by car and details of parking and vehicle access to the site. This information is included in the proposals chapter along with further details regarding the construction stage.

During construction

11.103 The number of daily movements associated with the construction of the site is difficult to estimate with certainty as it will depend on the preferred construction techniques and will also vary between construction phases. However, based on experience of other mixed use development schemes, it is anticipated that there are likely to be 145 construction vehicle movements during the working day. During the initial phase of development, when construction access is to be provided from Middleton Stoney Road, it is anticipated there are likely to be 65 construction vehicle movements during the working day. These movements will be a mix of HGVs and light vehicles. It is anticipated that HGVs will be approximately 15 to 25% of the total movements.

11.104 Middleton Stoney Road currently carries approximately 7,300 vehicle movements over a 12-hour period. During the day, outside the peak periods, Middleton Stoney Road carries over 4,000 vehicle movements in an 8-hour period from 0900 to 1700. Therefore, on the basis that all construction traffic uses Middleton Stoney Road during the initial phase of development, the 65 additional movements per day attributable to the construction phase equate to increases of less than 1% and 2% when compared to the existing flows during these 12-hour and 8-hour periods respectively.

11.105 The A41 Oxford Road currently carries approximately 29,000 vehicle movements over a 12-hour period. In the 8-hour period between 0900 and 1700, the A41 Oxford Road carries approximately 18,400 vehicle movements. Therefore, on the basis that all the construction traffic uses the A41 Oxford Road during the main phase of development, the 145 additional

movements per day attributable to the construction phase equate to increases of less than 1% when compared to the existing flows during these 12-hour and 8-hour periods.

11.106 The potential effects have been examined with respect to driver delay, severance, pedestrian amenity, accidents and safety for three scenarios:

- the main construction phase
- construction of the access junctions
- the initial stage of construction with access from Middleton Stoney Road.

Main construction phase

11.107 During the main phase of development, the anticipated changes in traffic are of a negligible magnitude on the A41 Oxford Road, which is only considered to be of low sensitivity. Consequently, it is considered that the impact of construction traffic would be of no significance in respect to driver delay, severance, pedestrian amenity, as well as accidents and safety.

Construction of the access junctions

11.108 During the main phase of construction, it will be necessary to construct the access junctions on the A41 Oxford Road and Middleton Stoney Road. The construction of these junctions is considered to cause a large magnitude of change. These links are of low sensitivity and this will result in a negative impact of substantial significance on driver delay, particularly along the A41 Oxford Road, as works will need to be undertaken along the existing road alignment.

11.109 Pedestrians and cyclists will need to cross these roads during construction of the new junctions. However, given the quantum of construction vehicle movements compared to the base flows, the impact on pedestrian amenity and severance is not considered to be significant.

11.110 With works along the A41 Oxford Road, it is considered that this could cause a medium magnitude of change with respect to accidents and safety. The sensitivity of the receptor is low and this would result in a negative impact of moderate significance.

Initial stage of construction – access from the Middleton Stoney Road

11.111 During the initial phase of development, construction traffic will use the B4030 Oxford Road and Middleton Stoney Road, which are considered to be of high sensitivity. However, the quantum of construction traffic is predicted to be negligible.

11.112 Given the levels of daily flows generated by construction traffic on the B4030, the impact on severance is not considered to be significant. In addition, as most construction movements will be outside the peak periods when delays occur around the area, the impact on driver delay is not considered to be significant.

11.113 Pedestrian activity will not be significantly affected by construction traffic despite the increase in HGVs. The proposed routing of the construction vehicles during the initial phase

reflects the objective of minimising the areas of residential development affected and hence pedestrian activity. Therefore, the impact on pedestrian amenity is not considered to be significant.

11.114 Given the anticipated changes in traffic in comparison to the base flows, the impact on accidents and safety is not considered to be significant.

Post-construction

11.115 The assessment of the post-construction phase has examined the impact of the development in 2014 when the proposed development and associated works will be complete. This includes the proposed highway access strategy which is shown on figure 11.14. The predicted traffic flows for the local highway network with and without the development have been derived. The 2014 AM and PM peak hour forecast base flows, without the development are indicated on figures 11.15 and 11.16. The equivalent 'with development' traffic flows are indicated on figures 11.17 and 11.18.

Post-construction traffic and provision of access junctions

11.116 With the completion of the proposed development in 2014, six new permanent junctions will be constructed. Each junction has been examined for the morning and evening peak periods, using the 2014 'with development' flows shown on figures 11.17 and 11.18. The results of this analysis are summarised in figure 11.19.

Queues are PCUs	2014 'With Development' Flows			
	AM Peak Hour		PM Peak Hour	
	RFC /D of S	Queue	RFC/D of S	Queue
A41 Access Roundabout				
A41 Oxford Road (north)	0.73	3	0.63	2
Eastern Approach	0.20	0	0.20	0
A41 Oxford Road (south)	0.68	2	0.76	3
Perimeter Road	0.48	1	0.33	1
Eastern Site Access Junction				
A41 Oxford Road (north)	54%	13	48%	11
Site Access	44%	6	42%	6
A41 Oxford Road (south)	70%	22	74%	24
North Eastern Access Junction				
Middleton Stoney Road (east)	-	-	-	-
Site Access	0.02	0	0.01	0
Middleton Stoney Road (west)	0.00	0	0.01	0
Northern Access Junction				
Middleton Stoney Road (east)	-	-	-	-
Site Access	0.07	0	0.04	0
Middleton Stoney Road (west	0.00	0	0.01	0
Northern Western Site Access Junction				
Middleton Stoney Road (east)	0.25	0	0.48	1
Site Access	0.07	0	0.08	0
Middleton Stoney Road (west)	0.40	1	0.48	1
Shakespeare Drive	0.38	1	0.15	0
Southern Site Access Junction				
Perimeter Road (east)	0.16	0	0.24	0
Site Access	0.26	0	0.16	0
Perimeter Road (west)	-	-	-	-

Figure 11.19 Capacity of the South West Bicester access junctions
Note: queues are in PCUs (Passenger Car Unit), RFC is Ratio of Flow to Capacity, D of S is Degree of saturation

11.117 Figure 11.19 shows the maximum queue and ratio of flow to capacity (RFC) / degree of saturation (D of S) for each approach arm at each junction. The RFC / D of S is a measure of the operating capacity of each road. RFCs below 0.85, and D of S below 90% indicate that the junction would operate satisfactorily. RFCs between 0.85 and 1.00, and D of S from 90% to 100% show that the junction is close to design capacity, and figures in excess of 1.00 /100% mean that the junction operates over design capacity.

11.118 The capacity analyses indicate that all six access junctions will operate comfortably within design capacity (RFCs no greater than 0.85) during the 2014 morning and evening peak hours. Furthermore, the analysis demonstrates that the forecast level of queuing along all approaches at the junctions will be minimal during both the peak periods.

11.119 The implementation of the proposed access junctions is likely to have a negative impact of moderate significance on driver delay at the eastern site access junction, where the medium

magnitude is anticipated at a low sensitivity receptor. It is considered that driver delay at the other junctions is not significant. Overall, the proposed access junctions will have a small impact on driver delay and this will result in an adverse effect of slight significance.

11.120 All six of the access junctions will be designed fully in accordance with current standards, thereby ensuring that any impacts relating to accidents and safety are minimised. Indeed with the implementation of the A41 access roundabout and the eastern access junction, it is proposed to reduce the speed limit of the A41 Oxford Road to 40 mph to the north of the proposed access roundabout. This measure will benefit road users in terms of accident and safety issues. Therefore overall it is considered that the access junctions will have no significant impact on accidents and safety.

11.121 Appropriate pedestrian crossing facilities will be provided at all the access junctions. These will be linked to continuous footway / cycleway routes ensuring pedestrians and cyclists can travel in comfort. Indeed, the pedestrian and cycle provision at the A41 access roundabout and the eastern access junction will improve conditions for pedestrians and cyclists crossing the A41 Oxford Road.

11.122 The road through Chesterton is frequently used by rat-running vehicles avoiding the local highway network in the vicinity of the A41 Esso Roundabout. The implementation of the proposed A41 access roundabout will be coupled with the closure of the slip roads for the existing grade-separated junction, which currently provides access to Chesterton. Access to Chesterton will then be provided from the new roundabout, the eastern arm of which will link to the existing unclassified road to the east of the A41 Oxford Road. The new arrangements for access to Chesterton from the A41 Oxford Road, coupled with the new perimeter road, are likely to reduce existing rat-running movements through Chesterton. The proposed access arrangements will therefore have a positive impact of slight significance in terms of pedestrian amenity in Chesterton.

11.123 Whilst the site access junctions will provide improved crossing facilities for pedestrians and cyclists, the proposed development will lead to increases in traffic at these junctions. Overall, the site access junctions will have a positive impact of slight significance in terms of pedestrian amenity and no significant impact on severance.

New perimeter road

11.124 The new perimeter road will comprise a new single carriageway link between the A41 Oxford Road and the Middleton Stoney Road / Howes Lane junction with crossing facilities for the existing public rights of way. These proposals are indicated on the access strategy (figure 11.14), together with the proposed connections to the existing highway network via the A41 Access Roundabout and Howes Lane Roundabout.

11.125 The flows on the new perimeter road have been derived for the 2014 'with development' scenario and are shown in figures 11.17 and 11.18 for the AM and PM peak hours respectively. Figure 11.20 shows the two-way traffic flows along the new perimeter road.

Flows are PCUs	2014 'With Development' Flows		
	AM Peak Hour	PM Peak Hour	24 hour
East of southern site access junction	525	565	6,218
North of southern site access junction	262	305	3,530
South of Howes Lane Roundabout	1,044	1,034	11,874

Figure 11.20 New Perimeter Road Two-Way Flows
PCUs (Passenger Car Unit)

11.126 The traffic flows predicted for the new perimeter road will be satisfactorily accommodated by the proposed single carriageway, given its road width and alignment. In the wider context, the new perimeter road will provide journey time savings, when compared with alternative routes on the existing local highway network. The magnitude of change is small and the sensitivity of receptor is low. This will result in a beneficial effect in terms of impact of driver delay of slight significance.

11.127 The new perimeter road will include a segregated pedestrian / cycle path along the northern side. This is a new facility that will link to the wider existing and proposed on- and off-site facilities.

11.128 The users of the two existing rights of way that cross the proposed alignment of the new perimeter road will need to be provided with pedestrian / cycle crossing facilities. These crossing facilities will be a minor inconvenience on the public rights of way. However, it should also be noted that the development proposals include the upgrading of these existing public rights of way.

11.129 The overall pedestrian / cycle facilities along the new perimeter road result in a beneficial impact on severance and pedestrian amenity. The magnitude of change is small and sensitivity of receptors low and this will result in a beneficial effect of slight significance.

11.130 The new perimeter road will be built to current standards with a segregated pedestrian / cycle path. A proportion of the traffic using the new perimeter road will have transferred from the existing local highway network, including junctions which currently have a poor accident record. The magnitude of change is small and sensitivity of receptors low. As a result, for road safety it is considered that this is a beneficial effect of slight significance.

Other new / improved junctions

11.131 The access strategy includes a further two junctions, which are:

- Chesterton Road / Perimeter Road Junction
- Howes Lane Roundabout.

11.132 Both junctions have been examined for the morning and evening peak periods, using the 2014 'with development' flows shown on figures 11.17 and 11.18 respectively. The results of the capacity analysis are summarised in figure 11.21.

Queues are PCUs	2014 'With Development' Flows			
	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Chesterton / Perimeter Road Junction				
Perimeter Road (south)	-	-	-	-
B4095 Link to Chesterton	0.33	1	0.64	2
Perimeter Road (north)	0.74	3	0.37	1
Howes Lane Roundabout				
Howes Lane	0.51	1	0.31	1
Middleton Stoney Road	0.42	1	0.39	1
Perimeter Road	0.25	0	0.47	1
B4030	0.23	0	0.29	0

Figure 11.21 Capacity of Other New / Improved Junctions
Note: queues are in PCUs (Passenger Car Unit), RFC is Ratio of Flow to Capacity

11.133 The capacity analyses indicate that both of the new / improved junctions will operate comfortably within design capacity (RFCs below 0.85) during the 2014 morning and evening peak hours. Therefore, the proposed development will cause a small magnitude of change with respect to driver delay. The sensitivity of receptor is low and this will result in an adverse impact of slight significance on driver delay at the junctions.

11.134 The implementation of the Howes Lane Roundabout will help reduce the number of right turning accidents that currently occur at the junction. Given that this junction and the Chesterton Road / Perimeter Road Junction will operate within capacity and their designs conform to current standards, even with the increased traffic flows there will be a positive impact in relation to accidents and safety. The magnitude of change is small and the sensitivity of receptor is low and this will result in a beneficial effect of slight significance.

11.135 The increased traffic flows at these junctions will have a negative impact in terms of severance and pedestrian amenity, despite the proposed pedestrian facilities, particularly at the Howes Lane Roundabout, which will provide improved facilities for the increased pedestrian demand. The magnitude of change is small and sensitivity of receptor is low, resulting in an adverse effect of slight significance.

Existing A41 Esso Roundabout

11.136 The proposed development will result in an altered pattern of traffic flows at the A41 Esso Roundabout. Demand flows will increase along some approaches as a result of traffic generated by the proposed development. In many instances, these increases are counter-balanced by decreases along the approaches as a result of background traffic reassigning onto the proposed perimeter road. In this regard the total approach flows at the roundabout are forecast to increase by 68 PCUs in the morning peak hour and by 12 PCUs during the evening peak hour.

11.137 The junction has been examined for the morning and evening peak periods, using the 2014 'with development' flows shown on figures 11.17 and 11.18. The results of the capacity analysis are summarised in figure 11.22.

Queues are PCUs	2014 'With Development' Flows			
	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
A41 (north)	0.46	1	0.49	1
A41 (east)	0.37	1	0.51	1
A41 Oxford Road (south)	0.61	2	0.67	2
Esso Services	0.15	0	0.14	0

Figure 11.22 Existing A41 Esso Roundabout
Note: queues are in PCUs (Passenger Car Unit), RFC is Ratio of Flow to Capacity

11.138 The capacity analyses indicate that the existing A41 Esso Roundabout will operate within its design capacity (RFCs below 0.85) during the 2014 morning and evening peak hours.

11.139 The A41 Esso Roundabout is in an area of high sensitivity and the proposed development will have a negative impact on driver delay at the roundabout. The magnitude of change is small and this adverse effect is of moderate significance.

11.140 The actual traffic flow increases at the A41 Esso Roundabout will be negligible and not significant and therefore there would be no impact in relation to accidents and safety, severance and pedestrian amenity. No significant effects have been predicted.

Wider highway network

11.141 The proposed development will have an effect on the pattern and quantum of traffic flows along the wider higher network and the change in flows has been assessed on the roads shown in figures 11.23 to 11.25. These figures compare the forecast base and 'with development' flows for the 2014 AM and PM peak hours as well as for the predicted annual average daily traffic (AADT).

11.142 These figures highlight areas of the network where traffic flows are forecast to change following the implementation of the development. It is important to note that the predicted changes in vehicular flows do not necessarily represent traffic that is travelling to or from the proposed development. Indeed, some of the increases are due to the reassignment of background traffic in response to the revised highway infrastructure that will accompany the proposed development.

Flows are Two-Way PCUs	2014 Forecast Base	2014 With Dev	Change in Flow	% Change
B4030	589	627	+38	+6%
Howes Lane	719	1,037	+318	+44%
Shakespeare Drive	520	561	+41	+8%
King's End	1,579	1,569	-10	-1%
A4421 Oxford Road	2,168	2,093	-76	-3%
Eastern Perimeter Road	2,513	2,664	+150	+6%
A41 (south)	3,169	3,826	+657	+21%
A4095 Chesterton	782	782	-	-

Figure 11.23 Wider Network Flows – 2014 AM Peak Hour
Note: PCUs – Passenger Car Unit

Flows are Two-Way PCUs	2014 Forecast Base	2014 With Dev	Change in Flow	% Change
B4030	661	697	+36	+5%
Howes Lane	709	1,062	+354	+50%
Shakespeare Drive	634	673	+39	+6%
King's End	1,724	1,664	-59	-3%
A4421 Oxford Road	2,748	2,633	-114	-4%
Eastern Perimeter Road	2,338	2,472	+134	+6%
A41 (south)	3,089	3,728	+639	+21%
B4095 Chesterton	730	730	-	-

Figure 11.24 Wider Network Flows – 2014 PM Peak Hour
Note: PCUs – Passenger Car Unit

Flows are Two-Way PCUs	2014 Forecast Base	2014 With Dev	Change in Flow	% Change
B4030	5,286	5,457	+171	+3%
Howes Lane	5,980	8,500	+2,520	+42%
Shakespeare Drive	5,006	5,508	+502	+10%
King's End	20,845	19,109	-1,737	-8%
A4421 Oxford Road	30,908	28,898	-2,010	-7%
Eastern Perimeter Road	33,788	34,494	+706	+2%
A41 (south)	38,258	47,215	+8, 957	+23%
B4095 Chesterton	8,812	8,812	-	-

Figure 11.25 Wider Network Flows – 2014 Annual Average Daily Traffic (AADT)
Note: Flows are vehicles

11.143 For the purposes of this assessment, all links are considered to be sensitive receptors on the basis of the criteria defined in the IEMA Guidance. Links in the vicinity of, and along, the A41 Oxford Road corridor will be particularly sensitive during the peak hour periods, given

the existing magnitude of driver delay during these periods. Any potential impact on links such as the Shakespeare Drive and King's End may also have an influence outside these peak periods, due to the nature of the sensitive receptors along these links, e.g. schools, shops and other community facilities.

11.144 Based on the above, the impact of the development traffic warrants further investigation along the following roads:

- Howes Lane
- A41 (South).

11.145 Traffic flow along the following links is forecast to reduce by a magnitude that would have a positive environmental impact:

- King's End.
- A4421 Oxford Road

11.146 With the development, flows along Howes Lane will increase by 318 PCUs during the AM peak hour and 354 PCUs in the PM peak hour when compared to the 2014 forecast base scenario. However, only a small proportion of the increase in flow is attributable to traffic generated by the proposed development. The development will only generate a total of 81 and 73 two-way PCUs during the AM and PM peak hours respectively. This quantum of additional traffic, equating to approximately one additional vehicle per minute in any direction, will not have a material impact on the operation of the Howes Lane corridor. A similar magnitude of impact is predicted based on the AADT.

11.147 Traffic flow along the A41 Oxford Road (south) towards M40 junction 9 will increase by 21% during the morning and evening peak hours. In this regard, it is important to note that the Highways Agency has confirmed that the package of improvements scheduled to be implemented at M40 junction 9 have been designed to accommodate the proposed residential development at south west Bicester. Consequently, there will be no significant impact in terms of driver delay, safety, pedestrian amenity and severance.

11.148 Taken together, the increases in flow along the wider highway network will result in a small change with regard to driver delay and safety. The sensitivity of the receptor is low and this will result in an adverse effect of slight significance. No significant impacts for severance and pedestrian amenity have been predicted.

Rail services

11.149 Of the public transport trips that will be generated by the proposed development, 80% will use the bus services. In terms of rail use, the assessment has demonstrated that the development will generate a total of 63 and 55 two-way rail trips, during the morning and evening peak hours respectively.

11.150 High frequency bus services operate between Bicester and Oxford and these will be readily accessible to residents and occupiers of the proposed development, it is therefore likely that the majority of rail trips would utilise Bicester North rail station to access services along the London to Birmingham line. Bicester North rail station is currently served by six trains per

hour during the peak periods. Therefore, the additional demand for rail travel generated by the proposed development should be satisfactorily accommodated on the existing services. The magnitude of change is negligible and no significant effects have been predicted.

Mitigation

During construction

11.151 The proposed construction strategy will minimise the impact of the construction traffic as set out in the proposals chapter (chapter 3).

11.152 In relation to the construction of the access junctions, particularly along the A41 Oxford Road, traffic management measures will be introduced along the A41 and Middleton Stoney Road to ensure that speeds are reduced and lanes are clearly marked. If single lane working is required along the A41 Oxford Road, this will generally be restricted to off peak periods. These measures will be discussed with Cherwell District Council and Oxfordshire County Council.

Post-construction

Development access junctions

11.153 Slow mode facilities will be provided around all new road infrastructure where appropriate. This will include pedestrian footways/footpaths, on and off carriageway cycle lanes, shared pedestrian/cycle paths, together with pedestrian and cycle crossing facilities.

11.154 The recommended on-site slow mode proposals include the promotion of a network of clearly signed off-carriageway pedestrian / cycle paths throughout the development. These links will be fully integrated with the existing pedestrian and cycle facilities in area, including those giving access into Bicester. This will ensure that the proposed development is well connected to the existing and future networks that surround the site. These measures will be beneficial with respect to pedestrian amenity and severance.

11.155 It is proposed to extend the bus network into the site through the diversion of the existing service 27. This service will loop through the site via the local centre and it will be possible to achieve a 30-minute frequency throughout the day with the requirement for only one additional vehicle. In addition, a stand alone shuttle bus between the site and central Bicester is proposed which would also operate at a 30 minute frequency. The proposals will ensure convenient access to the existing bus services that operate along the A41 Oxford Road corridor. As a result, the majority of residents and occupiers (including the proposed schools) within the proposed development are located within a 400m walking distance of frequent high quality bus services. This will ensure that the bus provides a convenient and attractive option for residents and occupiers for trips within Bicester and along the A41 Oxford Road corridor to destinations including Oxford.

Wider highway network

11.156 The development proposals include improved pedestrian and cycle accessibility to local areas surrounding the site. In particular there will be a new roundabout at the Middleton

Stoney Road / Howes Lane junction. This measure will assist in controlling the additional traffic movements in the area and movements by other modes. These measures will reduce the impact of the development on accidents and safety.

11.157 A travel plan will be prepared to encourage the use of public transport, walking and cycling and to minimise car movements associated with the proposed mixed use development. The main focus for the travel plan will be on the employment and retail elements of the development. However, specific measures will also be developed for the residential, community and school uses. A framework for the travel plan is contained in the TA.

11.158 The proposal to extend the bus network into the site through the diversion of the existing service 27 and the introduction of a new shuttle bus (as described above) will also mitigate the potential impact on the wider highway network. The strategy will encourage residents and occupiers to travel by bus rather than by car, thereby reducing the impact of the development on local roads.

Residual effects

During construction

11.159 As a consequence of the measures that will be introduced, the residual effects of the construction work relating to driver delay and safety will be reduced to adverse effects of moderate and slight significance.

Post-construction

Development access junctions

11.160 The improvements to the network of pedestrian and cycle routes both within and outside the site is likely to have the additional benefit of releasing currently suppressed demand for use of these routes. Proposed on and off site improvements to the pedestrian and cycle networks will significantly enhance the permeability of the area for those choosing to travel by these sustainable modes.

11.161 Taken together, the mitigated measures will result in a positive impact of moderate significance in terms of pedestrian amenity and a positive impact of slight significance on severance.

11.162 However, the increased pedestrian and cycle crossing facilities are likely to have negative impact of slight significance impact on driver delay. There will be no significant impact on accidents and safety.

Wider highway network - 2014

11.163 The residual effect following the implementation of traffic, pedestrian and public transport measures is likely to be an adverse impact of slight significance to driver delay but no significant impact for safety, severance and pedestrian amenity.

11.164 The residual impacts of the development are summarised in figure 11.26.

Topic	Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Significance	Level of certainty
Traffic and transport	Impact of construction of junctions and traffic on driver delay	Low	Medium	Short term	Adverse	Moderate	Reasonable
	Impact of construction of junctions and traffic on safety	Low	Small	Short term	Adverse	Slight	Reasonable
	Impact of proposed access junctions on driver delay	Low	Medium	Long term	Adverse	Slight	Reasonable
	Impact of proposed access junction on severance	Low	Small	Long term	Beneficial	Slight	Reasonable
	Impact of proposed access junctions on pedestrian amenity	Low	Medium	Long term	Beneficial	Moderate	Reasonable
	Impact of perimeter road on driver delay, severance, pedestrian amenity and safety	Low	Small	Long term	Beneficial	Slight	Reasonable
	Impact of the other new / improved junctions on driver delay, severance and pedestrian amenity	Low	Small	Long term	Adverse	Slight	Reasonable
	Impact of the other new / improved junctions on safety	Low	Small	Long term	Beneficial	Slight	Reasonable
	Impact on driver delay at the existing A41 Esso Roundabout	Low	Small	Long term	Adverse	Moderate	Reasonable
	Impact on driver delay on the wider highway network	Low	Small	Long term	Adverse	Slight	Reasonable

Figure 11.26 Traffic and transport residual effects

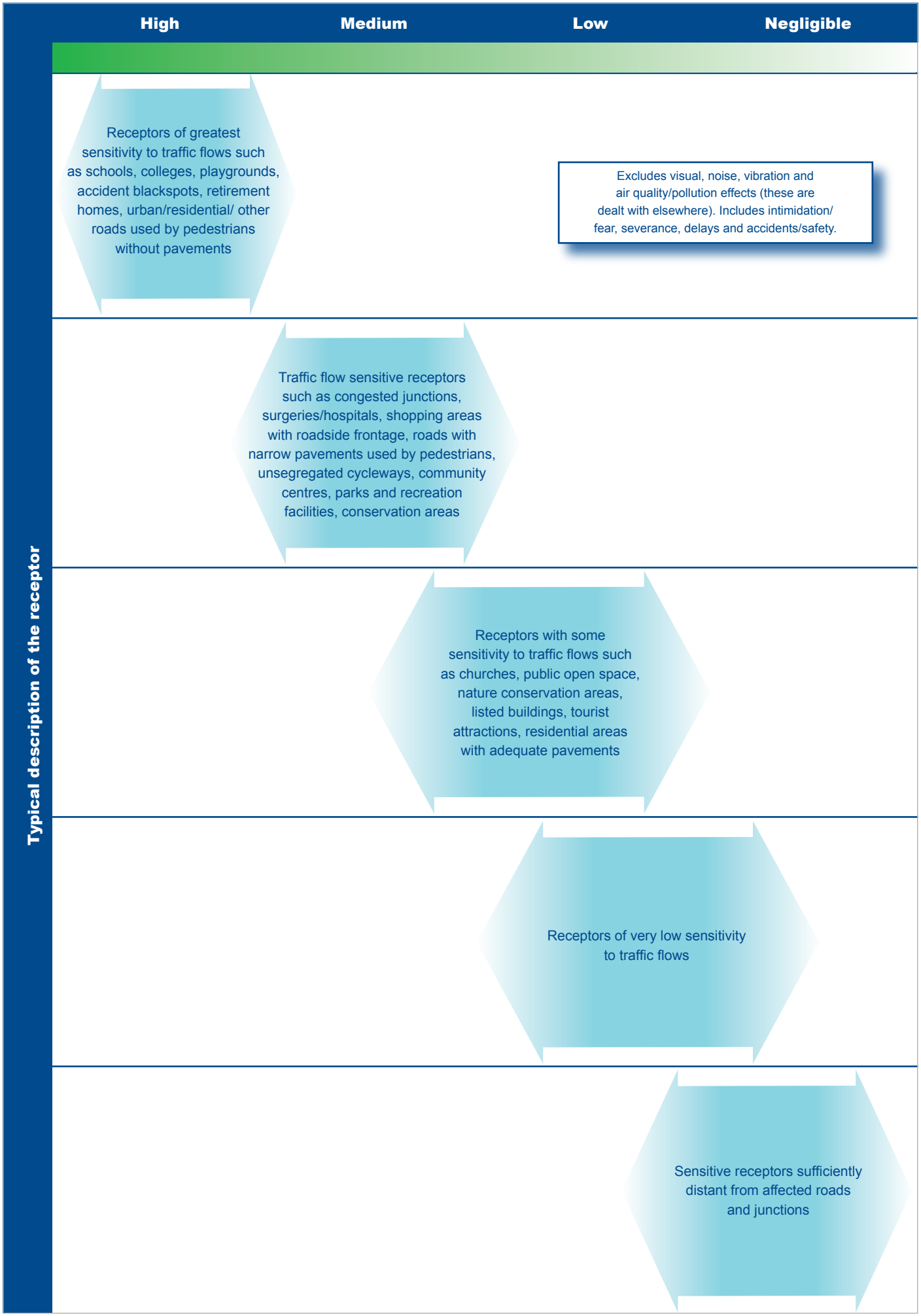
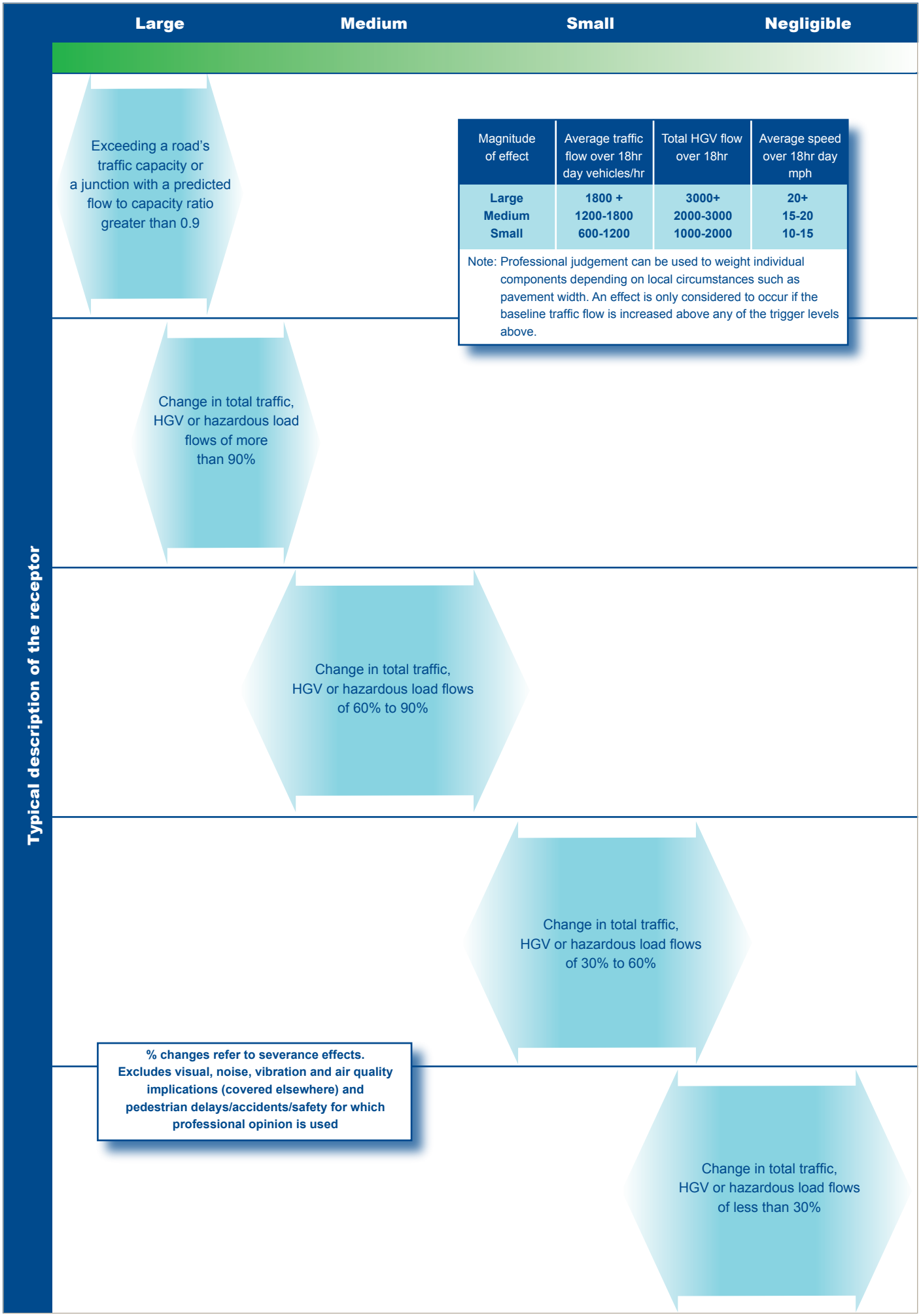


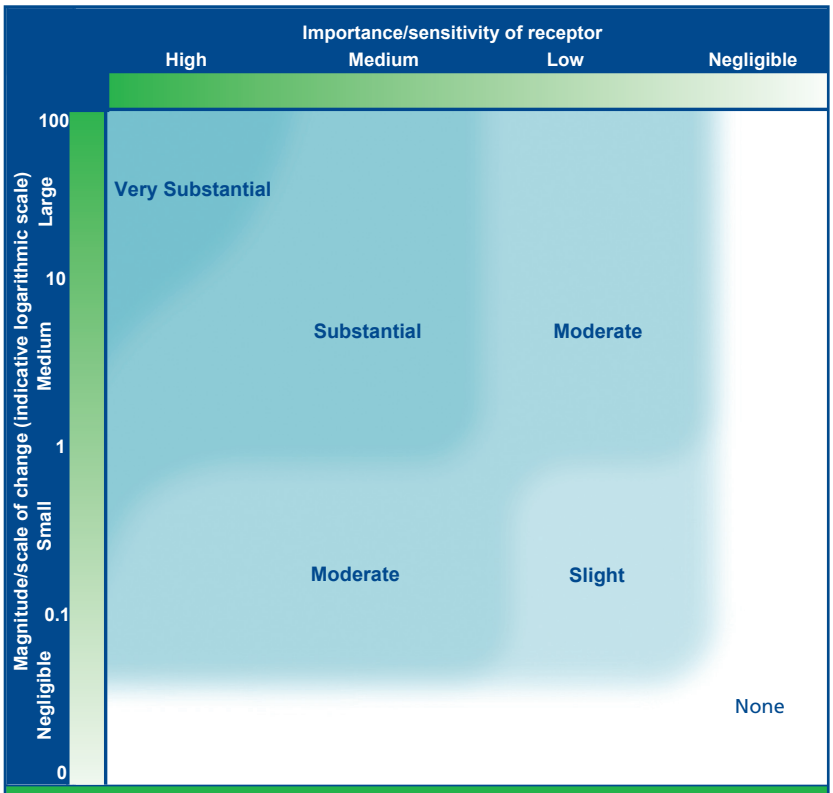
Figure 11.2 Traffic and transport: sensitivity or importance of receptor



Magnitude of effect	Average traffic flow over 18hr day vehicles/hr	Total HGV flow over 18hr	Average speed over 18hr day mph
Large	**1800 +**	**3000+**	**20+**
Medium	**1200-1800**	**2000-3000**	**15-20**
Small	**600-1200**	**1000-2000**	**10-15**

Note: Professional judgement can be used to weight individual components depending on local circumstances such as pavement width. An effect is only considered to occur if the baseline traffic flow is increased above any of the trigger levels above.

Figure 11.3 Traffic and transport: magnitude of change



Very substantial:
A change in total traffic, HGV or hazardous load flow of greater than 90% of the baseline on receptors of medium to high sensitivity; or a change in total traffic, HGV or hazardous load flow of 60 to 90% of the baseline on receptors of high sensitivity to traffic; or a change in total traffic, HGV or hazardous load flow of 30 to 60% of the baseline on receptors of the highest sensitivity to traffic.

Substantial:
A change in total traffic, HGV or hazardous load flows of greater than 90% of the baseline on receptors that are sensitive to traffic flow (e.g. hospitals, shopping centres and areas with narrow pavements); or a change in total traffic, HGV or hazardous load flows of 60 to 90% of the baseline on receptors of medium to high sensitivity to traffic; or a change in total traffic, HGV or hazardous load flows of 60% of the baseline on a receptor of high sensitivity to traffic such as schools, playgrounds and accident blackspots.

Moderate:
A change in total traffic, HGV or hazardous load flows in excess of 60% of the baseline on receptors of some sensitivity to traffic, such as churches, public open space, tourist attractions and residential areas with adequate pavements; or a change in total traffic, HGV or hazardous load flows of 30 to 60% of the baseline on receptors of medium sensitivity (e.g. hospitals, shopping centres and areas with narrow pavements) and high sensitivity (schools, playgrounds and accident blackspots).

Slight:
A change in total traffic, HGV or hazardous load flows of between 30 and 60% of the baseline on receptors of some sensitivity to traffic, such as churches, public open space, tourist attractions and residential areas with adequate pavements.

Not significant:
A change in total traffic, HGV or hazardous load flows of less than 30% of the baseline on receptors of very low sensitivity or sensitive receptors significantly distant from affected roads and junctions.

Figure 11.4 Traffic and transport significance matrix