

## **6 TRAFFIC, ACCESS AND MOVEMENT**

### **6.1 INTRODUCTION**

**6.1.1** This chapter considers the impact of the proposed development on road traffic, access arrangements and movement at the Heyford Park site. Full details are included in the Transport Assessment (TA), which was carried out for the proposed development by Arup and is included in the planning application submission as a separate supporting document. The TA considers the various access and mobility issues associated with the site and includes estimates of traffic generation arising from the proposed development, an assessment of the ability of the highway network to accommodate the proposals and an assessment of the accessibility of the site by alternative modes of transport to the private car. The Transport Assessment was prepared in consultation with Oxfordshire County Council; the Highways Authority and the Highways Agency. The scope of the assessment was agreed prior to the work commencing.

### **6.2 DEVELOPMENT CONTENT**

**6.2.1** Full details of the proposed development content are contained in Chapter 3 of the Environmental Statement. The Transport Assessment has been carried out based on the following land uses:

- Residential - 1,075 dwellings;
- B1 Office – 15,658m<sup>2</sup>;
- B2 Office - 17,996m<sup>2</sup>;
- B8 Storage – 86,113m<sup>2</sup>;
- Heritage Centre - 4195m<sup>2</sup>;
- Conference Centre – 4150m<sup>2</sup>.

**6.2.2** The floor areas for B2 Office and B8 Storage as assessed in the Transport Assessment and shown above are 890m<sup>2</sup> and 2,313m<sup>2</sup> respectively higher than the final figures shown in Chapter 3. The assessed floor area of the Heritage Centre is 5m<sup>2</sup> less. These minor discrepancies are a result of changes to the development content proposals after the Transport Assessment was carried out.

**6.2.3** A proportion of the above development content already exists and is subject to temporary planning consent. However, Oxfordshire County Council requires the Transport Assessment to assess the impact of the full development onto a base situation comprising no existing development at the site.

**6.2.4** Car parking will be provided in accordance with Oxfordshire County Council's guidance. There are a number of other proposed land uses that will provide facilities for the new settlement but no trips have been included in the Transport Assessment for these uses as it is assumed that any associated trips will either be internal to the site or pass-by of existing trips.

**6.2.5** Facilities in this category are:

- Retail;
- Church;
- Community Centre;
- Bar/restaurant;
- Nursery; and

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- Primary School.

## **6.3 METHODOLOGY**

**6.3.1** The Transport Assessment of the proposed development was carried out in accordance with Oxfordshire County Council Guidelines. The assessment considered a number of issues:

- Trip generation - the amount of traffic predicted to be generated by the development;
- Traffic flows - the volume of traffic on the local road network;
- Junction capacity - the ability of key junctions to accommodate the predicted traffic volume and flows;
- Public Transport - the types and levels of service of public transport serving the site; and
- Pedestrian and Cycle facilities – the facilities and routes to enable people to travel to, and through, the site by cycle and on foot.

### **Trip Generation**

**6.3.2** The trip generation for the proposed development was derived by interrogating the TRICS computer database. The TRICS database comprises a large number of records of individual developments across a wide range of land-use categories. Within these records are one or more traffic or multi-modal survey counts, which are backed up by detailed information on the sites themselves and the local environment. TRICS was used to analyse selected sets of survey counts in order to produce trip rate information for various land-uses. The analysis was carried out to provide trip generation figures for both the morning (AM peak) and evening (PM peak) rush-hours.

**6.3.3** Separate trip generations were derived for residential and commercial land use classes on the site. Following discussion, trip rates were agreed with Oxfordshire County Council for residential, B1, B2 and B8 land uses. Trip rates for the Heritage Centre and Conference Centre were obtained directly from TRICS.

### **Traffic flows**

**6.3.4** Existing traffic flows on the local road network in the area were obtained from a series of traffic surveys carried out in 2006 at various locations in the vicinity of the site. Traffic flows for 2004, related to Junction 10 of the M40 were supplied by the Highways Agency

### **Assessment Years**

**6.3.5** Traffic flows have been calculated for a number of scenarios.

#### **2006 Base**

**6.3.6** The 2006 base is derived from the 2006 survey data but with the traffic generated by the existing Heyford Park development removed. The Junction 10 survey data was collected in 2004 and factored to produce the 2006 base from which the existing Heyford Park development traffic was removed as above.

**2013 Base**

- 6.3.7** The 2013 base represents the 2006 base with background traffic growth applied up to the opening year of 2013. Background traffic growth from base year to opening year has been calculated using NRTF Central Case adjusted by TEMPRO local forecasts for Cherwell Rural and Bicester. This produces a growth factor of 12.7% (AM) and 12.8% (PM) over the period 2006 to 2013.

**2013 Full Development**

- 6.3.8** The 2013 full development scenario represents the 2013 base plus full Heyford Park development content as described in the previous section.

**2028 Full Development**

- 6.3.9** The 2028 full development scenario represents the 2006 base with traffic growth applied to 15 years after opening plus full Heyford Park development content. The opening year plus 15 test was required by the Highways Agency for Junction 10 only.

**Junction Capacity**

The capacity of key junctions was assessed using PICADY, ARCADY and LINSIG computer software programs. PICADY is a program for analysing the capacity and performance of a priority junction and ARCADY for roundabouts. Performance of the junction is measured in Ratio to Flow Capacity (RFC). LINSIG is a program for assessing the operation of traffic signals and maximising the operation of a signal controlled junction.

**6.4 PLANNING POLICY AND GUIDANCE**

- 6.4.1** The national policy framework concerning the transport planning aspects of new developments can be found in Planning Policy Guidance PPG13, 'Transport' (March 2001). Other relevant policy is discussed within the Transport Assessment.

**PPG 13 Transport**

- 6.4.2** PPG 13 provides advice on how local authorities should integrate transport and land-use planning for all types of development.
- 6.4.3** The key aim of PPG13 is to ensure that local authorities carry out their land-use policies and transport programmes in ways which help to:
- promote more sustainable transport choices for both people and for moving freight;
  - promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling; and,
  - reduce the need to travel, especially by car.
- 6.4.4** A key planning objective set out in PPG13 is to ensure that jobs, shopping, leisure facilities and services are accessible by public transport, walking and cycling. This helps to promote social inclusion and is important for everyone, but especially for those who do not have access to a car.

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**6.4.5** The principles of PPG13 are, in general, incorporated into the proposed development. Jobs and housing are provided together on the same site, provision will be made to support public transport, Walking and cycling facilities will be provided and a travel plan introduced, facilitated by a Travel Plan Co-ordinator.

Prospective residents of the development will have access to the proposed employment, shops, community facilities, the extensive countryside area and public transport services. The scale of development and the proposed mix of uses on the site itself offer opportunities for a more self-sustaining community.

## 6.5 SIGNIFICANCE CRITERIA

**6.5.1** Assessing the significance of environmental effects is not straightforward, since there are frequently no standards against which to make comparison. However, in order to aid judgement significance criteria have been defined which follow the generic framework shown in Table T1.

<b>Significance</b>	<b>Criteria</b>
Extreme	These effects represent key factors in the decision making process. They are generally, but not exclusively, associated with sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated.
Major	These effects are likely to be important considerations at a regional or district scale but, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issues during the decision making process.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

**6.5.2** Qualitative and quantitative assessments have been undertaken of the potential sensitivities and professional judgement has been exercised to determine whether the impacts associated with the proposals are likely to be significant in the context of the local road network.

## 6.6 DESCRIPTION

### Camp Road

- 6.6.1** Access to the existing site and proposed areas of further development are from Camp Road. This road bisects the site on a general east to west alignment. The former runway, taxiways and other facilities associated with the airfield itself lie to the north of Camp Road. All the existing commercial activity is in this area as well as a small number of dwellings.
- 6.6.2** There are four existing access points on the north side of Camp Road. From west to east, these are:
- The Lorry Access Gate (Gate 7) predominantly provides the HGV access route to the parts of the flying field used for vehicle storage;
  - The Main Gate gives access to the office and other commercial areas north of Camp Road known as the 'Trident' due to its distinctive road pattern;
  - Soden Road is a cul-de-sac containing 10 large former officers' houses; and
  - Larsen Road is also a cul-de-sac of 36 dwellings.
- 6.6.3** On the south side of Camp Road, two roads; Dacey Drive and Dow Street provide access into the main area of existing dwellings. In addition, there are several blocked off accesses from Camp Road to both the northern and southern areas of the site.
- 6.6.4** The existing accesses from Camp Road into the site are illustrated in Figure T01.
- 6.6.5** Where it passes through the existing development, Camp Road has an overall width of 6m but is traffic calmed in five locations by buildouts which narrow the carriageway to one-way working.

### Wider Highway Network

- 6.6.6** At its western end, in Upper Heyford village, Camp Road terminates at a 'T' junction with the unclassified road from Lower Heyford to Somerton. To the north, beyond Somerton and junctions with minor roads to Ardley and Fritwell, the road meets the A4260 between the villages of North Aston and Duns Tew at an uncontrolled crossroads. The A4260 runs in a general north-south alignment from Banbury to Kidlington and thence Oxford. 3km south of the North Aston/Duns Tew junction the A4260 is crossed by the B4030 at the Hopcrofts Holt signalised junction. To the west the B4030 passes through The Bartons and then to Enstone and Chipping Norton.
- 6.6.7** East of Hopcrofts Holt the B4030 crosses the River Cherwell at a single carriageway bridge with traffic signals controlling priority. Contained within the signal controlled section is a crossroads junction; the north arm leading to the villages of Steeple Aston and Middle Aston, the south arm passing Rousham Park and joining the A4260 some 3km south of Hopcrofts Holt. Proceeding east, the B4030 crosses the Banbury to Oxford railway line adjacent to Heyford Station, bypasses Lower Heyford village centre and continues to Bicester after crossing the B430 at a signalised crossroads in Middleton Stoney.
- 6.6.8** Approximately 5km north of Middleton Stoney, and immediately north of the village of Ardley, the B430 terminates at Junction 10 of the M40 which also links with the A43 trunk road and the Cherwell Motorway

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Service Area (MSA). The B430 forms a north-south link between the M40 and the A34 trunk road at Weston-on-the-Green, which is some 5km south of Middleton Stoney. The A34 forms part of the strategic route from Southampton, via Oxford to join the M40 at Junction 9 and hence to the Midlands and North. Southwards the M40 leads to London and the M25.

- 6.6.9** About halfway between Ardley and Middleton Stoney, the B430 is joined from the west by an unclassified road that links with Camp Road just to the east of the proposed Heyford Park development. Camp Road joins the unclassified road at an asymmetrical crossroads; the southern arm joins the B4030 west of Middleton Stoney. The northern arm, Chilgrove Drive, formerly provided an emergency access route to the airfield but is now blocked off and virtually unused.
- 6.6.10** Immediately west of the Heyford Park site area, a further link, Kirtlington Road (leading to Port Way), leaves Camp Road and runs southwards, crossing the B4030 at a priority junction, and continuing south to join the A4095 just north of Kirtlington village. South of the village, the continuation of Port Way leaves the A4095 and, after passing through the village of Bletchington, eventually joins the A34 some 4km south of the B430 junction at Weston-on-the-Green.
- 6.6.11** The A4095 runs in a general northeast to southwest direction from Bicester to Kirtlington, Long Hanborough and finally to Witney. It crosses the A4260 at Bunkers Hill, a staggered priority crossroads 8km south of Hopcrofts Holt and 3km north of Kidlington.

### Bus Services

- 6.6.12** Heyford Park is served by a single bus route, the 25/25A/25B from Oxford to Bicester via local villages. This is a tendered service, paid for by Oxfordshire County Council and operated by RH Transport Services. The route is normally operated with low floor, wheelchair accessible vehicles.
- 6.6.13** The daytime service frequency is approximately one an hour in each direction with an additional service in both directions in the AM peak hour. A number of the off-peak services operate between Bicester and Kidlington only where a connecting bus is available for travel to/from Oxford. Evening services run Friday and Saturday only and there are also additional services to provide school access during term time. There are no services on Sundays or Public Holidays.
- 6.6.14** There are three bus stops located within the Heyford Park settlement; all on Camp Road. There is a bus shelter and stop for eastbound services on the north side of Camp Road approximately 150m east of the main gate. A similar distance to the west of the main gate, a small loop off of the highway houses a further bus shelter and stop that is currently served by buses going in both directions. A further eastbound stop is located adjacent to the Soden Road junction.

### Rail Services

- 6.6.15** The nearest railway station to Heyford Park is at Lower Heyford, approximately 4km to the south west. This is served by trains from Banbury to Oxford and provides direct services to those destinations plus a number

of other local stations. Weekday and Saturday frequencies vary between 90 minutes and three hours. There are no services on Sunday. At Oxford, changes are available to services to Bristol and the west, Reading and London Paddington, and south coast destinations. Banbury provides interchange with routes to Birmingham and further north, and also to the Chiltern line which runs south east to London via Bicester.

- 6.6.16** Heyford Park is some 8km from Bicester North station from where up to 4 services per hour run directly to London including Saturdays and Sundays. Some services are non-stop, with a Bicester to London journey time of less than an hour. A second station in Bicester, Bicester Town is at the end of a branch line from Oxford and is served at approximately 2 hour intervals Mondays to Saturdays. There is no Sunday service. The 25/25A/25B bus services from Heyford Park travel through Lower Heyford and to Bicester, although in both places the nearest bus stops are some distance from the stations.

### **Pedestrian and Cycle Facilities**

- 6.6.17** On the north side of Camp Road, there is a 2m wide pedestrian footway adjacent the carriageway between the Main Gate and the perimeter of the site at Larsen Road. To the south side of Camp Road, there is a footway set back from the kerbline by some 3m and separated from the carriageway by a verge and hedge/fence. This footway is generally in excess of 2m wide and runs the entire length of Camp Road, where it passes through the site, forming a continuous link from the caravan park at the eastern perimeter to Port Way in the west. A narrower (1m) footway adjacent to the carriageway continues as far as Upper Heyford village. There are no footways accompanying the two other roads out of Heyford Park, nor any on Port Way or Camp Road and its extensions eastwards beyond the edge of the site.
- 6.6.18** There are no controlled pedestrian crossing points on Camp Road. Dropped kerbs and tactile paving are provided to enable uncontrolled crossing of Camp Road via the splitter islands on the approaches to the Main Gate roundabout.
- 6.6.19** Street lighting is provided on Camp Road for its entire length through the site.
- 6.6.20** Public Rights of Way are considered in Chapter 14.
- 6.6.21** There are no formal cycle routes in the vicinity of the site, the closest being National Cycle Network Route 51 which passes through Bicester and then south to Oxford. The nature of the local highway network, consisting in the main of small-scale country roads with relatively light traffic volumes, provides potential for cycle use.

## **6.7 BASELINE CONDITIONS**

### **Existing Traffic**

- 6.7.1** There is an existing settlement and commercial/employment activity at Heyford Park. The majority of these existing land uses hold temporary planning consents and are therefore included in the outline planning application. Full details are provided in Chapter 3 of the Environmental Statement. Oxfordshire County Council requires the Transport Assessment to assess the impact of the full development onto a base situation

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comprising no existing development at the site. Nonetheless, traffic on the local road network is currently comprised of background traffic plus traffic related to the existing development.

### 2006 Base Year Traffic

- 6.7.2** The 2006 base year traffic flows are derived from the 2006 survey data but with the traffic generated by the existing Heyford Park development removed to accommodate Oxfordshire County Council's requirements. The Junction 10 survey data was collected in 2004 and factored to produce the 2006 base from which the existing Heyford Park development traffic was removed as above.
- 6.7.3** The operation of six junctions in the vicinity was tested for the 2006 base scenario:
- The staggered crossroads junction of Port Way with the B4030 Lower Heyford Road;
  - The 'T' junction of the minor road from Heyford Park with the B430 between Middleton Stoney and Ardley;
  - The Chilgrove Drive junction with Camp Road immediately east of Heyford Park;
  - The minor junction of Camp Road with Kirtlington Road (leading to Port Way);
  - The 'T' junction of Camp Road with the Lower Heyford to Somerton Road in Upper Heyford village; and
  - The signalised crossroads junction of the B4030 with the B430 at Middleton Stoney.
- 6.7.4** The junctions agreed for testing are illustrated in Figure T02.
- 6.7.5** All of the junctions were found to operate well within their theoretical capacity thresholds in both the AM and PM weekday peak hours.

### 2013 Base Year Traffic

- 6.7.6** The 2013 base year traffic flows represents the 2006 base with background traffic growth applied up to the opening year of 2013. Background traffic growth from base year to opening year has been calculated using NRTF Central Case adjusted by TEMPRO local forecasts for Cherwell Rural and Bicester. This produces a growth factor of 12.7% (AM) and 12.8% (PM) over the period.
- 6.7.7** The operation of the six junctions on the local highway network, plus Junction 10 of the M40 motorway (B430 roundabout only), was tested for the 2013 base scenario. Five of the six junctions were found to operate well within their theoretical capacity thresholds in both the AM and PM weekday peak hours. The signalised crossroads junction of the B4030 with the B430 at Middleton Stoney operated well within its capacity in the 2006 base scenarios, however it is forecast to operate above its theoretical capacity threshold by 2013 due to the impact of background traffic growth. In the 2013 base the junction is forecast to experience mean maximum queues of 25 in the weekday AM peak and 21 in the weekday PM peak.
- 6.7.8** Junction 10 was found to operate within its theoretical capacity in the AM peak. In the PM peak, the approach to the B430 roundabout from the M40 northbound off-slip road is at its theoretical capacity with a maximum queue of six vehicles predicted.



## 2028 Base Year Traffic

- 6.7.9** The 2028 base year traffic flows represents the 2006 base with background traffic growth applied up to 2028, the opening year plus 15 years. Background traffic growth from base year to opening year has been calculated using NRTF Central Case adjusted by TEMPRO local forecasts for Cherwell Rural and Bicester. This produces growth factors of 22.7% (AM) and 23.7% (PM) over the period.
- 6.7.10** The operation of Junction 10 of the M40 motorway (B430 roundabout only), was tested for the 2028 base scenario. The junction was found to operate within its theoretical capacity in the AM peak. In the PM peak, the approach to the B430 roundabout from the M40 northbound off-slip road is forecast to operate in excess of its theoretical capacity with a maximum queue of 14 predicted.

## Safety

- 6.7.11** A methodology for the collection and analysis of five-year (2001 to 2006) accident data was agreed with Oxfordshire County Council. Accidents occurring on all roads in the area were included except those on the M40 main carriageways. Accidents were grouped into the links and junctions where they occurred and any links and junctions exceeding an accident rate of one accident per year were investigated further. A comparison to the predicted COBA rate was undertaken to ascertain if the observed rate exceeded the predicted accident rate. All personal injury accidents involving a vulnerable road user were investigated regardless of the total accident rate on the link/junction where they occurred.
- 6.7.12** 147 personal injury accidents were recorded within the five year period analysed of which six involved vulnerable road users. Of the six, four involved pedestrians of which, two were fatal, one serious and one slight in terms of severity of injuries. The remaining two vulnerable road user accidents involved cyclists, with both of them resulting in injuries of slight severity. All other recorded personal injury accidents were solely vehicular.
- 6.7.13** It was agreed with Oxford County Council that links or junctions where the accident rate exceeds one per annum would be investigated plus all accidents involving vulnerable road users. Over the study area there are five locations (one link and four junctions) that have an accident rate greater than one accident per annum. Only one vulnerable road user, a cyclist, was injured at these accident clusters.
- 6.7.14** The locations of personal injury accidents and clusters are illustrated in Figure T03.
- 6.7.15** The following accident analysis considered each of the five clusters relative to the predicted COBA accident rate.

### **B4030 / A4260 Hopcrofts Holt Junction**

- 6.7.16** Nine personal injury accidents were recorded at the Hopcrofts Holt signalised junction. None of the accidents involved vulnerable road users. The accidents resulted in one fatality, one serious severity and seven slight severity injury accidents.

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**6.7.17** The fatality was considered to be due to excessive speed, resulting in the driver losing control on approach to the junction. The COBA predicted accident rate of 2 accidents per annum is higher than the observed rate of 1.8 accidents per annum, therefore it was considered that no inherent accident problem exists at this location.

***B430 Ardley Road – Between Heyford Park turn and Church Road, Ardley***

**6.7.18** This link has had nine personal injury accidents recorded during the five year period analysed. There are several minor accesses along this link. At two of these, there have been personal injury accidents recorded; two at one access and one at the other.

**6.7.19** These junctions are therefore within the 1 accident per annum threshold and independent of the link and therefore, the link has an actual accident rate of less than 1 accident per annum and thus no further analysis was required.

***M40 Junction 10 - B430 Roundabout***

**6.7.20** The southern of the three roundabouts that form Junction 10 shows a cluster of 13 personal injury accidents. Of these accidents, 12 involved heavy goods vehicles, with ten of them overturning whilst navigating the roundabout. The HGVs appear to be travelling too fast for the roundabout, which has an adverse camber; additionally some are stated to have been poorly loaded. The data recorded one vehicle being driven by a foreign driver.

**6.7.21** The number of accidents at this location exceeds the predicted COBA analysis accident rate which is 1 accident per annum.

***M40 Junction 10 - Cherwell Roundabout***

**6.7.22** Cherwell Roundabout is the centre roundabout of the three that form Junction 10. For clarity, it was investigated in three sections; the circulating accidents, the link to Padbury Brook roundabout and the link from Padbury Brook roundabout. Only four personal injury accidents have been recorded circulating the Cherwell roundabout, all resulting in slight severity injuries. These four accidents were due to a mixture of causations including excessive speed, poor loading of vehicle and poor lane discipline.

**6.7.23** There have been nine personal injury accidents recorded on the southbound link towards Cherwell roundabout on the A43 from Padbury roundabout.

**6.7.24** There have been ten personal injury accidents recorded on the northbound link on the A43 in the vicinity of Cherwell roundabout heading towards Padbury Brook roundabout.

**6.7.25** The number of accidents at this location exceeds the predicted COBA analysis accident rate which is 1 accident per annum.

***M40 Junction 10 - Padbury Brook Roundabout***

**6.7.26** There have been eleven personal injury accidents recorded at the Padbury Brook roundabout during the five year period analysed. Two of these were attributed to a spillage on the surface causing drivers to lose control

of their vehicle. Of the remaining nine accidents, four involved HGVs, all resulting in slight severity injuries and five involved cars, with four slight severity injuries and one serious severity injury. Two accidents were of a shunt nature, resulting in slight severity injuries. The remaining seven accidents were a result of drivers crossing each other's path and either colliding or overturning as a result of swerving out of the oncoming vehicles path.

**6.7.27** The number of accidents at this location exceeds the predicted COBA analysis accident rate which is 1 accident per annum.

#### ***Accidents Involving Vulnerable Road Users***

**6.7.28** There have been two accidents involving pedal cyclists outside of the clusters already discussed. One of these accidents occurred on Camp Road where a motor vehicle clipped a cyclist resulting in a slight severity injury. The other occurred on North Street, Fritwell where a pedal cyclist was knocked off his cycle by an HGV following an argument between the cyclist and HGV driver.

**6.7.29** There have been four accidents involving pedestrians outside of the clusters already discussed. One of these occurred outside the Old Inn, in Somerton, where a woman was found lying in the road. She claimed that a driver had hit her and left the scene, however it was noted that the woman had been drinking. One accident occurred in Castle Fields Road, Ardley during snow and ice conditions where a driver was reversing slowly out of their drive and hit a small child playing in the snow, resulting in a serious severity injury.

**6.7.30** Two accidents involving pedestrians occurred at different junctions along Station Road (B430) in the vicinity of Ardley, both resulting in fatal injuries. The first involved a pedestrian, believed to be intoxicated, who fell into the path of a vehicle resulting in fatal injuries. The second was the result of a pedestrian stepping out into the path of an oncoming vehicle resulting in a fatal injury. Both accidents can therefore be attributed to an error by the pedestrian.

#### ***Conclusions***

**6.7.31** In conclusion, the analysis shows that over the study area there are five locations; one link and four junctions, that have an accident rate greater than one accident per annum;

- B430 south of Ardley;
- Hopcrofts Holt junction;
- M40 Jcn 10 southern (B430) roundabout;
- M40 Jcn 10 centre (Cherwell) roundabout; and
- M40 Jcn 10 northern (Padbury Brook) roundabout.

**6.7.32** The accident clusters are illustrated in Figure T03.

**6.7.33** The predicted COBA analysis accident rate was exceeded at the three roundabouts that together form Junction 10 of the M40.

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**6.7.34** There were a total of seven accidents involving vulnerable road users, six of which were outside the identified accident clusters.

## 6.8 TRIP GENERATION

**6.8.1** Trip generation rates were agreed with Oxfordshire County Council for residential, B1, B2 and B8 land uses. Trip rates for the Heritage Centre and Conference Centre were obtained directly from the TRICS database. A series of calculations were applied to the trip rates and development content to establish the number of trips that will be generated in the weekday AM and PM peak hours.

**6.8.2** The AM results are shown in Table T2 and the PM results in Table T3.

Land Use		Trip Rate		Trips		
		Arr	Dep	Arr	Dep	Total
Dwellings	1075	0.17	0.63	183	677	860
B1 Office	15,658sqm	1.81	0.28	283	44	327
B2 Office	17,996sqm	1.09	0.35	196	63	259
B8 Office	86,113sqm	0.23	0.11	198	95	293
Heritage Centre	4,195sqm	0.08	0.00	3	0	3
Conference Centre	4,150sqm	0.34	0.17	14	7	21
<b>Totals</b>				<b>878</b>	<b>886</b>	<b>1764</b>

**6.8.3** It can be seen from Table T2 that in an average weekday AM peak hour there will be 878 trips arriving and 886 departing giving a total of 1764 trips generated by the Heyford Park development.

Land Use		Trip Rate		Trips		
		Arr	Dep	Arr	Dep	Total
Dwellings	1075	0.51	0.29	548	312	860
B1 Office	15,658sqm	0.42	1.62	66	254	319

B2 Office	17,996sqm	0.21	0.83	38	149	187
B8 Office	86,113sqm	0.13	0.23	112	198	310
Heritage Centre	4,195sqm	0.02	0.23	1	10	11
Conference Centre	4,150sqm	0.35	0.30	15	13	27
<b>Totals</b>				<b>779</b>	<b>935</b>	<b>1714</b>

**6.8.4** It can be seen from Table T3 that in an average weekday PM peak hour there will be 779 trips arriving and 935 departing giving a total of 1714 trips generated by the Heyford Park development.

## **6.9 DISTRIBUTION**

**6.9.1** A methodology, based on Census data, was developed to distribute the generated trips onto the local road network. Journey to Work data from the 2001 Census was obtained from the Government's Office for National Statistics. This provided details of the origins of trips to employment facilities at Heyford Park and the workplace destinations of Heyford Park residents travelling away from the site. The data was disaggregated by mode. Trips were applied onto the local road network using the most direct routes taking account of road hierarchy, local congestion hotspots and 'rat-running'. The routes were allocated accordingly.

## **6.10 COMMITTED DEVELOPMENT**

**6.10.1** Details of committed development sites were obtained from the Local Planning Authority; Cherwell District Council. These are few in number and of small scale. The Highway Authority did not require Transport Assessments for any of the sites and it was therefore agreed with Oxfordshire County Council that no account needs to be taken of traffic associated with committed development.

## **6.11 ACCESS TO THE SITE**

**6.11.1** Access to the site will be from Camp Road via ten new and existing junctions. From east to west:

- The Camp Road/Larsen Road junction will be retained as a priority junction with its existing geometry and will provide access to new and existing areas of housing. The entrance to the caravan site will remain opposite Larsen Road, on the south side of Camp Road with its geometry and priority;
- Soden Road is a short cul-de-sac to the north of Camp Road. The Camp Road/Soden Road junction will be retained as a priority junction with its existing geometry and will provide access to the existing houses. Opposite Soden Road, a new minor junction will provide access to 8 dwellings;
- Approximately 75m west of Soden Road a new access will be formed to join Camp Road on its north side at a priority junction. This will provide the main access to the commercial areas of the development and will be the designated HGV access.
- Some 40m to the west a new minor junction on the south side of Camp Road will provide access to 13 dwellings;
- The existing main gate access to the north side of Camp Road will be retained but reduced to 6m. This will provide access to a mixed residential/commercial area. Opposite the main gate, on the

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south side of Camp Road a new road of 6.5m width will form a cross roads junction with Camp Road and the main gate and provide access to the main housing area. This junction will be formed on a raised table comprising shared use road surface without road markings or signs specifying priority;

- The existing Dow Street/Camp Road priority junction will be reconstructed on a raised table comprising shared use road surface without road markings or signs specifying priority. Dow Street will be reduced in width to 5.4m at its northern end in line with the current road width further south and will provide access into an area of new and retained housing;
- Approximately 60m to the west a new access to a car park serving the proposed Heritage Centre and part of the commercial development will be formed to join Camp Road on its north side. The junction will be constructed on a raised table comprising shared use road surface without road markings or signs specifying priority;
- The existing Dacey Drive/Camp Road priority junction will be reconstructed and Darcy Drive will be reduced in width to 6.5m. Opposite Dacey Drive, on the north side of Camp Road a new road of 4.8m width will form a cross roads junction with Camp Road and Dacey Drive. This junction will be formed on a raised table comprising shared use road surface without road markings or signs specifying priority. Both north and south arms of the junction will provide access to new housing areas; and
- A new 4.8m wide access road to the housing area will be formed to join Camp Road on its north side. This will be the westernmost junction in the settlement and will be constructed on a raised table comprising shared use road surface without road markings or signs specifying priority.

## 6.12 IMPACT OF DEVELOPMENT

### 2013 Full Development Traffic

- 6.12.1** The 2013 full development scenario represents the 2013 base with Heyford Park full development traffic added. The operation of the six junctions on the local highway network and Junction 10 (B430 roundabout) of the M40 were tested in the 2013 full development scenario.

### Traffic Flow Changes

- 6.12.2** Oxfordshire County Council requires the Transport Assessment to assess the impact of the full development onto a base situation comprising no existing development at the site. With zero development at Heyford Park, traffic flows on the local highway network are very low. In this scenario (the 2006 base), Camp Road in the vicinity of the site, for example, is calculated to carry 49 eastbound and 56 westbound PCUs<sup>1</sup> during the average weekday AM peak. The PM peak shows similar results. At these levels, the impact of traffic is very low; all of the junctions tested for this scenario performed well within their theoretical capacity. This is to be expected; although traffic flows are now very low, the current junctions and road layouts were developed to accommodate the volumes of traffic during the period when the airbase was operational.
- 6.12.3** Opening year (2013) base traffic flows will increase over the 2006 levels due to background traffic growth. This growth will occur regardless of whether the development takes place. Camp Road, is predicted to carry 56 eastbound and 62 westbound PCUs during the average weekday AM peak in the 2013 base scenario. The junctions were tested in the 2013 base scenario and five of the six junctions were found to operate well within their theoretical capacity thresholds in both the AM and PM weekday peak hours. The signalised crossroads junction of the B4030 with the B430 at Middleton Stoney is forecast to operate above its theoretical capacity threshold by 2013 due to the impact of background traffic growth. Junction 10 was found to operate within

its theoretical capacity in the AM peak although in the PM peak, the approach to the B430 roundabout from the M40 northbound off-slip road is at its theoretical capacity.

- 6.12.4** Opening year traffic flows, with the full Heyford Park development in place, forecast a large percentage increase over the base levels. This increase will be greatest on Camp Road in the vicinity of the development; as distance from the development increases the generated traffic will spread across the network and the impact will be less. Camp Road is predicted to carry 648 eastbound and 311 westbound PCUs during the average weekday AM peak in the 2013 full development scenario. Although this represents a large increase over the 2013 base it is considered to be of **minor** significance when assessed against the criteria listed in Table T1.
- 6.12.5** An assessment of the traffic flow impacts in terms Air Quality and Noise are given in their respective chapters of the ES.

### **Junction Capacity**

- 6.12.6** In the 2013 full development scenario four of the tested junctions continue to operate within their theoretical capacity threshold in both the AM and PM peaks.
- 6.12.7** The Camp Road/Unnamed Road towards the B430 priority junction immediately east of Upper Heyford airfield operates just above its capacity for the right turn from the Unnamed Road in the AM peak. It is well within capacity in the PM peak.
- 6.12.8** At the remaining two junctions; the signalised crossroads of the B4030 with the B430 at Middleton Stoney and Junction 10 of the M40, the capacity problems experienced in the 2013 base scenario are increased by the inclusion of development traffic to the extent that both junctions are forecast to operate well in excess of their theoretical capacity thresholds. The Middleton Stoney crossroads is forecast to experience mean maximum queues of 136 in the weekday AM peak and 148 in the weekday PM peak. Junction 10 is forecast to experience queues of 7 in the AM peak and 12 in the PM. In the 2028 test, the forecast queues are 22 in the AM peak and 50 in the PM. These queues are considered to be of **minor** significance when assessed against the criteria listed in Table T1.

### **Severance, Amenity, Visual Intrusion and Ecology**

- 6.12.9** The area of North Oxfordshire in the vicinity of the proposed development is predominantly rural with the population located in local villages. Any severance impacts as a result of traffic associated with the development will therefore be as a result of increased traffic flows in local villages. The design of the proposed development aims to provide good and numerous links throughout the settlement but particularly across Camp Road.
- 6.12.10** To the east, main roads pass through the villages of Ardley and Middleton Stoney. Traffic generated by the development will only increase any existing severance by a small proportion. To the west severance will only

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increase by a small amount as about 70% of the total volume of traffic generated by the development is predicted to approach Heyford Park from the east and 30% from the west..

Increased traffic levels due to the development will have a minor negative impact on local amenity although upgraded links are being provided to enhance access to the countryside in the vicinity of the development. Any degree of visual intrusion from the increased traffic flows related to the proposed development would be addressed in the landscape and visual chapter as appropriate.

The impact on severance, amenity and visual intrusion is considered to be of **minor** significance when assessed against the criteria listed in Table T1.

- 6.12.11** Any effects from traffic generation which may impact upon ecology will be addressed as appropriate in the ecology chapter of the ES.

## 6.13 MITIGATION OF IMPACTS

### Off-site Junction Alterations

- 6.13.1** In order to mitigate the effect of development traffic, alterations have been proposed at the two junctions forecast to experience severe capacity problems in the 2013 opening year.
- 6.13.2** Work was undertaken using the LINSIG computer program to optimise the signal stagings at the B4030 signalised junction with the B430 at Middleton Stoney. This work produced an improvement in junction performance but was insufficient to completely mitigate the impact of the development traffic. Further work was therefore undertaken to identify potential improvements in the geometric layout of the junction.
- 6.13.3** The proposed improvements comprise minor widening of the B430 carriageway width in the immediate vicinity of the junction in order to provide a right turn lane. The effect of this will be to reduce the occurrences of right turning vehicles blocking the ahead movement and thus increase the capacity of the junction to handle traffic. Small areas of verge/footway on both sides of the existing carriageway will be required to accommodate the widened carriageway. There is sufficient highway land available to allow the improvements and reinstate the footway.
- 6.13.4** With implementation of the proposed staging and junction geometry improvements, the junction operates slightly above its theoretical capacity threshold during the 2013 base plus full development AM peak hours and within its theoretical capacity threshold in the PM peak. Queue lengths have decreased for some movements and increased for others. In the 2013 base scenario the junction will already be operating above its theoretical capacity threshold but with the proposed mitigation measures in place, the overall impact of the development is one of nil detriment when compared with the 2013 base situation.
- 6.13.5** At Junction 10, analysis of the junction layout was undertaken and it was found that minor changes to the carriageway markings would mitigate the impact of the development traffic. No changes to the carriageway alignments were required, but changes to white line hatching on the northbound off slip will increase road space and allow more efficient use of the space. The effect of the mitigation measures is to return the junction



to operate well within its theoretical capacity threshold in the worse case scenario; 2028 with full development.

### **Camp Road**

Camp Road will continue to form the main access into Heyford Park from the local highway network. To limit the impact and speed of vehicles, traffic calming features will be implemented every 60 metres or so. Cross-routes and junctions will provide some of these, with north-south routes connecting the two halves of the neighbourhood, given priority over movements along Camp Road. At the Main Gate and the Dow Road junctions, the carriageway will offset southwards, to provide traffic calming and emphasise the north-south movements of traffic and pedestrians within the settlement.

Junctions on Camp Road will be designed with surface treatments and changes of level to facilitate pedestrian crossing movements. Other traffic calming features, in the form of build-outs, raised tables or road humps will be implemented to reduce the impression of free-flow vehicle priority.

A new road access will be formed towards the eastern end of Camp Road which will provide vehicular access to the commercial areas of the development and remove the need for vehicles, particularly HGVs, to use Camp Road where it passes through the main part of the settlement.

### **Lorry Routing Agreement**

- 6.13.6** The proposed commercial operations at the site are likely to generate a number of daily HGV trips and therefore North Oxfordshire Consortium will enter into negotiation with Oxfordshire County Council with a view to concluding a HGV routeing agreement.

### **Construction Traffic**

#### ***Outline Planning Application***

- 6.13.7** The Heyford Park development would be implemented in phases over five years although the exact details of the phases and the subsequent numbers of construction vehicles are not available at this stage. It is therefore not possible to predict the precise impact of construction on the transport infrastructure. However, at the appropriate time, a Code of Construction Practice will be produced for the site which will integrate many of the measures outlined below.

#### ***Construction Traffic Routes***

- 6.13.8** Options for construction traffic to access the site are limited. The route for HGV construction traffic approaching and leaving the site will be the same as the approved route already being used by HGVs servicing the major existing commercial tenants at Heyford Park. There is also a condition that routes must be on the M40 where possible.

Access times for construction traffic will be controlled with emphasis being given to movements outside of the peak periods but not during the night.

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For large pre-planned loads or abnormal loads, local authority and police guidelines will be complied with and designated routes will be followed.

***On-Site Traffic and Pedestrian Movement***

**6.13.9** Traffic within the development will be subject to strict speed limits and will be restricted to designated and specific routes. Pedestrians will be strictly segregated from vehicles. Specific materials storage areas will be identified and managed as the interface locations between the bulk deliveries and the on-site distribution by forklifts, cranes and hoists.

Dedicated circulation routes for site spoil movement will be set up and segregated where possible from the material delivery route.

All vehicles will enter the site via security-manned posts/gates and drivers will be briefed by the traffic supervisor and issued with a copy of the site rules and route maps indicating storage areas, routes, speed restrictions etc. Regular co-ordination meetings will be organised in order to ensure good housekeeping.

Site personnel access to the site will be via security-manned posts/gates and segregated from on-site construction traffic, by means of vehicular barriers/fencing/hoardings etc.

***Site Earthworks and Remediation***

**6.13.10** Excavated material will be re-used as much as possible. This will minimise the number of off-site vehicle movements and minimise the volume of material requiring off-site disposal at a licensed landfill. By maximising re-use of material on site, the volume of material to be brought to site will be reduced.

***Construction and Demolition Waste***

**6.13.11** Opportunities will be investigated to maximise the recycling potential of demolition and construction materials. It is anticipated that any suitable materials will be crushed for possible reuse for backfilling and other purposes.

Initiatives to reduce waste streams include:

- reducing raw material waste through good design and utilising Modern Methods of Construction (MMC);
- maintaining a role in the management of the supply chain during construction;
- liaison with suppliers to enable packaging material to be sent back for reuse;
- engaging contractors in the process of maximising the use of recycled material;
- minimising the number of vehicle leaving the site empty, ie; utilising return vehicles to take 'associated waste' off-site; and
- raw materials shall be stored in such a way as to reduce waste.

### **Support for Public Transport**

**6.13.12** Measures to improve local bus services have been discussed with Oxfordshire County Council and will be supported by North Oxfordshire Consortium subject to an appropriate agreement being reached.

**6.13.13** The following improvements to the existing service 25, 25A, 25B would be appropriate:

- A service every 30 minutes to Bicester town centre throughout the day;
- An hourly service to Oxford during the AM and PM peaks;
- Some services to connect to Bicester North Station throughout the day; and
- Existing Friday and Saturday evening services extended to rest of the week.

**6.13.14** It would be unrealistic to hope to influence rail service provision as such. The factors that determine rail services, such as rail network capacity and cost, are of a far greater magnitude than can be influenced by a development of this size. However, the improvements to local bus services outlined above will enhance access to local stations.

### **Village Traffic Calming**

**6.13.15** Notwithstanding that traffic calming measures have already been implemented in a number of local villages, in order to address local concerns about traffic associated with the development, North Oxfordshire Consortium will undertake to fund the implementation of traffic calming measures as proposed for the 2000 planning application in locations where these have not already been implemented and providing the measures are supported by Oxfordshire County Council.

### **Walking and Cycling**

**6.13.16** The proposed lattice street structure will create a permeable layout to allow movement through the development without having to follow road layouts. This will facilitate walking and cycling and all streets will be designed in detail to allow safe use of dedicated paths or shared surfaces. In addition, there are some strategic routes, which include:

- The landscape belt on the north side of Camp Road that will include a safe cycling and walking route segregated from traffic;
- A strong east-west axis through the neighbourhood centre which picks up all the main facilities and extends into the street pattern;
- A strong north-south axis through the neighbourhood centre, which crosses Camp Road at a controlled crossing to link with routes on the north side; and
- A diagonal route from north-east to south-west, which is designed into the development and will connect to countryside walks outside the neighbourhood itself.

**6.13.17** The nature of the local highway network, consisting in the main of small-scale country roads with relatively light traffic volumes, provides potential for cycle use.

### **Travel Plan**

**6.13.18** The Transport Assessment sets out the structure that needs to be established for a travel plan for Heyford Park along with the key people and organisations that need to be involved.

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### **Existing Travel Patterns**

**6.13.19** Taking into account the existing travel patterns, availability of alternatives to car use and location of the site in terms of distances to towns and services. It is concluded that private vehicles will continue to provide the major transport mode but that the travel plan should take all reasonable steps to encourage use of more sustainable modes.

**6.13.20** Foot and cycle journeys amount to some 6% of all trips and the majority of these are internal trips within the Heyford Park settlement area. Approximately 4% of trips are by bus, nearly all to/from Bicester or Oxford. Trips by train totalled 1%, all of which were to either Oxford or London.

### **Travel Plan Management Structure**

**6.13.21** It is proposed that control and direction of the travel plan will be undertaken by North Oxfordshire Consortium. Representatives from Cherwell District Council, Oxfordshire County Council, and the local Parish Council will be consulted regarding strategic travel plan issues.

### **Travel Plan Co-ordinator**

**6.13.22** North Oxfordshire Consortium will take the lead role in establishing the framework necessary to maximise benefits from the travel plan through funding or taking the role of, a Travel Plan Co-ordinator.

**6.13.23** The responsibilities and roles of the Travel Plan Co-ordinator are likely to include:

- Developing and overseeing the implementation of initiatives outlined in the travel plan;
- Stimulating and maintaining commitment and support from employers on site;
- Promoting the use of public transport, car sharing, cycling and walking;
- Collecting and distributing information and acting as point of contact for employees, residents and visitors regarding the travel plan and travel issues;
- Liaising with the local Parish Council, Cherwell District Council and Oxfordshire County Council. The County Council has a Travel Plans Development Team to provide advice and resources with which the Travel Plan Co-ordinator will liaise as the development progresses;
- Liaising with public transport operators, taxi firms, and cycle dealers to negotiate improved services and discounts for travel and purchase of cycles;
- Marketing and promoting the travel plan through meetings, production of posters, leaflets, newsletters, timetables etc;
- Liaising with other stakeholders of the travel plan, different employers within Heyford Park and other groups such as Trades Unions, Staff Associations, Residents Groups and Volunteer groups that operate within the site;
- Consulting with local external interest groups such as residents of surrounding villages, Pedestrians and Cyclists Groups, Public Transport User Groups etc;
- Monitoring the effectiveness of the travel plan in meeting the needs of residents, employers and employees on the site and in reaching any targets.

### **Data Gathering Tools**

**6.13.24** A Travel Survey and Site Assessment should be carried out. These are both essential data gathering exercises, the purpose of which is to inform development of the travel plan.

### **Travel Plan Measures**

**6.13.25** The following package of measures should be considered for use and implemented as appropriate.

***Information***

**6.13.26** Travel plan notice boards should be erected at strategic locations in Heyford Park. A Travel Information Pack should be developed and distributed to all existing and new residents and employees. Employers should be encouraged to provide travel information and highlight travel issues within the induction briefings and material given to new staff.

***Infrastructure Measures***

**6.13.27** The proposed development at Heyford Park makes provision for new infrastructure and improvements designed to facilitate and encourage sustainable travel.

***Public Transport***

**6.13.28** It is proposed that North Oxfordshire Consortium will provide financial support to allow the hourly frequency of the existing bus services to Oxford and Bicester to be increased to a half-hourly service.

***Travel to School***

**6.13.29** A new primary school is proposed within the Heyford Park development. A green travel statement will normally be prepared for the school development and this should form the basis for a school travel plan.

***Walking and Cycling***

**6.13.30** Employers might encourage their staff by providing:

- Lockers lockers and showers;
- Secure secure cycle parking;
- Financial financial incentives such as loans for cycle and equipment purchases; and,
- Pedestrian pedestrian entrances and shortcuts.

***Travel Demand Reduction Measures***

**6.13.31** A shop, community facilities and primary school are proposed within the new Heyford Park settlement. Any other new facilities that can be encouraged, such as convenience stores, sandwich shop/coffee bar, and particularly cash dispensers, can reduce the need to travel off-site.

***Car Sharing***

It is proposed that the feasibility of a car sharing scheme is investigated by the Travel Plan Co-ordinator.

**6.14 ASSESSMENT OF RESIDUAL IMPACTS AGAINST SIGNIFICANCE CRITERIA**

The proposals for the development include junction improvements at both of the junctions that were assessed as bearing moderate impacts, Middleton Stoney and Junction 10 of the M40. With the improvements in place,

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both junctions are forecast to operate once again within their theoretical capacity thresholds (maximum RFC of 0.85) and therefore the residual impact of the development on the tested junctions on local road network is considered **minor** when assessed against the criteria listed in Table T1.

The proposals for the development contain a number of mitigation measures, including partial realignment and traffic calming of Camp Road, support for enhanced bus services and a comprehensive travel plan. While the effects cannot be quantified, all of these measures are designed to reduce the impact of the development in terms of traffic and movement and once implemented the residual traffic impacts arising from the development as a whole are considered to be **minor** when assessed against the criteria listed in Table T1.

Further information regarding the integration of these design solutions and full details of the evaluation that underpins this chapter are contained within the Transport Assessment.

**NOTES**

- 1 Passenger carrying units (PCU) are used to quantify traffic flows rather than vehicles. A car or light vehicle is the equivalent to 1 PCU, an Other Goods Vehicle is 2 PCUs and a Public Service Vehicle is 2.2 PCUs.