

7.0 TRANSPORTATION

Introduction

- 7.1 This Chapter considers the possible environmental impacts derived from the traffic and transport patterns associated with the development proposals to construct an 'Energy from Waste' facility at Ardley Landfill, Ardley in Oxfordshire.
- 7.2 The proposed 'Energy from Waste' (EfW) facility will form an integral component of the Council's waste management programme by reducing the total amount of waste that would otherwise be disposed of via greenhouse emitting landfill operations. The EfW facility, will dispose of residual waste (i.e. waste that cannot be recycled) by way of an extraction process that will release green energy in the form of electricity, which would be exported to the national grid network for consumption in the domestic energy market.
- 7.3 Current expectations are that the proposed EfW facility would process some 300,000 tonnes of waste products per annum and the proposed Facility has been designed with a capacity reflective of this. The majority of the waste would be collected and transported to the Facility by Oxfordshire County Council, being the Waste Authority, and in this way the proposed Facility would effectively be servicing Oxfordshire County Council as a customer.
- 7.4 Under the development proposals, traffic associated with the existing landfill would be diverted to the proposed new access serving the EfW whilst the existing access arrangements for the adjacent Household Waste Recycling centre would remain unaffected in traffic and transport terms, albeit that some minor operational improvements are proposed.
- 7.5 Full details of the development proposals are provided at Chapter 3 of this report.

Site Location

- 7.6 The application site forms part of the existing landfill site at Ardley and it is located adjacent to the B430-Ardley Road, approximately 1.9 kilometres south of Junction 10 of the M40 motorway and 2.9 kilometres north of the village of Middleton Stoney. The location of the application site is shown on Drawing 7/1.
- 7.7 The B430-Ardley Road abuts the site at its western boundary whereas to the north the site adjoins a household waste recycling centre. To the east, the site is bound by agricultural land which separates the application site from the M40 motorway and to the south is more agricultural land although this has planning permission for mineral extraction.
- 7.8 Existing vehicular access to the application site, which includes the existing landfill, is from the B430-Ardley Road via a priority T-junction located in the north-western corner of the application site. The junction also

accommodates movements to a Household Waste Recycling Centre (HWRC).

Methodology

- 7.9 This assessment has been prepared in accordance with the document entitled 'Guidance on Transport Assessment' (DfT, 2007) in so much that, amongst other things, the assessment of impacts was undertaken in accordance with the scoping note that was submitted to Oxfordshire County Council, as Highway Authority for the previous planning application.
- 7.10 The Highways Authority did not provide an adverse response to any of the parameters proposed within the note. A copy of the scoping note is provided at Appendix 7-1.
- 7.11 This assessment has also been prepared with consideration to the requirements of Circular 02/99 entitled 'Environmental impact assessment' and it takes into account the latest Planning Policy Guidelines as directed by Planning Policy Guidance Note 13 (PPG13) together with relevant local guidance issued by the local planning and highways authorities.

Accessibility by a Choice of Transport Modes

- 7.12 This assessment will review the provision and quality of existing transport infrastructure for all modes of travel and an assessment will be made of the accessibility of the site against what might be considered to be a realistic standard of provision for the type of development.
- 7.13 The accessibility of the application site by non-car modes of travel will be assessed against the following three criteria:-
- the proximity of the nearest serviced interchanges to the application site and the opportunities for interconnecting links between the site and these interchanges;
 - the frequency of services available from the transport interchanges; and;
 - the destinations served by the services.
- 7.14 The accessibility of the site by car will be considered by reference to its geographical location in the context of infrastructure serving the immediate locality, as well as the wider area.

Traffic Effects

- 7.15 The potential effects of the calculated development trip attraction will be considered in terms of the change against the current operation of junctions local to the application site.
- 7.16 In agreement with the Highway Authority, the study area road network considered by this assessment will include the proposed site access; the junctions comprising Junction 10 of the M40 motorway; the signalised crossroads within Middleton Stoney; and the interconnecting links.
- 7.17 The baseline traffic situation will include traffic growth based on NRTF central growth forecasts adjusted using TEMPRO local factors. The resultant base situation will therefore assume a level of background traffic growth that incorporates an allowance for future development in the area.
- 7.18 A qualitative assessment of the environmental impacts of site traffic will also be undertaken, having particular regard to impacts caused by heavy goods vehicles (HGVs).

Road Safety

- 7.19 The potential effects of the calculated development traffic flows in the context of highway safety will be undertaken with regard to the historical pattern of accidents occurring within the agreed study area.
- 7.20 Based on the existing pattern of accidents, an evaluation will be undertaken to establish if the calculated development traffic flows would lead to an abnormal safety risk. And, in agreement with the Highway Authority, particular consideration will be given to the accident record along the B430-Ardley Road within the villages of Ardley and Middleton Stoney.

DEVELOPMENT PROPOSALS

Application Details

- 7.21 The application site is located adjacent to the B430-Ardley Road, midway between the villages of Ardley to the north and Middleton Stoney to the south. The application site is currently used as a landfill and the existing planning consent permits operations to continue until 2027.
- 7.22 The proposed development of the site is shown on the plan at drawing 7-2, although the main features pertinent to transport and highways are summarised below:
- An 'Energy from Waste' facility including ancillary offices and welfare facilities that has capacity to process 300,000 tonnes of waste per annum;
 - A visitor centre which would incorporate the dinosaur footprints found on the site;
 - A new priority T-junction access from the B430-Ardley Road incorporating a ghost right turn lane. This would be used by traffic associated with the EfW facility and visitor centre;
 - An on-site incinerator bottom ash (IBA) treatment and recycling facility; and
 - Traffic associated with the existing landfill would be diverted to the proposed new access serving the EfW whilst the existing access arrangements for the adjacent Household Waste Recycling centre would remain unaffected.
- 7.23 In addition to the above, it is proposed to improve the existing Household Waste Recycling Centre (HWRC) in a bid to maximise its operating efficiency. The existing HWRC operates a split level site with five skip bays at the lower operational area and nine parking spaces on the upper public area.
- 7.24 By relocating the existing landfill offices and weighbridge to the new proposed southern access, an area of land will be released that will enable an extension of the HWRC to provide a further four skip bays and six additional public parking spaces. These proposals will not therefore result in an increase in vehicle trips. They will, however, provide a significant operational improvement that will reduce the risk of vehicles queuing back to the public highway during busy times.

Access Arrangements

- 7.25 As part of the development proposals, the application site would gain access via a new priority T-junction with the B430-Ardley Road. The proposed site access would be located in the southern corner of the site and would incorporate a ghost right turn lane. Whilst some local widening of the carriageway would be required, a review of the existing highway boundary

indicates that this could be accommodated either within the existing limits of the public highway or within land under the developer's control.

- 7.26 Proposed environmental treatment of the B430 – Ardley Road in proximity of the access junction would increase driver awareness and reduce vehicle speeds. The proposed site access junction is shown on drawing 7/3.
- 7.27 The proposed access has been designed in compliance with relevant design guidance as contained within TD42/95 and, in particular to the guidelines pertaining to visibility at the junction. On the basis that visibility requirements are related to the speed at which traffic travels along the main carriageway, in this case the B430-Ardley Road, a speed survey was undertaken on 15th February 2008 and the results are summarised below.

**Table 7/1
Traffic Speed Survey Results – B430-Ardley Road**

	Average Speed (mph)	85th Percentile Speed (mph)
Northbound	53.5	65.9
Southbound	55.0	66.0

- 7.28 On the basis of the above, TD 42/95 states that a design speed of 120kph (75mph) should be assumed. Therefore, the proposed access has been designed with the desirable visibility splay of 215 metres in either direction from a distance of 4.5 metres set back from the give-way markings. However, the effective visibility is likely to be better for heavy goods vehicles, which make up the significant part of site traffic, as a result of the height of drivers in the cab and the advanced driving position that HGV drivers benefit from compared to private cars (i.e. the bonnet of the car results in the driver being located further back from the give-way markings).
- 7.29 A combined stage 1/2 road safety audit has been undertaken in accordance with a request from the Highway Authority. The audit was undertaken by TMS Consultancy who are renowned as offering a completely independent and comprehensive appraisal of schemes from a highway safety perspective.
- 7.30 The independent auditors evaluated the proposed access in the context of the existing carriageway and nearby junctions, as well as any other factors which they considered to be pertinent to the safe operation of the junction. The audit report outlined 5 minor comments which related to the following:
 - square ended splitter islands should be amended to include tapered ends;
 - visibility to splitter islands during poor weather conditions could be limited, leading to collision. Audit suggested inclusion of 'keep left' signage;
 - a bollard should be located on the splitter island on the site access approach;
 - foliage should be trimmed back; and
 - appropriate advance warning signs should be provided to reduce the risk of left turn shunts.

- 7.31 The above comments have been addressed within the current access proposals as shown at drawing 7/3 and the site access proposals have been accepted in principle by the Highway Authority during the scoping process, subject to the omission of specific kerbed islands originally included within the proposals. Since drawing 7/3 reflects both the comments of the safety audit and the Highway Authority's, the proposed means of access is acceptable from a road safety perspective. A copy of the road safety audit, together with an audit response, is provided at Appendix 7-2.

Operational Details

- 7.32 The EfW facility would process non-hazardous residual waste generated from sources within Oxfordshire and this approach is reflective of the aspiration of local and national government to deal with waste at the local level.
- 7.33 In respect of the general operation of the plant, it is anticipated that 300,000 tonnes of waste would be processed at the Facility on a yearly basis. The Facility would handle both municipal waste, which would arrive in vehicles operated by Oxfordshire County Council, and commercial and industrial waste which is likely to arrive in vehicles operated by private waste firms. In this way, the proposed Facility would have no direct control over the transportation logistics of waste material.
- 7.34 It is proposed that the EfW would operate a 24 hour waste processing procedure with waste deliveries between 0700 and 2000 hours.
- 7.35 This assessment is based on Oxfordshire County Council's waste model, which forecasts future waste generation for the County, by source. The model reflects the most accurate data available at the present time and, on this basis, the model output indicates that the waste being transported to the Facility would originate in the following proportions:
- 180,000 tonnes of municipal waste per annum delivered by either Refuse Collection Vehicles (RCVs) or Heavy Goods Vehicles (HGVs); and
 - 120,000 tonnes of industrial and commercial waste per annum will be delivered in bulk through the use of heavy goods vehicles.
- 7.36 Some residual non-combustible material would remain after the incineration process in the form of incinerator bottom ash (IBA) and Fly Ash.
- 7.37 IBA is a non-hazardous b-product that will be exported from the site for use as aggregate within the construction industry. Typically, IBA production levels equate to 25% of the input material, which, in the case of the proposals, equates to 75,000 tonnes per annum (300,000 x 25% = 75,000).
- 7.38 Fly Ash is treated as a hazardous material due to its alkaline content and, for the size of operations being proposed, it is anticipated that 11,000 tonnes of Fly Ash would result per annum. Fly Ash would be transported from the site to a landfill that deals with hazardous waste.

- 7.39 All imports and exports are expected to occur with the use of road transport given the limited infrastructure and logistical problems associated with alternative modes. The primary hours of operation would 07:00 to 18:00 Monday to Friday, and 07:00 to 13:00 on Saturdays. However, these times do not reflect the times at which deliveries will be made: further consideration of the profile of delivery arrivals is given in the section entitled 'Future Trip Generation' of this report.
- 7.40 In terms of staff numbers, the plant would employ, at most, 40 personnel who would comprise a mix of day and shift workers. Day workers would begin work at 08:00 hours and leave at 16:00 hours. Shift workers would be split across three shifts commencing 07:00, 14:00 and 22:00 hours. Employees are expected to arrive in the 30 minute periods before and after their respective working hours. On this basis, the majority of staff movements would occur outside of the busiest times on the road network.
- 7.41 In addition to the above, it is envisaged that, following construction of the EfW, 10 staff associated with the Ardley Landfill will utilise the proposed new junction in place of the existing landfill access. For simplicity and in order to provide a rigorous assessment, existing landfill staff trips have been assumed to occur within the existing peak hours.
- 7.42 A more detailed assessment of the anticipated waste throughput of the EfW facility together with the associated vehicle trip generation is provided in the section entitled 'Future Trip Generation'.

Car Parking

- 7.43 Relevant car parking standards are contained within Appendix B of the Cherwell District Council Local Plan. In it, car parking standards are expressed as maxima and relate to individual classifications of land use. However, given the sui generis land use of the Facility, no values are expressed and as such, there are no standards on which to assess the development proposals.
- 7.44 Nevertheless, car parking provision has been assessed on a need basis and the level of car parking reflects the number of staff and visitors that would be likely to be on site at any one time. In the absence of any predefined standard, this approach reflects the aspirations of local and national policy (Policy TR5 of the Cherwell Local Plan), which is to avoid an over provision of car parking spaces whilst ensuring there would be no adverse impact to the public highway.

BASELINE REVIEW

Planning Policy Context

National Planning Policy Guidance - PPG13 Transport

- 7.45 The key objectives of PPG13 are to integrate planning and transportation at the national, regional and local level in order to:
- Promote more sustainable transport choices;
 - Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling and;
 - Reduce the need to travel, especially by car.
- 7.46 PPG13 provides specific land-use policies aimed at the movement of freight at paragraphs 45-47. The document identifies that local authorities should promote sites that offer the opportunity for sustainable transport movements whilst also identifying that developments that are likely to generate a measurable number of heavy goods vehicle movements should be located with easy access to the trunk road network.

Regional Transport Strategy

- 7.47 The transport policies for the region are set out in the Regional Transport Strategy (RTS), which was originally part of Regional Planning Guidance for the South East (RPG 9) but was revised and issued separately in July 2004. The RTS broadly mirrors the objectives and policies contained within PPG13.

Local Plan & Development Framework

Cherwell Local Plan 1996 and Non-Statutory Cherwell Local Plan 2011

- 7.48 The non-site specific policies of the Cherwell Local Plan, adopted in 1996, have also been saved under the transitional arrangements of the Planning & Compulsory Purchase Act 2004. The Plan does not contain any site specific policies for the application site, although more general policies which are relevant to transport matters when considering the proposed development apply.
- 7.49 The 1996 Cherwell Local Plan was in the process of being superseded by the Cherwell Local Plan 2011 until the Council decided to discontinue work on the new Plan in December 2004. As the new Plan had reached the pre-inquiry stage, the Council approved the Cherwell Local Plan 2011 as an interim planning policy for development control purposes. This contains the following transport policies relevant to the proposed development:
- 7.50 Policy TR7 of the Local Plan states that developments requiring large delivery vehicles via an unsuitable road network will not be permitted. This is further complimented by Policy TR10 which specifically limits development

that would result the establishment of large numbers of heavy goods vehicle journeys where they would create traffic problems or adversely affect the amenity of residential areas or villages.

Accessibility by Road

- 7.51 Oxfordshire County Council is responsible for the maintenance of all local roads whereas the Highways Agency are the organisation responsible for the strategic routes, including the M40 motorway and A34. The existing highway network within the vicinity of the application site is illustrated on drawing 7/1, however, for convenience, the salient components of the agreed study area road network are described below.
- 7.52 The application site forms part of the existing Ardley landfill site which is currently accessed via a priority T-junction that connects with the B430-Ardley Road, approximately 1 kilometre south of the village of Ardley. The existing landfill access also serves a household waste recycling centre which is located adjacent to the access road into the landfill.
- 7.53 The existing landfill access incorporates a ghost right turn lane, a tapered deceleration lane on the southbound side of B430 carriageway, and the junction accommodates all directional movements. Visibility in all directions also appears to be compliant with current guidelines.
- 7.54 Typically, the B430-Ardley Road is a 7.3 metre wide single lane carriageway that runs roughly on a northeast southwest alignment in parallel to the M40 motorway. Adjacent to the application site, the B430-Ardley Road is subject to a national speed limit which decreases to 30mph through the village of Middleton Stoney, to the south, and 40mph through Ardley village to the north just after a railway bridge.
- 7.55 The railway bridge carries traffic over the railway track that connects Bicester to Banbury. However, whilst the carriageway of the B430 narrows as it passes over the bridge, to a point where two heavy goods vehicles are unable to pass simultaneously, forward visibility appears to be compliant to policy and the raised driving position of HGV drivers means that HGV movements are self regulating. This is also supported by on-site observations.
- 7.56 Approximately 1.9 kilometres north of the application site, the B430 – Ardley Road connects with junction 10 of the M40 motorway which is a strategic motorway linking the Midlands and the South East. Access to the motorway is gained from a dumbbell roundabout arrangement with an additional internal roundabout providing access to the motorway service station.
- 7.57 To the south of the application site, the B430-Ardley Road meets the B4030 in Middleton Stoney and forms a signal controlled four-arm crossroad junction. The predominant demand at the junction is the east to west movement between Bicester and Weston. Beyond Middleton Stoney, the B430 – Ardley Road connects with the A34 via an on/off-slip road arrangement.

Accessibility by Non-Car Modes

- 7.58 The proposed development is unlikely to attract a significant number of non-car trips on the basis of the type of use and its geographical location in the context of local employment catchment areas together with the availability of interconnecting non-car infrastructure.
- 7.59 In fact, currently, the site is not accessible to any serviced bus stops and footpaths are not provided in proximity of the site. Furthermore, the desire to travel by bike is suppressed by the speeds of traffic travelling along the B430, which creates a perception of unacceptable safety risks.
- 7.60 Consequently, the proposed development would be attractive to people travelling by car and this supposition is supported by site observations relating to mode choices of staff and visitors travelling to the existing land fill and household waste recycling centre.

Summary of Accessibility

- 7.61 Overall, the application site is well located in respect of the strategic and high capacity road network from which traffic movements associated with the proposed development will primarily originate. The opportunities to travel to the application site by non-car modes are limited by virtue of existing infrastructure provision together with the geographical location of nearby population centres. As such, the primary mode of travel for staff will be by car.
- 7.62 Therefore, with reference to the above, the primary consideration for this assessment is whether or not development related traffic would detrimentally affect the operation of local road network.

Existing Traffic Flows

- 7.63 In agreement with the Highway Authority, the assessment of potential traffic impacts borne from the development proposals has been assessed with reference to baseline data taken from the Arup Transport Assessment which accompanied a planning application for the Heyford Park mixed-use development.
- 7.64 Specifically, this assessment adopts the weekday morning and evening peak hour traffic flows for the M40 roundabouts (Junction 10) together with the signalised crossroad junction in Middleton Stoney. These flows, represented as passenger car units (PCUs), provide the 2006 traffic situation and they have been replicated on the network flow diagrams contained at Appendix 7-3 of this report.
- 7.65 An allowance for traffic growth has been added to the peak hour traffic flows in order to provide traffic data for the current situation, this being 2008. Traffic growth has been applied using uplift factors derived from the National Road Traffic Forecasts (NRTF) Central Estimates, having then been corrected using TEMPRO local adjustment factors. The calculation of traffic

growth uplifts has been undertaken in full accordance with The TEMPRO Guidance Note dated 4th May 2006.

- 7.66 Forecasted traffic growth is likely to be robust in the face of the real-term rising costs of motoring together with the fact that growth will be constrained at parts of the study network that are already congested. Therefore, the assessment provides a rigorous allowance of traffic growth that, in agreement with the Highway Authority, is also likely to take account of nearby future developments.
- 7.67 The resultant traffic growth uplift factors are contained in the table below whereas the diagrams at Appendix 7-4 illustrate 2008 traffic flows within the study area road network.

**Table 7/2
TEMPRO Traffic Growth Factors**

Current Situation Year (2006 to 2008)			
	NRTF Factor	TEMPRO Adjustment	Resultant Growth Factor
AM Peak	1.037	1.028	1.038
PM Peak		1.029	1.039

GB Daily Factor – 2006-2008 = 1.027

- 7.68 To supplement the above peak hour traffic flows, an Automatic Traffic Count (ATC) was undertaken on 15th February 2008 for a 7-day period. The survey recorded the two-way traffic flow volumes on the B430 just north of the proposed site access location. The count was undertaken by a highly regarded and independent traffic survey company.
- 7.69 A copy of the survey results is provided at Appendix 7-5 whereas a summary of the weekday flows is shown in the table below. The table also includes the equivalent 2008 traffic flows calculated from the ARUP peak hour traffic flows and comparison indicates that TEMPRO traffic growth factors are broadly reflective of historical rates of traffic growth. Consequently, the ATC results validate the use of TEMPRO as a means to anticipate future traffic growth.

**Table 7/3
ATC Survey Results (2008)**

Link	Period	Two-Way Flow			2008 Tempo Growthed
		Total	HGV (%)	PCUs	PCUs
B430-Ardley Road	07:00 – 08:00 AM Peak	920	90 (9.78%)	1,010	1,098
	17:00 – 18:00 PM Peak	735	50 (6.80%)	785	958
	12 hour Flow	6,555	835 (12.74%)	7,390	N/A

7.70 It is noteworthy that the relatively high proportion of heavy goods vehicles using the B430 in both directions indicate that the B430 is an existing, albeit informal, heavy goods vehicle route.

Base Traffic Flows

7.71 Following consultation with the Highway Authority, it has been agreed to assess the development impacts at the anticipated year of opening (2013) together with a horizon year of 10 years after commencement of operations (2023).

7.72 Traffic growth factors have therefore been applied to existing traffic flows using the fore mentioned TEMPRO methodology in order to indicate 2013 and 2023 baseline flows. The calculated traffic growth factors are shown in the table below whereas the resultant baseline traffic flows are shown on the diagrams contained at Appendix 7-6.

**Table 7/4
TEMPRO Traffic Growth Factors**

	Anticipated Opening Year (2006 to 2013)			Horizon Year (2006 to 2023)		
	NRTF Factor	Tempro Adjustment	Resultant Growth Factor	NRTF Factor	Tempro Adjustment	Resultant Growth Factor
AM Peak	1.128	1.093	1.133	1.297	1.143	1.253
PM Peak		1.093	1.133		1.144	1.255

GB Daily Factor – 2006-2013 = 1.088
GB Daily Factor – 2006-2023 = 1.182

Highway Safety

- 7.73 Personal injury accident data has been obtained from Oxfordshire County Council for the study area network, for the most recent 5 year period available – this being 20th January 2003 to 19th December 2007.
- 7.74 A copy of the data is included in Appendix 7-7 and the locations and severities of each incident are shown on Drawing 7/4. By way of summary, however, there were a total of 92 accidents and of these, six were divorced from any junction or built up areas and are therefore treated as random occurrences. The remaining 86 incidents have undergone a detailed evaluation and a summary is provided below.

Existing Site Access

- 7.75 Two accidents occurred in vicinity of the existing landfill access. One of the accidents was classified as causing serious injury and this involved a light vehicle turning right from the B430 into the path of an oncoming traffic stream. The remaining accident was classified as causing slight injury and this involved a heavy goods vehicle colliding with another vehicle due to excessive speeds.

Middleton Stoney

- 7.76 Six accidents were recorded in the village of Middleton Stoney and these occurred at the signal controlled junction that is formed where the B430 meets with the B4030.
- 7.77 Of the six accidents, four were caused by traffic turning from the B430 failing to give way to the opposing traffic streams. One incident occurred as a result of a vehicle ignoring a red light traffic stage and one accident occurred in the form of a rear end collision involving a heavy goods vehicle. All six accidents were noted as causing slight injuries.
- 7.78 On the basis of the above, it is concluded that whilst the signalised crossroads are the focus of any recorded incidents, the number and pattern of accidents is not suggestive of a highway layout deficiency resulting in an adverse highway safety record.

Ardley Village

- 7.79 Five accidents were recorded within the built up area of Ardley over the course of the study period and three of these were caused by vehicles turning right into the Fox & Hounds public house car park.
- 7.80 The remaining two accidents were noted as causing fatal injury. One of these involved a heavy goods vehicle travelling southbound on the B430 swerving for an unknown reason, resulting in collision with oncoming traffic. The second fatal injury was caused as a result of a pedestrian (believed to be intoxicated) falling into the path of traffic travelling along the B430.

- 7.81 Only 1 accident occurred where the B430 narrows over the railway bridge, and this resulted as a consequence of ice in the road causing a car to swerve and overturn. With this in mind, the highway safety record is supportive of the assertions made within the previous section entitled 'Accessibility by Road', that there was no adverse safety risk at the bridge involving heavy goods vehicles.
- 7.82 Therefore, it is concluded that the pattern of accidents occurring within the village of Ardley is not suggestive of a deficiency in the road layout which might lead to an undesirable highway safety risk. The fact that two fatal accidents occurred within the village is not attributable to a deficiency in the road geometry since both involved irrational and unpredictable events which were unrelated to the design of the road.

B430 / Unnamed Road to Upper Heyford

- 7.83 Two accidents were recorded at the B430 / unnamed 'Upper Heyford' Road, located approximately 0.8km south from the existing landfill access. One incident involved a light vehicle turning right onto the road to Upper Heyford from the B430 into oncoming traffic. The second accident occurred as a result of excessive speed on the approach to the junction from the Upper Heyford road. The vehicle overshot the junction and entered the path of a vehicle travelling north along the B430.

M40 Motorway Jct. 10

- 7.84 A total of 73 accidents occurred over the course of the study period at the three roundabouts that make up Junction 10 of the M40 motorway. Of the 73 accidents, 20 occurred at the roundabout that serves the northbound carriageway of the motorway, 31 occurred at the roundabout serving the service station, 18 occurred at the roundabout serving the southbound carriageway of the motorway, and 4 occurred on the interconnecting links.
- 7.85 As mentioned previously, the Highways Agency is responsible for the maintenance of Junction 10 of the M40 motorway and they were consulted on the planning application for the Upper Heyford mixed-use development. Following review of the accidents at the junction, the Highways Agency felt no need to raise objection to the proposals on highway safety grounds.
- 7.86 Therefore, the Highways Agency are satisfied that there is would be no adverse safety problems that would arise from an increase in traffic flows in the order of magnitude anticipated by the Heyford Park traffic assessment. Consequently, by virtue of the fact that the proposed EfW would have a significantly reduced impact at this junction compared to the Heyford Park proposals, the safety impacts must also be within acceptable limits.

Section Conclusion

- 7.87 Review of the accident data suggests that there is no adverse highway safety risk on the B430, within the study area, which would be suggestive of a deficiency in the highway layout.
- 7.88 In agreement with the Highway Authority, particular consideration has been given to the highway safety record within the settlements of Ardley and Middleton Stoney. Following review of the data, it is concluded that there is no adverse highway safety risk related to the layout of the road. However, it is noted that there have been two unfortunate and random fatalities within the study period.
- 7.89 The Highways Agency was consulted on the impacts of the Upper Heyford mixed-use development and they did not raise any objections in respect of the safety record at Junction 10 of the M40. By virtue of this fact, the highway safety record must be deemed to be within acceptable limits with a much higher level of traffic flow than is likely to occur as a result of the proposed EfW facility.
- 7.90 The salient issue for this assessment, therefore, is whether or not the small increase in heavy goods vehicles would materially and detrimentally alter the safety risk on the strategic road network. This is considered later in this report under the section entitled 'Likely Significant Effects'.

TRIP GENERATION

Existing Trip Generation

- 7.91 The existing landfill is currently permitted to operate until 2027 on current rates of input, which are in the region of 300,000 tonnes per annum. The majority of existing waste inputs to Ardley Landfill come from the commercial and industrial waste sectors, and the site currently receives about 50,000 tonnes of municipal waste per annum, mostly from Oxfordshire County Council.
- 7.92 Since the EfW facility would have capacity to deal with industrial and commercial waste, it is anticipated that waste inputs to the landfill will reduce to approximately 200,000 tonnes per annum when the EfW facility becomes operational. Therefore, the EfW facility will be complimentary of the existing landfill operations and this would result in an efficiency saving of 100,000 tonnes per annum.

Future Trip Generation

Heavy Goods Vehicle Trips

- 7.93 As previously identified, the proposed EfW facility will convert energy from an anticipated 300,000 tonnes of waste per annum and this would be delivered from the following sources:-
- 180,000 tonnes of municipal waste per annum.
 - 120,000 tonnes of industrial and commercial waste per annum will be delivered in bulk through the use of heavy goods vehicles.
- 7.94 Residual material resultant from the incineration processes would comprise Incinerator Bottom Ash (IBA) and Fly ash. As mentioned previously, IBA will be exported from the site for use as aggregate in the construction industry whereas Fly Ash will be exported to a hazardous waste landfill. IBA production typically equates to approximately 25% of the total input material and is therefore assumed to equate to 75,000 tonnes per annum. Fly Ash is assumed to represent 11,000 tonnes per annum.
- 7.95 This assessment is based on a 275 day working year and it is assumed that bulk deliveries transported using HGVs, together with vehicles exporting material, will accommodate 20 tonne loads. Refuse Collection Vehicles (RCVs) are assumed to carry 8 tonnes loads.
- 7.96 The tonnages stated are average predicted vehicles loads, although it is not expected that these will vary significantly from day to day as it is commercially sensible for vehicles loads to be maximised and, therefore, the majority of vehicles importing to and exporting from the EfW will be fully laden.
- 7.97 A breakdown of the anticipated imports, exports and average vehicle loads generated by the proposed development is provided in the table below. The

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resultant generation of heavy goods vehicles has been converted into PCUs for the purposes of comparison with the baseline data and this is shown separately within the table.

**Table 7/5
Proposed Trip Generation**

Waste Source	Imports - Annual Tonnage	Exports- Annual Tonnage	Average Load (tonnes)	Annual HGV Loads	Daily HGV Loads (PCUs)
MS Waste to EfW facility *delivered by RCVs	135,000	-	8	16,875	61 (122)
*delivered by HGVs	45,000	-	20	2,250	8 (17)
Subtotal	180,000			19,125	69 (139)
Commercial & Industrial Waste to EfW facility *delivered by HGVs	120,000	-	20	6,000	22 (44)
Subtotal	120,000			6,000	22 (44)
Bottom Ash Production	-	75,000	20	3,750	14 (28)
Fly Ash Production	-	11,000	20	550	2 (4)
Subtotal		86,000		4,300	16 (32)
Flue Gas Treatment	-	-	-	-	2 (4) (allowance)
General HGV Trips	-	-	-	-	2 (4) (allowance)
Total Trips to EfW facility	300,000	86,000	-	29,425	111 (223)
Net Landfill Trips Transferred to New Access	200,000	-	8	25,000	91 (182)
Total Trips via New Access	500,000	86,000	-	57,250	202 (404)

7.98 Interpretation of the above indicates that the proposed Facility would generate just 64 additional HGV/RCV trips per day ($202 - (91 / 2 \times 3) = 64$).

Timing of HGV's

7.99 To ascertain the likely timing of HGV movements on the surrounding local highway network, the TRICS database has been used to investigate the pattern of RCV deliveries to landfill sites within the UK and the Republic of Ireland. The TRICS database does not hold any trip data on EfW sites; however, for the purposes of this assessment RCV trips to landfill sites serve an identical purpose. The TRICS output is included together with all traffic calculations within Appendix 7-8.

7.100 Based upon a dataset of 12 landfill sites, approximately 10% of all daily HGV movements occur within the period 08:00-09:00 and less than 1% occur within the period 17:00-18:00. Table 7/5 above, shows that an estimated 61 RCV trips would access the EfW, although of this number, only 36 trips would be new to the road network as a result of the efficiency saving achieved through the complimentary relationship with the existing landfill.

7.101 Non-RCV movements (i.e. HGVs) would take place between 08:00 and 18:00 and are likely to be evenly distributed throughout the day. Based on a typical 10 hour working day, it can be assumed that one-tenth of all non-RCV heavy vehicle movements occur in any one hour, equating to approximately 10 two-way movements per hour.

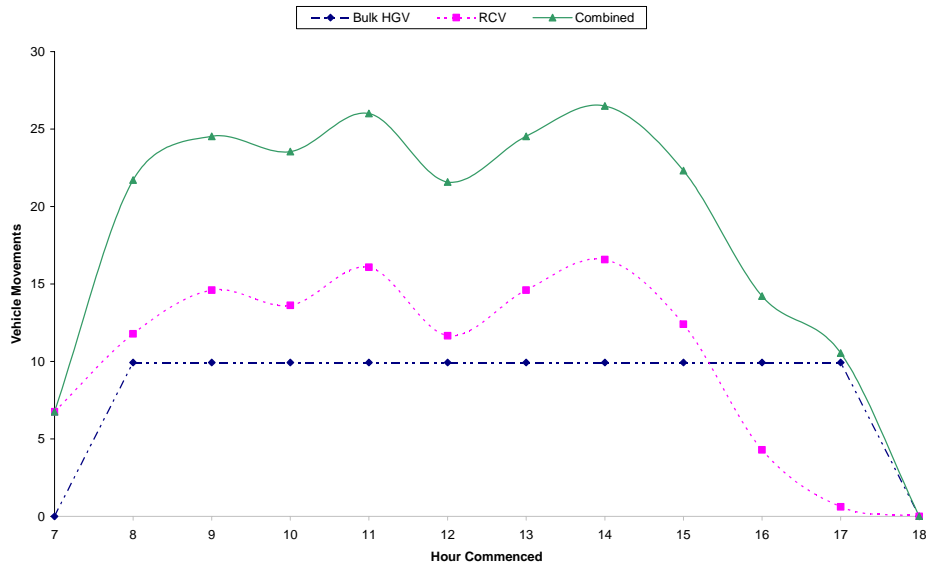
7.102 Based upon the above assumptions, a typical daily profile of HGV movements has been generated and is shown in Table 7/6 and Figure 1 below.

**Table 7/6
Daily HGV Movement Profile**

	Vehicle Movements in Hour Commencing:											
	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
RCV	7	12	15	14	16	12	15	17	12	4	1	0
Other HGV*	0	10	10	10	10	10	10	10	10	10	10	0
Total	7	22	25	24	26	22	25	27	22	14	11	0

*maximum likely movements per hour - based on 1/10th of total non-RCV movements

Figure 1
Daily HGV Movement Profile



7.103 The above analysis shows that approximately 22 two-way HGV movements would occur within the AM peak hour and 11 movements during the PM peak hour. A maximum of 27 two-way HGV movements per hour are expected during the intervening period. As a consequence, the majority of trips would occur outside of the busiest times on the road network.

Staff Vehicle Trips

7.104 The development proposals would generate a small number of light vehicle movements, principally by staff and contractors. It is anticipated that a maximum of 40 staff would be employed on the site and this would comprise a mix of day-working and shift-working. As stated previously, day workers would begin work at 08:00 hours and leave at 16:00 hours whereas shift workers would be split across three shifts commencing 07:00, 14:00 and 22:00 hours. Employees are expected to arrive in the 30 minute periods before and after their respective working hours.

7.105 Considering the limited opportunities to travel to the site via non-car transport modes, it would be reasonable to assume that all staff would travel to the site by car. However, whereas it is probable that some people would combine their journey to work through car sharing, this assessment is based on a worst case situation that journeys to work would be single occupancy car trips.

7.106 Therefore, to provide a rigorous assessment of peak hour traffic, 30 light vehicle arrivals and 10 light vehicle departures have been assumed during the AM peak. In the PM Peak, the reverse has been assumed whereby 10 arrivals and 30 departures would occur.

Visitor Centre

- 7.107 Trips to the visitor centre would be pre-arranged trips that would occur on a highly infrequent basis and would be undertaken outside of the busiest times on the road network. Given the educational nature, trips would comprise bus or coach vehicles which would reduce any traffic impact to a point which would be beyond insignificant.
- 7.108 Consequently, no allowance has been made for the trip attraction potential of the visitor centre since any affect would be impossible to accurately predict and the resultant impact would be immeasurably small.

Total Development Trips

- 7.109 The daily profiles of HGV and staff trips have been combined in order to provide an indication of the overall impact of the proposed development. The resultant total daily profile of development trips is provided at Appendix 7-9.

Trip Distribution & Assignment

- 7.110 The distribution of heavy goods vehicle movements has been undertaken with reference to Oxfordshire County Council's waste model, which identifies the origins and likely quantities of waste that will be delivered to the EfW during the operational phase. In so doing, the distribution of heavy goods vehicles has been considered separately for RCVs and HGV deliveries.
- 7.111 In the context of existing refuse collection vehicles already on the road network delivering to Ardley landfill but, which will be diverted to the EfW, the waste model identifies that the primary origins of waste would be Cherwell and Oxford City authority areas, as well as the County's waste recycling centres. The quantities of waste arising from each origin is summarised in the table below.

**Table 7/7
Daily RCV Movement Profile**

Authority Area	Annual tonnage 2014/15	Percentage Distribution
Cherwell	26,745	40%
Oxford City	39,594	60%
County WRCs	32,408	-
Total	98,747	100%

*waste from WRCs assumed to be as split from Cherwell/Oxford

- 7.112 The resultant 60:40 split has been validated by a site survey undertaken at the existing landfill access, which recorded the direction of existing goods vehicle movements. The waste model indicates the same directional split in the context of new refuse collection trips to the road network, as shown below.

**Table 7/8
Daily RCV Movement Profile**

Authority Area	Annual tonnage 2014/15	Percentage Distribution
West Oxfordshire South	22,792	30%
Oxfordshire Vale of White Horse	30,301	40%
Horse	26,313	30%
Total	79,406	100%

- 7.113 RCVs originating from West Oxfordshire and Vale of White Horse have been assigned via the B430 south and A34, whereas traffic originating from South Oxfordshire has been assigned via the M40.
- 7.114 The waste model also indicates that all HGVs, generally transporting commercial and industrial bulk waste, will originate from via the M40. All exported material has been assigned to the M40, with a 50:50 northbound/southbound split in order to reflect the fact that material would be taken to various destinations throughout the county.
- 7.115 Light vehicle movements are based upon an 80:20 split at the site access, with the majority of vehicles travelling north towards junction 10 of the M40 motorway. At the M40 junction, it has been assumed that 50% of the vehicles would originate from the south via the M40, 25% from the north via the M40, and the remaining 25% would be from the A43.
- 7.116 This assumption takes into account the local pool of potential employees located in places such as Banbury, Northampton and Oxford who would most likely travel via the M40. The proportion of traffic travelling from the south represents those trips being made primarily from Bicester who would be likely to travel via Middleton Stoney utilising the B430.
- 7.117 The development traffic flows, having been assigned to the highway network, are shown on the diagrams contained at Appendix 7-10. Appendix 7-11 shows the resultant 'with development' traffic flows for the 2013 and 2023 assessment years.

LIKELY SIGNIFICANT IMPACTS

Traffic Flow Increase

7.118 The calculated development traffic effects, as outlined above, have been considered against the baseline traffic flows for each link of each junction within the agreed study area road network. The results are provided in the tables below.

**Table 7/9
AM Peak - Net Traffic Impact**

Junction	Link	2013 Base	2023 Base	2013 + Dev.	2023 + Dev.	Net Percentage Increase	
						2013	2023
Middleton Stoney Crossroads	B430 North	582	644	586	648	0.7%	0.6%
	B4030 East	352	390	352	390	0.0%	0.0%
	B430 South	381	421	388	429	2.1%	1.9%
	B4030 West	339	375	339	375	0.0%	0.0%
Total		1654	1830	1,666	1,842	0.7%	0.6%
Proposed Site Access	B430 North	582	644	617	679	6%	5.5%
	Access Road	13	13	36	36	N/A	N/A
	B430 South	343	380	351	388	2.3%	2.1%
Total		938	1037	1004	1103	7%	6.4%
M40 J10 Southern Roundabout Junction	M40 off-slip	1195	1322	1,212	1,339	1.4%	1.2%
	B430 Station Rd.	402	445	421	464	4.8%	4.3%
	A43	1063	1176	1,081	1,194	1.8%	1.6%
Total		2660	2943	2,714	2,997	2.0%	1.8%
M40 J10 Services Roundabout Junction	Motorway Bridge	1347	1490	1,358	1,501	0.8%	0.7%
	A43 North Services	1177	1302	1,196	1,321	1.6%	1.4%
	Services access	224	248	224	248	0.0%	0.0%
Total		2749	3041	2,778	3,070	1.1%	1.0%
M40 J10 Northern Roundabout Junction	M40 off-slip	555	614	568	627	2.3%	2.1%
	A43 North	2226	2463	2,232	2,469	0.3%	0.2%
	A43 South	1153	1276	1,164	1,286	0.9%	0.8%
Total		3935	4353	3,964	4,382	0.7%	0.7%

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**Table 7/10
PM Peak - Net Traffic Impact**

Junction	Link	2013 Base	2023 Base	2013 + Dev't	2023 + Dev't	Net Percentage Increase	
						2013	2023
Middleton Stoney Crossroads	B430 North	332	368	338	374	1.8%	1.7%
	B4030 East	292	324	292	324	0.0%	0.0%
	B430 South	647	716	649	718	0.3%	0.3%
	B4030 West	419	464	419	464	0.0%	0.0%
	Total	1,691	1,872	1,699	1,880	0.5%	0.4%
Proposed Site Access	B430 North	316	350	334	368	5.7%	5.2%
	Access Road	1	1	475	525		
	B430 South	473	523	40	40	0.4%	0.4%
	Total	789	874	849	933	7.6%	6.8%
M40 J10 Southern Roundabout Junction	M40 off-slip	1,510	1,671	1,517	1,678	0.5%	0.4%
	B430 Station Rd.	371	410	405	444	9.2%	8.3%
	A43	625	691	635	702	1.7%	1.5%
	Total	2,505	2,772	2,557	2,824	2.1%	1.9%
M40 J10 Services Roundabout Junction	Motorway Bridge	1,798	1,990	1,819	2,011	1.2%	1.1%
	A43 North	825	913	836	924	1.3%	1.2%
	Services access	192	212	192	212	0.0%	0.0%
	Total	2,814	3,115	2,846	3,147	1.1%	1.0%
M40 J10 Northern Roundabout Junction	M40 off-slip	630	698	639	706	1.4%	1.2%
	A43 North	1,348	1,492	1,350	1,494	0.1%	0.1%
	A43 South	1,627	1,800	1,648	1,822	1.3%	1.2%
	Total	3,604	3,989	3,636	4,021	0.9%	0.8%

7.119 The above results indicate the greatest impact to be in the weekday morning peak hour, with net percentage increases of around 2% on the B430 Southern approach to the Middleton Stoney signalised junction, and around 4% at the B430 approach to the M40 southern roundabout. Overall, however, the impact at these junctions is just 1% and 2%, respectively.

7.120 A more detailed review of the figures reveals that the traffic flow increases on the identified approaches equates to less than 10 vehicles at the southern approach to the Middleton Stoney signalised junction, which equates to less than 1 additional vehicle per traffic cycle. Therefore, the logic suggests that baseline users of the junction might be unfortunate enough to experience a queue of just +1 additional vehicle, which an unperceivable difference.

Environmental Impacts

7.121 The guidelines for the Environmental Assessment of Road Traffic (IEA, 1993) suggest two broad rules to define where there would be a need for an environmental impact analysis. These are as follows:-

- Highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); or
- Sensitive areas where traffic flows will increase by 10% or more.

7.122 In agreement with the Highways Authority, there are three sensitive areas within the study area road network and these are listed below. The areas that are considered to be sensitive for reasons of capacity or local disturbance include:

- the roundabout serving the northbound carriageway of the M40 motorway at Junction 10;
- the signal controlled junction at Middleton Stoney; and
- the village of Ardley.

7.123 The results provided in Tables 7/9 and 7/10 demonstrate that the proposed development would not result in traffic increases of more than 10% within the sensitive areas. At all other locations, the traffic increases would be less than the 30% threshold and consequently, it is determined that there is no requirement to undertake a full environmental impact analysis.

7.124 Nevertheless, further analysis has been undertaken to assess the impact of the development proposals in respect of the operating capacities of the signalised junction in Middleton Stoney as well as the roundabout serving the northbound carriageway of the M40 at Junction 10. Further details are provided in the subsequent section entitled 'Capacity Impacts'.

CAPACITY IMPACTS

Proposed Site Access

- 7.125 The operation of the proposed site access junction has been assessed using TRL software PICADY 5, which is an industry standard tool used to predict capacity, queue lengths and delays at priority junctions.
- 7.126 The software provides a number of measurements in its output, the most meaningful of which are the 'Ratio of Flow to Capacity' (RFC) and queue lengths. The RFC is a measure of capacity which is shown as a value of between '0' and '1', where a value above 1 indicates a breach of capacity. Traditionally, RFC's of less than 0.85 are considered to be robust as this includes a margin for reliability and variation.
- 7.127 Full details of the PICADY output files are included in Appendix 7-12 and, for ease of reference, the results are summarised in the table below.

**Table 7/11
Site Access Capacity Assessment**

Movement	AM Peak		PM Peak	
	RFC	Max Q (veh)	RFC	Max Q (veh)
2013				
Site Access to B430 North	0.039	0.04	0.061	0.07
Site Access to B430 South	0.008	0.01	0.010	0.01
B430 South to Site Access	0.014	0.01	0.003	0.00
2023				
Site Access to B430 North	0.041	0.04	0.064	0.07
Site Access to B430 South	0.008	0.01	0.010	0.01
B430 South to Site Access	0.014	0.01	0.003	0.00

- 7.128 The above results indicate that the proposed site access would operate well within the capacity thresholds in all assessment scenarios. Indeed, the worst case RFC is calculated to be just 0.064 in the 2023 scenario. This suggests that the junction would utilise only 6.5% of the junction's design capacity. Therefore, the proposed site access junction is acceptable from a highway capacity perspective.

B430 / B4030 Signal Junction - Middleton Stoney

- 7.129 As indicated within Tables 7/9 and 7/10, the calculated development traffic would not result in a material change in demand at the signalised junction that is formed where the B430 meets with the B4030 in Middleton Stoney.
- 7.130 Nevertheless, in agreement with the Highway Authority, capacity analysis of the junction has been undertaken in order to establish the capacity effects that the calculated development traffic might have. With this in mind, the industry standard tool for capacity analysis of signalised junctions, LINSIG, has been used to assess the junction.
- 7.131 Geometric input parameters have been taken from those used within the Heyford Park assessment of the junction and the staging, phasing and inter-green variables have been confirmed by Oxfordshire County Council's signals department.
- 7.132 The detailed output is provided at Appendix 7-13, however, for ease of reference, the results are summarised in the tables below: Table 7/12 summarises the results of the existing situation and establishes the suitability of the model for further analysis, whereas tables 7/13 and 7/14 summarise the results of the 'with' and 'without' development scenarios in the AM and PM peaks, respectively.

**Table 7/12
Middleton Stoney Capacity Assessment –
Existing Traffic Flows**

Junction Approach	AM Peak Existing Traffic Flows		PM Peak Existing Traffic Flows	
	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)
B4030 (EAST)	92.7	15.2	92.0	13.0
B430 (SOUTH)	83.5	10.0	96.4	27.2
B4030 (WEST)	91.3	14.2	95.5	18.9
B430 (NORTH)	91.2	20.0	38.8	6.8
PRC	-3.1 @ 120 seconds		-7.2 @ 120 seconds	

- 7.133 The above results indicate that the junction currently operates at capacity, with calculated degrees of saturation being broadly 100% on critical links, and this correlates with the expectations of the Highway Authority. On this basis, the model is considered to be a suitable basis for further assessment and, consequently, further analysis has been undertaken for the 'with' and 'without' development scenarios. The results are summarised within the tables below.

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Table 7/13
Middleton Stoney Capacity Assessment –
AM Peak ‘With’ & ‘Without’ Development

Junction Approach	2013 Base (Without Dev’t)		2023 Base (Without Dev’t)		2013 Base + Development		2023 Base + Development	
	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)
B4030 (EAST) B430	101.1	22.2	103.0	22.2	105.7	27.9	103.0	26.6
(SOUTH) B4030	101.4	24.5	126.1	63.5	99.5	18.3	128.4	67.6
(WEST) B430	104.8	25.7	100.8	23.1	104.8	25.7	105.4	28.7
(NORTH)	99.9	31.2	123.8	88.9	100.7	33.8	120.7	82.6
<i>PRC</i>	-16.4 @ 120 seconds		-40.2 @ 120 seconds		-17.4 @ 120 seconds		-42.7 @ 120 seconds	

Table 7/14
Middleton Stoney Capacity Assessment –
PM Peak ‘With’ & ‘Without’ Development

Junction Approach	2013 Base (Without Dev’t)		2023 Base (Without Dev’t)		2013 Base + Development		2023 Base + Development	
	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)	Deg. Sat. (%)	Mean Max Q (PCUs)
B4030 (EAST) B430	106.2	24.5	117.0	40.2	106.2	24.5	117.0	40.2
(SOUTH) B4030	106.8	49.7	120.8	92.3	107.9	52.5	122.0	95.6
(WEST) B430	104.5	30.3	120.2	59.8	104.5	30.3	120.2	59.8
(NORTH)	41.2	7.5	43.9	8.3	41.7	7.6	44.4	8.5
<i>PRC</i>	-18.7 @ 120 seconds		-34.2 @ 120 seconds		-19.9 @ 120 seconds		-35.5 @ 120 seconds	

7.134 The above results are based on an assumption of peak hour growth which ignores the fact that the junction already operates as capacity which will constrain the potential for peak hour growth. A more likely situation, which is widely recognised, is that any growth in traffic would be likely occur in the form of peak hour spreading or be accommodated by some travellers seeking alternative routes.

- 7.135 Furthermore, it is worth noting that the assessment is based on a highly robust assumption that every member of staff would result in car trip, which is unlikely, and it ignores the likely benefits that the proposed staff travel plan would achieve.
- 7.136 Nevertheless, on the basis of the robust analysis above, the results indicate that junction capacity would be breached in both the 2013 and 2023 baseline scenarios as a result of background traffic growth, to the extent that the junction would require about 45% less traffic to operate within acceptable limits. Therefore, the junction would be over capacity even without the development proposals.
- 7.137 The results indicate that the addition of development traffic would marginally impact on the operation of the traffic signals in the order of -2.5% practical reserve capacity. However, the analysis is likely to overestimate the impact of development traffic given the disproportionate affects that occur as a result of additional traffic at a junction that is already at or over capacity.
- 7.138 Therefore, the traffic impact of the development proposals would be acceptable from a capacity perspective.

B430 / Junction 10 M40 Motorway

- 7.139 Capacity analysis of the roundabout connecting the B430 to the northbound carriageway of the M40 Motorway was undertaken as part of the assessment for the Heyford Park mixed-use development and this was accepted by the Highways Agency. Therefore, the parameters used in the Heyford Park development have been adopted for the purposes of this assessment using the TRL software program ARCADY.
- 7.140 As with PICADY, the most meaningful measurements in the program's output are the RFC and queue lengths. The full output is provided at Appendix 7-14 whereas the results are summarised in the tables below.

**Table 7/15
Junction 10 Capacity Assessment –
Northbound Carriageway Off/On-Slip (AM Peak)**

Approach	2013 Base (Without Dev't)		2023 Base (Without Dev't)		2013 Base + Development		2023 Base + Development	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
A43	0.532	1.1	0.593	1.4	0.543	1.2	0.604	1.5
M40 Slip	0.764	3.2	0.869	6.2	0.780	3.5	0.886	7.2
B430	0.311	0.4	0.363	0.6	0.325	0.5	0.379	0.6

**Table 7/16
Junction 10 Capacity Assessment –
Northbound Carriageway Off/On-Slip (PM Peak)**

Approach	2013 Base (Without Dev't)		2023 Base (Without Dev't)		2013 Base + Development		2023 Base + Development	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
A43	0.304	0.4	0.337	0.5	0.310	0.4	0.343	0.5
M40 Slip	0.860	5.8	0.963	17.2	0.867	6.2	0.971	19.3
B430	0.327	0.5	0.390	0.6	0.357	0.6	0.422	0.7

7.141 The above results indicate that the junction would operate within traditionally acceptable capacity limits during the AM peak period in the 2013 situation, although this threshold would be exceeded by the baseline situation at 2023. However, having said this, the assessments are based on an 'OD-Tab' demand profile which assumes that 2/3rds of the hourly traffic arrives in the middle 30 minute period which, in the case of the M40 slip roads in particular, is considered to be unlikely. Therefore, the results are likely to underestimate existing junction capacity.

7.142 Nevertheless, ignoring this fact, the results indicate that the operating capacity of the junction would be marginally worsened by the addition of development traffic. However, the impact of the development equates to just +1% of the junction capacity which is immaterial to its operation. Therefore, the development impacts at the junction are acceptable from a capacity perspective.

Road Safety Impacts

7.143 A review of personal injury accidents within the study area network has been undertaken at the section entitled 'Baseline Review'. It was concluded that the salient point for this assessment was whether an increased number of heavy goods vehicles would materially worsen the existing safety risk on the road network.

7.144 Having regard to the trip generations calculated within the section of the report entitled 'Future Trip Generation', it is concluded that the increase in the number of heavy goods vehicles would not be so great as to materially worsen the existing safety record of the highway network. Therefore, the development proposals are acceptable from a highway safety perspective.

IMPACT DURING CONSTRUCTION PHASE

Context

7.145 Construction of the Facility is anticipated to occur over a 26 month programme commencing in April 2011 and ending in July 2013, although it is anticipated that earth moving operations will be undertaken prior to this date. The main elements of construction on the site are summarised below:

- earth moving operations and groundworks;
- construction of building foundations and below ground elements;
- construction of building steel structure and facades;
- installation of mechanical equipment;
- site ground-works and landscaping; and
- testing and commissioning.

7.146 Construction of the EfW facility will require imports of construction materials, machinery and plant to accord with these elements. The following sections assess the likely volumes of traffic associated with these activities and the impact that this will cause on the adjacent transport network.

Trip Generation

7.147 Based on the construction operations detailed above and an anticipated commencement date of 2011, construction traffic will access the site over a two year period, with peak construction vehicle movements likely to occur in 2011.

7.148 All access to the construction works will take place from the proposed access junction which will be included in the preliminary phase of the overall construction contract. It is envisaged that all traffic would be routed from the M40.

7.149 In terms of the number of HGV trips associated with the full construction phase, due to start in 2011, this will depend on the successful contractor's preferred construction methods. However, based on previous experience, it is considered that, on average, there would be up to 25 HGV trips (50 movements) per day associated with construction. However, the level of trip generation could reduce depending on certain construction methods such as, for example, the use of a mobile concrete batching facility on site.

7.150 It is estimated that there would be up to approximately 200 construction personnel, and given the location of the site, all of these personnel would be expected to arrive by road, as a car driver or passenger, or the via the contractor's own transport arrangements. Assuming a car occupancy rate of 1.2 persons per vehicle, this equates to 167 light vehicle trips per day (334 movements).

7.151 Based on these figures, it is evident that the level of HGV trip generation would be broadly similar to the operational phase, which has been assessed

for traffic impact. Light vehicle trips, however are likely to be greater than for the operational phase (167 trips per day compared with 110 trips per day).

Construction Phase Travel Plan

7.152 In order to mitigate the impact of construction traffic during network peak hours, a Construction Phase Travel Plan will be developed and implemented by the successful contractor. Elements of this specific plan will include:

- coordination of car share for construction personnel;
- implementation of contractor operated mini bus service;
- restriction of unnecessary vehicle movements during the day; and
- coordination of deliveries to arrive outside of peak times where appropriate.

7.153 With implementation of these measures, it can be expected that the volume of light vehicle trip generation can be brought down below the levels assessed for the operational phase of the development.

Traffic Impacts

Proposed Site Access Junction

7.154 The assessments undertaken in this TA for operational phase traffic demonstrate that the capacity of the proposed site access junction operates well within their available capacity when taking account of baseline traffic growth and additional development traffic.

7.155 Given that baseline traffic growth will be less, and that construction phase trip generation levels can be mitigated so that they do not exceed operational phase levels, it is concluded that the junction will also operate well within capacity during the construction phase

Road Safety

7.156 The proposed access junction will be constructed as part of the construction phase of the project and implementation of the necessary works within the highway will be undertaken under suitable traffic management schemes. With the presence of a suitable traffic management scheme, it is considered that the works may be accommodated without an adverse impact on road safety.

7.157 Delivery of construction materials to the site is a potential hazard to be considered. As Principal Contractor under the CDM Regulations, the contractor will have an obligation to ensure that all works on site are undertaken in a safe manner. This will include deliveries to the site, and the Health and Safety Plan developed by the contractor will include a requirement for all drivers delivering to the site to drive with due care and attention, and with specific regard to the safety of other road users.

- 7.158 Subject to the above consideration, it is envisaged that there would not be an adverse impact on road safety during the construction phase.

Environmental Impacts

Dust and Dirt

- 7.159 The principal concerns of construction traffic in relation to dust and dirt can be considered to be materials falling off the back of delivery vehicles whilst on the road network, and dirt and detritus migrating onto the public highway from the construction site.
- 7.160 The contractor will deploy the following elements of mitigation to ensure that these effects can be minimised:
- provision of appropriate wheel cleaning facilities at the site exit;
 - a regular programme of road cleaning;
 - a regular programme of cleaning to traffic management cones, lights and signs; and
 - a requirement that all vehicles carrying granular materials to the site are sheeted when on the public highway.
- 7.161 These measures could be secured by an appropriately worded condition and, subject to these measures being implemented it is considered that there would not be an adverse impact on the road network caused by dust and dirt.

MITIGATION

- 7.162 In light of the above assessment, the following measures of mitigation are proposed as part of the development proposals.

Environmental Issues

- 7.163 Viridor would employ appropriate measures to ensure that waste is not deposited on to the surrounding highway network. All imports and exports would either be sheeted or enclosed within waste collection vehicles that are specifically designed to contain and transport waste.

Staff Travel Plan

- 7.164 In order to further mitigate the already negligible traffic impact of the proposed development during the operational phase, a travel plan will be prepared which will be aimed at encouraging staff to travel to and from the development using sustainable non-car travel modes. As discussed previously, a separate travel plan will be prepared by the successful contractor in order to minimise the impact of construction traffic.
- 7.165 As part of the Plan, a Travel Plan Coordinator (TPC) will be appointed who will have the responsibility for inducting new staff to the travel plan and highlighting to them the health and environmental benefits associated with travelling to work by modes other than car.
- 7.166 The TPC will provide copies of the travel plan to all members of staff and updated versions will be provided if and when required. The TPC will also be responsible for maintaining a database of all staff addresses, contact details and work patterns. The TPC will regularly review this database to identify where opportunities exist for staff to share their journey to work through car sharing. This will be supplemented by details of web based car share clubs such as www.carshareGM.com and www.nationalcarshare.co.uk which will be provided within the Plan. This will increase the potential for staff to car share with employees of any business located nearby.
- 7.167 Car sharers will also be guaranteed a lift home in case of emergency or if the driver of the car share vehicle is required to leave work outside of the agreed hours. This will allay fears amongst potential car sharers of being 'stranded'.

RESIDUAL IMPACT

7.168 Taking into account all the factors assessed in this report and the mitigation measures outlined above, a final analysis of the impacts resulting from the development proposals has been undertaken and is summarised in the table below.

**Table 7/17
Summary of Impact**

Potential Impact	Impact Duration	Significance	Mitigation	Residual Impact
Highway and Junction Capacity	Permanent	Minor Adverse	New access	No Impact
Driver Delay	Permanent	Minor Adverse	N/A	Minor Adverse
Road Safety	Permanent	Minor Adverse	Environmental enhancements to reduce speeds	Minor Beneficial
Pedestrian / Cyclist Amenity	Permanent	No Impact	N/A	No Impact
Detritus on Highway Network	Permanent	Moderate	Good management practice	Insignificant
Construction Impacts	Temporary	Moderate Adverse	Vehicle routing & travel plan arrangements	Minor Adverse
Public Rights of Way	Permanent	No Impact	N/A	No Impact

7.157 Overall, it is considered that the development proposals would have an insignificant impact in traffic and transport terms.

CONCLUSIONS

7.169 The Chapter has been prepared to assess the traffic and transport impacts of the proposed development at Ardley Landfill, Ardley. The report is summarised as follows.

- The development proposals comprise a new EfW facility located on part of the Ardley landfill site served from a new priority T-junction. The new access will accommodate all movements to the EfW facility as well as existing movements associated with the landfill operations. The junction has been designed in accordance with all relevant guidelines and has been independently assessed from a safety perspective.
- The proposed development is unlikely to attract a significant number of non-car trips due to the type of use and its geographical location in the context of local employment catchment areas and the proximity to non-car infrastructure. Therefore this assessment robustly assumes that all staff trips will result in a new car trip although, in reality, this is unlikely given the propensity to car share. The attractiveness of car sharing will be reinforced through implementation of a travel plan.
- The existing safety record of the highway has been reviewed and it has been concluded that there is no pattern of accidents that is suggestive of a highway layout deficiency that leads to unacceptable safety risks. Furthermore, the impact of development traffic would be immeasurably small. Consequently, the proposed development is acceptable from a highway safety perspective.
- The trip attraction potential of the development proposals has been considered on a first principles basis and the traffic flow increases do not justify full environmental impact assessment.
- The impact of development traffic on the operation of the highway network has also been assessed using computer modelling techniques. The results of the modelling exercise demonstrate that the proposed development would not have any bearing on the capacity of the road network, particularly at peak times. Therefore, the development proposals are acceptable from a highway capacity perspective.
- It is not envisaged that construction traffic levels will exceed those calculated for the operational phase of development subject to the identified mitigation measures including a travel plan.

7.159 Having regard to the above, it is considered that the development proposals are acceptable in traffic and transport terms.