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12.0 TRAFFIC AND TRANSPORTATION

12.1 Introduction

12.1.1 This Chapter examines the transport related environmental effects associated with the proposed Vale of York Motorway Service Area (MSA) development. The assessment considers the effects of the construction and operational phases of the development on:

- Severance;
- Driver Delay;
- Pedestrian delay and amenity;
- Accidents and safety;
- Hazardous loads; and
- Fear and intimidation.

12.1.2 In assessing the above effects this Chapter considers the following matters:

- 2017 Base Year;
- Proposed Vale of York MSA operational with associated highway works (2027 and 2032);
- Appropriate measures to mitigate any unacceptable impact; and
- Residual impacts.

12.1.3 The assessment year of 2027 is in line with Highways England Policy. North Yorkshire County Council (NYCC) has requested that impact on changes to the local highway network be assessed for 15 years after the date of application (2032) and this represents the most robust case for the assessment of development traffic on the local highway network.

Proposed Development

12.1.4 A description of the Proposed Development is described within the Scheme Description within Chapter 4.0. Development specific to transport-related effects is the undertaking of:

- highway works to construct 4No. slip roads (2No. merges and 2No. diverges), 2No. roundabouts and motorway overbridge to provide vehicular access to the MSA from both directions on the motorway.

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- development of a controlled rear access junction to provide vehicular access to the site for staff and a small proportion of deliveries (but not the general public) from the B6265; and
 - the realignment of the A168 northern arm on the eastern side of the motorway to enable construction of the southbound slip roads and connecting roundabout.

12.2 Methodology

Legislation and Guidance

12.2.1 Policy Guidance, as it pertains to the transportation issues of the Proposed Development, are set out in Section 2 of the Transport Assessment which accompanies the Planning Application and includes:

- National Planning Policy Framework (NPPF);
- National Planning Practice Guidance (NPPG);
- Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development;
- Harrogate District Local Plan; and
- North Yorkshire Local Transport Plan 2016-2045.

12.2.2 Guidance on the assessment of the impact of traffic movements on the environment is given in the Institute of Environmental Assessment (IEA), now known as the IEMA, document “Guidelines for the Environmental Assessment of Road Traffic”. This assessment generally follows these guidelines as they relate to traffic and transport and remain the current guidance.

12.2.3 In order to assess the transport impacts of the proposals a Transport Assessment has been prepared in accordance with the National Planning Practice Guidance (NPPG) (Paragraph: 001 to 015 Reference ID: 42-001-20140306). The NPPG guidance superseded the previous DfT Guidance on Transport Assessment which has been withdrawn. The Transport Assessment has been submitted in support of the Planning Application for the Proposed Development.

Assessment Methodology

12.2.4 This section sets out the methodology used for baseline data collection and the assessment of traffic and transport impacts of the Proposed Development during

the operational and construction phases. This Traffic and Transportation chapter has been informed by the Transport Assessment and the methodology set out here is consistent with that used in the Transport Assessment.

Consultation

12.2.5 Pre-application meetings have been held with Highways England (HE) and North Yorkshire County Council (NYCC) as well as the local planning authority Harrogate Borough Council (HBC). The HE are the strategic highway authority responsible for the A1(M) and NYCC are the local highway authority responsible for the local road network in the vicinity of the site including the A168/B6265 roundabout, A168 to the east of the motorway and B6265 running east-west immediately south of the site. During the scoping discussions it was agreed with NYCC and HE that the following road network should be assessed:

- New Merge/Diverge junctions with the A1(M) to access/egress the MSA;
- A168/B6265 roundabout junction; and
- Controlled site access junction on the B6265.

12.2.6 It was agreed, that for the purpose of the Transport Assessment, the network should be assessed in 2027 ten years after submission of the planning application (in line with DfT Circular 02/2007). The HE required an assessment at year of opening. For the purposes of assessing the impact on the local road network, NYCC requested a future year of 15 years after the submission of planning application (2032) which is more robust than that required on the SRN.

Baseline Data Collection

12.2.7 Baseline traffic data has been obtained at the following locations:

- A1(M) northbound and southbound at MIDAS sites 9939A and 9938B located between junctions 48 and 49 (immediately west of RAF Dishforth). This data has been obtained from Highways England's WebTRIS system for 2016 ;
- A 24 hour turning movement survey at the A168/B6265 roundabout junction; and
- In addition, Surveys have been undertaken at adjacent motorway services facilities on the A1(M) to determine the proportion of the motorway traffic using the services (known as the Turn In Rate (TIR)).

12.2.8 To determine mainline flows on the A1(M) past the site, a neutral month of September was identified for 2016 and flows calculated based on data for the 18th to 24th September 2016 which provided a complete week of data. For the parking calculation the peak month of July 2016 has been used in accordance with Circular 02/2013 – see TA section 5).

12.2.9 A Manual Classified Count (MCC) for the A168/B6265 roundabout was undertaken on Tuesday 4th July 2017 and collected data of all turning movements for a period of 24 hours. The MCC survey period included the date of the manual counts allowing the validity of the manual data to be verified.

12.2.10 Accident data for the local road network and the relevant section of the A1(M) has been obtained for the 5 year period, 2012 to 2016 inclusive.

Transport Assessment

12.2.11 This section summarises how the impact of the traffic associated with the Proposed Development has been assessed both within this Chapter and in the Transport Assessment supporting the planning application. The following tasks have been undertaken:

- Baseline traffic conditions have been derived from traffic surveys undertaken.
- The traffic movements associated with the MSA have been taken as a proportion of the mainline flows on the A1(M). It should be noted that motorway service areas do not generate traffic in their own right (apart from staff trips), but divert traffic off the motorway which later re-joins. Turn in Rates (TIRs) of 7.5% of northbound A1(M) traffic and 7.5% of southbound A1(M) traffic have been used for the TA and these are comparable to the TIRs at Wetherby services (A1(M) Junction 46). These TIRs have been applied to the mainline motorway traffic;
- The relative impact of the MSA traffic on the local highway network has been considered as a percentage increase in all vehicles and in Heavy Goods Vehicles (HGV); and
- 2027 future year junction capacity assessments have been carried out both for the SRN and 2032 assessment for the local road network.

Study Area

12.2.12 The IEMA guidelines suggest that the study area should include:

- Highway links where traffic flows would increase by more than 30% (or the number of heavy goods vehicles would increase by more than 30%); and
- Any other specifically sensitive areas where traffic flows have increased by 10% or more.

12.2.13 As discussed above, the traffic that would use the MSA is not new traffic, it would be traffic that diverts off the motorway to use the MSA for the purpose of taking a break from driving. On this basis any increase in traffic flow on the SRN would be limited to some deliveries and staff trips to the Site during the operational stage and a short term impact of during the construction phase of some construction traffic travelling to/from the Site once the A1(M) slips roads are constructed. The study area is therefore confined to staff, delivery and construction traffic using the following junctions:

- New A1(M) MSA slip roads;
- A168/B6265 roundabout junction; and
- Rear site access on the B6265.

12.2.14 Table 12.1 below identifies the links within the study area.

Table 12.1 Links Within the Study Area

Link No.	Link Name	Location
1	Southbound Off-Slip (new highway construction)	Southbound Off-Slip connecting the A1(M) southbound to the MSA roundabout
2	Southbound On-Slip (new highway construction)	Southbound On-Slip connecting the MSA roundabout to the A1(M) southbound
3	Northbound Off-Slip (new highway construction)	Northbound Off-Slip connecting the A1(M) northbound to the MSA roundabout
4	Northbound On-Slip (new highway construction)	Northbound On-Slip connecting the MSA roundabout to the A1(M) northbound
5	A168 (North)	Northern arm from roundabout
6	A168 (South)	Southern arm from roundabout
7	B6265 (East)	South-eastern arm from roundabout

Link No.	Link Name	Location
8	B6265 (West)	Western arm from roundabout

Assessment of Significance / Assessment Criteria

12.2.15 The IEMA guidelines identify the potential receptors that should be considered when assessing the impact of traffic and transportation. The significance of an environmental effect is derived from the sensitivity of the receptor and the magnitude of the impact. Receptors to be considered include:

- People at home;
- People in work places;
- Sensitive groups including children, elderly and disabled;
- Sensitive locations, e.g. hospitals, churches, schools, historic buildings;
- People walking;
- People cycling;
- Open spaces, recreational sites, shopping areas;
- Sites of ecological/nature conservation value; and
- Sites of tourist/visitor attraction.

12.2.16 The potential receptors on highway links within the study area have been considered. These are identified for each link in Table 12.2.

Table 12.2 Receptors Within the Study Area

Link Number	Receptors
1-4	Rural motorway (new highway construction)
5-6	No significant receptors
7	Residential properties in Kirby Hill
8	Overbridge and access to agricultural fields

12.2.17 Table 12.2 above identifies that the number of receptors is limited. None of the areas of open space identified are public open space. There is only one link identified near a residential area, this being residential properties in Kirby Hill. The number of people currently walking or cycling in the study area is very small,

although it is accepted that the numbers may slightly increase if the MSA were constructed due to staff movements to/from the site.

12.2.18 The categorisation of the magnitude of impact brought about by the Proposed Development (see Table 12.5) varies depending upon the type of impact being considered (e.g. severance, driver delay etc). In considering the impacts on the different topic areas regard has been had to the relevant guidance contained in the IEMA Guidelines. This guidance is further discussed in the following paragraphs.

12.2.19 In considering the value of any receptor, it is necessary to have regard to the nature of the impact being considered. For example, a rural motorway would be considered of high environmental sensitivity in terms of Driver Delay, but of low or negligible in terms of pedestrian delay as there would be little or no pedestrian activity. The potential sensitivity level of the receptors identified in Table 12.2 has been considered in Table 12.3 below:

Table 12.3 Receptor Sensitivity

Value (sensitivity)	Typical descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution
High	High importance and rarity, national scale, and limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution
Low (or Lower)	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale

12.2.20 The sensitivity of the receptors identified in Table 12.2 are considered in Table 12.4 below.

Table 12.4 Sensitivity of Receptors Within the Study Area

Link Number	Receptors	Sensitivity
1	Rural motorway	High
2	Rural motorway	High
3	Rural motorway	High
4	Rural motorway	High
5	No significant receptors	Negligible

Link Number	Receptors	Sensitivity
6	No significant receptors	Negligible
7	Residential properties in Kirby Hill	Medium
8	Overbridge and access to agricultural fields	Low

12.2.21 The definition of the Magnitude of the Impact, their significance and Typical Descriptors are set out in Table 12.5.

Table 12.5 Magnitude & Significance of Impact and Typical Descriptors

Significance of Impact	Magnitude of Impact	Typical Criteria Descriptors (BENEFICIAL & ADVERSE)
SIGNIFICANT	Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse). Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
	Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse). Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
NOT SIGNIFICANT	Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to one (or maybe more) key characteristics, features or elements (Adverse). Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
	Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse). Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
	No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

12.2.22 The IEMA methodology sets out a number of effects to be considered. These are outlined below. Almost all of the criteria do not provide specific thresholds by which the magnitude of such effects can be measured, and as a result the effects have been measured qualitatively throughout the rest of the Chapter, where necessary. Clearly, effects can be Beneficial or Adverse as set out in Table 12.5.

Severance

12.2.23 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic route. Whilst the IEMA Guidelines refer to the effect of traffic on severance of 30%, 60% and 90% changes producing “slight”, “moderate” and “major” changes in severance respectively, it is suggested that caution be applied to relying on these quanta of change. The consideration of severance in this assessment has had due regard to specific local conditions, in particular, the location of pedestrian routes to key local facilities and whether crossing facilities are provided or not.

Driver Delay

12.2.24 Traffic delays to non-development traffic can occur:

- At the site access where there would be additional turning movements;
- On highways surrounding the site where there may be additional flow; and
- At key junctions on the nearby highway network.

12.2.25 Impact on driver delay is based on the quantum of change in delay derived from the junction modelling undertaken in the preparation of the Transport Assessment.

Pedestrian Delay

12.2.26 The proposal would bring about increases in the number of vehicle movements on the links within the study area. In general terms, increases in traffic levels are likely to lead to greater increases in delay to pedestrians seeking to cross roads. The IEMA Guidelines recommend that, rather than rely on thresholds of pedestrian delay, the assessor should use judgement to determine whether pedestrian delay is a significant impact.

Pedestrian Amenity

12.2.27 Is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. The IEMA Guidelines cite a doubling of traffic flow (or its lorry component) as representing a threshold for impact evaluation.

Accidents and Safety

12.2.28 The Personal Injury Accident (PIA) record for the local highway network has been obtained from North Yorkshire County Council (NYCC) for the most recently available 5 year period. The impact of additional traffic from the proposals is considered in terms of magnitude of traffic increase and existing accident record data and any committed highway improvements.

Hazardous Loads

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

Fear and Intimidation

12.2.30 This again relates to pedestrians, and shares characteristics with pedestrian amenity. There are no commonly agreed thresholds for estimating danger, but research work is cited setting out "degree of hazard" levels relating to 18 hour average traffic flow, 18 hour HGV flow and average vehicle speed. These levels are considered within this Chapter in terms of impact.

Limitations

12.2.31 The Transport Assessment methodology makes a number of assumptions related to turn in rates, construction vehicles, staff movements and deliveries. In addition a number of assumptions have been made on the impact of other developments and traffic growth. None of these assumptions are unusual in the preparation of a Transport Assessment.

12.3 Baseline

Existing Highway Network

12.3.1 In highways terms the A1(M) is a key part of the SRN. It carries a reasonably high amount of through traffic travelling between the north and south of England.

12.3.2 There is also a certain amount of local traffic using the A1(M) for journeys of one or two junctions in the section of the A1(M) between Knottingley and Leeming Bar.

Junction 32A of the A1(M) links with the M62 which runs across the country between Hull and Manchester. Junction 43 of the A1(M) links with the M1 motorway which provides a direct link into Leeds via the M621.

- 12.3.3 The A168 is a local road and runs parallel to the A1(M) between Hunsingore and Junction 49 at Dishforth on the southbound carriageway and ultimately links Thirsk to Wetherby. The A168 meets the B6265 at a roundabout in the south eastern corner of the Site. The B6265 is a single, two-way route which travels westward from the A168/B6265 roundabout, across an overbridge of the A1(M) and passes the southern boundary of the Site, where it continues and provides a direct link into Ripon. The B6265 also runs southeast from the A168/B6265 roundabout and leads to the A59 which provides a link to York. The main MSA Site currently has a single point of access and egress. Access is taken directly from the B6265 in the southwest corner of the site via a simple junction leading to a gated access point.

Existing Pedestrian Infrastructure

- 12.3.4 When considering the distance over which walking is an effective mode of transport, PPG13 stated that:

“Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2 kilometres”.

- 12.3.5 Although PPG13 has been superseded by the NPPF, the principle of encourage walking as a mode for short distances is still relevant.

- 12.3.6 On the main vehicle accesses off the motorway pedestrians are prohibited, and a rear access into the Site is proposed in the vicinity of the existing field access on the B6265 for staff. In the location of the proposed rear site access, there is no pedestrian footway provision on either side of the B6265. Approximately 450m to the east of the proposed Site access the A168 / B6265 roundabout provides un-controlled pedestrian/cycle crossing facilities on all arms of the roundabout but these do not link to any existing footway provision except a hardstrip across the motorway overbridge which could potentially be used by pedestrians. The footway on the B6265 starts again approximately 400m south east of the A168 / B6265 roundabout and links to the village of Kirby Hill and onwards to the small town of Boroughbridge. There is no footway on the B6265 to the west of the Site until Ripon racecourse, approximately 5.7km to the west.

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- 12.3.7 Through Kirby Hill and Boroughbridge there are footways on one or of both sides of the B6265 (Leeming Lane) and street lighting.
- 12.3.8 The pedestrian isochrone plan is presented at **Appendix 12.1** but clearly to achieve these distances would require pedestrians to walk on the carriageway as there is no footway provision.

Existing Cycle Infrastructure

- 12.3.9 Cycling is an important mode of travel at the local level and is widely regarded as having the potential to replace short car trips especially those less than 5 kilometres. Encouraging more commuting trips by cycle is a particular aim for many local authorities seeking to encourage cycling as an alternative to car travel.
- 12.3.10 A five kilometre journey by cycle to/from the site encompasses Dishforth and Boroughbridge, as well as several other smaller villages including Langthorpe, Kirby Hill, Skelton-on-Ure, Marton-le-Moor, Norton-le-Clay and Roecliffe.
- 12.3.11 Bar Lane/Roecliffe Lane in Boroughbridge provides a sign posted on-road cycle route on the National Cycle Network. Route 88 travels between Winterburn and Linton-on-Ouse through Boroughbridge and other smaller villages.
- 12.3.12 The B6265 does not include cycle lanes but there are shared pedestrian facilities at the A168/B6265 roundabout which enable cyclists to negotiate this roundabout safely.
- 12.3.13 A cycle plan is provided in **Appendix 12.2** showing the main routes within the vicinity of the site.

Public Transport Services

Bus Services

- 12.3.14 The closest bus stop to the site is located 1km south east at the corner of Church Lane and the B6265 in Kirby Hill. There is no shelter available, but a flag and pole bus stop with seating provided. Bus route 7 serves this stop.
- 12.3.15 Bus route 7 is a once daily service operating Monday to Friday. It operates between Boroughbridge and Kirby Hill, stopping at Langthorpe on route. Service No.12. 7 is operated by Atkinson Coaches.

12.3.16 There are bus stops in Boroughbridge which provide more services in the area. These are located approximately 2km from the site and accessible as part of a multi-modal journey by cycle or bus. Services 1A, 2, 3, 5 and 6 stop in the Market Place of Boroughbridge.

12.3.17 The table below shows the frequency of bus services within the vicinity of the proposed development.

Table 12.6 Bus Services in the Vicinity of the Site

Service	Route	Frequency		
		Mon to Fri	Sat	Sun
6	Boroughbridge – Ripon	One service leaving Boroughbridge at 13:48	No Service	No Service
7	Boroughbridge – Langthorpe – Kirby Hill	One service leaving Kirby Hill at 10:50	No Service	No Service

Rail Services

12.3.18 There are very limited railway facilities in the vicinity of the Site. However, the bus 1A from Boroughbridge provides access to/from the site to Knaresborough railway station located approximately 12km to the south west. The station provides a service to Leeds and York every 30 minutes and every hour, respectively.

2017 Base Traffic Data

12.3.19 In the Transport Assessment the impact of the MSA has been assessed at the following junctions:

- A1(M) MSA access junction;
- A168/B6265 roundabout junction; and
- Controlled site access on B6265.

12.3.20 Weekday traffic surveys were undertaken on 4th July 2017 at the existing A168/B6265 roundabout junction immediately east of the A1(M). The 24hour surveys were undertaken in early July and were classified by vehicle type and include all turning movements which therefore provide the flows on the B6265 past the site and the A168 (a section of which is proposed to be realigned).

12.3.21 **Table 12.7** shows the Base 2017 two-way traffic flows for the sections of the highway network identified in Table 12.1. The busiest hours at this junction are 0800-0900 and 1700-1800.

Table 12.7 2017 Peak Hour Traffic Flows (two-way)

Link Number	Link Name	AM Peak (0800-0900) (veh/hr)		PM Peak (1700-1800) (veh/hr)	
		LGVs/Cars	HGV	LGVs/Cars	HGV
5	A168 (North)	335	43	338	24
6	A168 (South)	761	57	827	27
7	B6265 (East)	288	21	248	14
8	B6265 (West)	730	61	793	17

Junction Assessments

12.3.22 Table 12.8 below reports on the performance of the current situation to assist with the assessment of the impact of the Proposed Development on the local highway network .

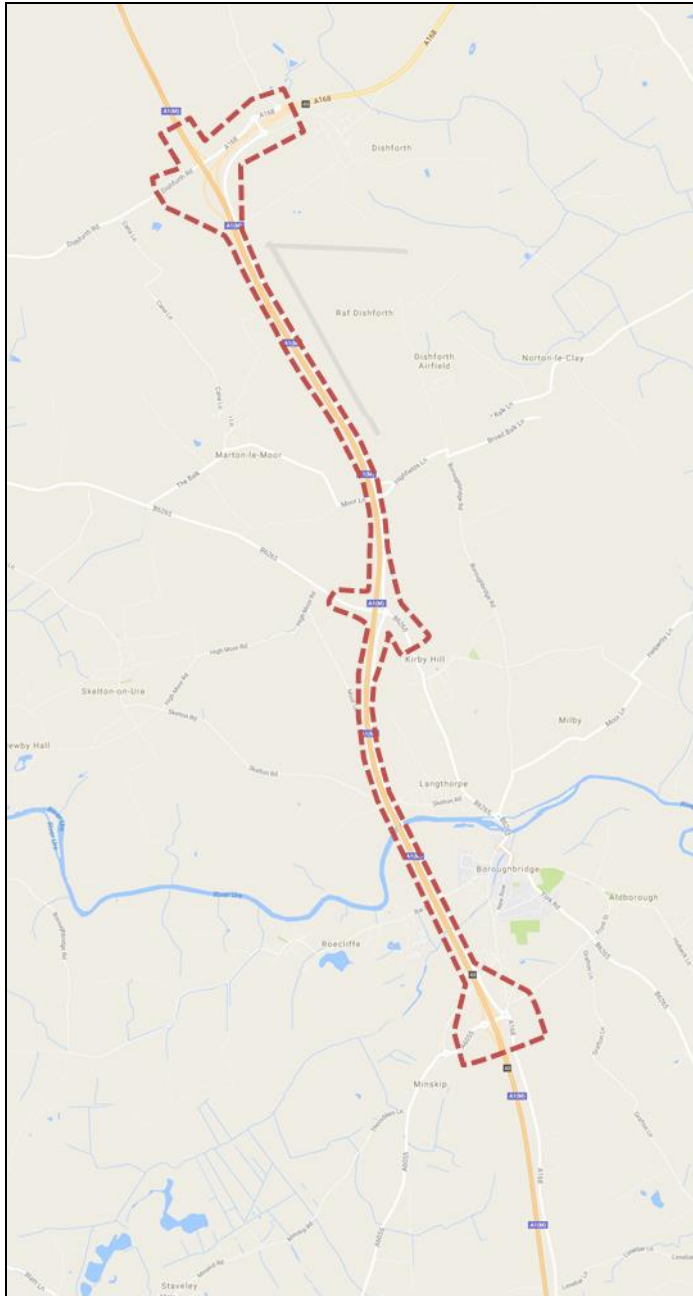
12.3.23 The modelling software package Junctions 9 has been used to assess the operation of the local highway network junctions. Junctions 9 uses Ratio to Flow Capacity (RFC) to measure the capacity of a junction approach. RFC values of 0.85 or less are considered to indicate the acceptable operation of the junction. Each approach also has a maximum queue value, which is the maximum number of vehicles expected to queue on the approach at the busiest time period of operation.

Table 12.8 2017 Base Junction Assessment

Link Number	Link Name	AM Peak		PM Peak	
		RFC	Queue	RFC	Queue
5	A168 (North)	0.14	0.2	0.11	0.1
6	A168 (South)	0.27	0.4	0.34	0.5
7	B6265 (East)	0.14	0.2	0.11	0.1
8	B6265 (West)	0.28	0.4	0.27	0.4

Accidents and Safety

12.3.24 In order to examine the existing collision record, Personal Injury Collision (PIC) data was obtained from NYCC for the highway network surrounding the Proposed Development Site. The extent of the study area is shown below and includes the length of the A1(M) between, and including, Junction 48 and Junction 49, as well as the A168 and A168/B6265 roundabout junction.



12.3.25 Data was obtained for the most recently available five year period, 2012 and 2016 inclusive. In total there were 80 collisions recorded during this time, 10 of which were classified as serious and the remaining 70 as slight. There were no fatalities.

A map plotting the locations of the recorded collisions is presented in **Appendix 12.3**.

12.3.26 In order to examine the collision pattern, data has been analysed at the following locations which are discussed below:

- A1(M) mainline (between J48 and J49);
- A1(M) Junction 48 (motorway mainline within the junction and slip roads);
- A1(M) Junction 49 (motorway mainline within the junction and slip roads);
- B6265 / A168 roundabout junction and its approaches; and
- A168 (between roundabout with B6265 and A1(M) Junction 49).

A1(M) between J48 and J49

12.3.27 There were 3 collisions recorded as serious and 27 as slight on the length of the A1(M) between Junction 48 and Junction 49. A summary of the collisions is provided in the table below.

Table 12.9 Summary of Collisions Occurring on A1(M)

Severity and Number	Light	Dark	Wet	Dry	Single Veh	Veh to Veh	Veh to M/cycle
Slight (27)	16	11	6	21	10	23	-
Serious (3)	1	2	1	2	-	3	-
Total (2)	17	13	7	3	10	23	-

12.3.28 The three serious collisions occurred due to driver error including distraction in the vehicle, driver impaired by alcohol and poor weather conditions (heavy rain). The majority of collisions incurring slight injuries were due to driver error, with one caused by debris from a tyre blowout and another due to severe winds which blew an HGV into the central reserve safety barrier.

Junction 48

12.3.29 There were a total of 16 slight collisions recorded at the A1(M) Junction 48. A summary of the collisions is provided in the table below

Table 12.10 Summary of Collisions Occurring at the A1(M) Junction 48

Severity and Number	Light	Dark	Wet	Dry	Single Veh	Veh to Veh	Veh to M/cycle
Slight (3)	14	2	5	11	2	14	-

12.3.30 The main reason for collisions at Junction 48 was driver error. Two of the recorded collisions were due to poor weather (high wind and heavy rain), and two other collisions were due to debris on the roads causing vehicles to lose control. The majority of accidents led to more than one vehicles being involved.

Junction 49

12.3.31 There were a total of 24 slight collisions recorded at the A1(M) Junction 49, and 4 collisions recorded as serious. A summary of these is provided in the table below.

Table 12.11 Summary of Collisions Occurring at the A1(M) Junction 49

Severity and Number	Light	Dark	Wet	Dry	Single Veh	Veh to Veh	Veh to M/cycle
Slight (24)	13	11	15	9	7	12	5
Serious (4)	4	-	-	4	2	2	-
Total (28)	17	11	15	13	9	14	5

12.3.32 Of the collisions in the table above, 24 were classified as slight, with the majority due to driver error. The other main reason was the weather where drivers experienced black ice and slippery road surfaces, all of which were in wet conditions.

12.3.33 Of the four serious accidents that occurred at Junction 49, three were considered to be due to driver error, all of which experienced loss of control. The fourth accident was due to poor weather conditions involving high winds which led to a motorcyclist losing control.

A168/B6265 Roundabout Junction

12.3.34 There were six slight collisions recorded on the A168/B6265 roundabout junction and three collisions recorded as serious. A summary of this is provided in the table below.

Table 12.12 Summary of Collisions Occurring on A168/B6265 Roundabout Junction

Severity and Number	Light	Dark	Wet	Dry	Single Veh	Veh to Veh	Veh to M/cycle
Slight (3)	3	-	3	-	1	1	1
Serious (3)	2	1	2	1	1	2	-
Total (6)	5	1	5	1	2	3	1

12.3.35 The three slight collisions occurred due to driver error by not looking properly and also a slippery material on road surface which caused the vehicle to slide and overturn when travelling around the roundabout. This was during wet conditions.

12.3.36 The three serious collisions all occurred due to loss of control of drivers.

A168

12.3.37 There were four collisions reported along the A168, all of which were recorded as slight. A summary of this is provided in the table below.

Table 12.13 Summary of Collisions Occurring along the A168

Severity and Number	Light	Dark	Wet	Dry	Single Veh	Veh to Veh	Veh to M/cycle
Slight (4)	2	2	3	1	3	-	1

12.3.38 All four accidents were as a result of driver error. Three were due to manoeuvres by vehicles, whilst the fourth occurred in wet weather in which the driver skidded through a puddle.

Summary of Accidents

12.3.39 The number and spread of collisions that have been recorded during the latest five-year period indicates that there is not a specific safety problem on the highway network surrounding the Site. There have been only six collisions reported at the A168/B6265 roundabout junction between 2012 and 2016 (inclusive).

Future 2027 and 2032 Baseline Traffic Flows

12.3.40 To convert the 2016 and 2017 base year traffic counts to the future base years of 2027 and 2032 it is necessary to apply growth factors. It has been agreed with NYCC and HE that it is appropriate to apply industry standard TEMPRO growth factors to reflect the growth associated with background traffic growth.

12.3.41 In order to factor the 2016 and 2017 counts to the opening (2027) and future (2032) years, traffic growth factors have been calculated using TEMPRO version 7.2. Growth factors for rural motorways in the North Yorkshire region have been used to factor through flows on the A1(M). Factors for principal urban roads in the North Yorkshire region have been used to factor all other traffic flows. To calculate the adjusted local growth figure, National Traffic Model (NTM) traffic growth calculations have been used. The calculated growth rates are shown in the tables below.

Table 12.18 TEMPRO/ NTM Growth Rates for Rural Motorways in North Yorkshire

Growth Period	Average Day
2016 to 2027	1.129

Table 12.19 TEMPRO/NTM Growth Rates for Urban Principal Roads in North Yorkshire

Growth Period	AM Peak
2017 to 2032	1.132

12.3.42 The resulting 2032 base traffic flows on the links identified as being impacted on by the MSA traffic are detailed in Table 12.20.

Table 12.20 2032 Peak Hour Flows

Link Number	Link Name	AM Peak (veh/hr)		PM Peak (veh/hr)	
		Veh	HGV	Veh	HGV
5	A168 (North)	379	49	383	27
6	A168 (South)	861	65	936	31

Link Number	Link Name	AM Peak (veh/hr)		PM Peak (veh/hr)	
		Veh	HGV	Veh	HGV
7	B6265 (East)	326	24	281	16
8	B6265 (West)	826	69	898	19

12.4 Assessment of Effects

Incorporated Mitigation / Works

12.4.1 The layout of the MSA is shown on the site Masterplan shown on Figure 1.2 and includes the following highways elements:

- New northbound and southbound slip-roads in to the site from the A1(M);
- New northbound and southbound exit slip-roads from the site to the A1(M);
- New controlled access / exit via the B6265 (southwest corner of the proposed development) to enable vehicular access for staff and some deliveries (there would be no connection to the motorway for the general public); and
- Alteration to the A168 (N) approach at the A168/B6265 roundabout junction.

Construction Phase

12.4.2 There would be a number of components of construction traffic including:

- Construction vehicles;
- Employee movements associated with construction; and
- Vehicle movements associated with movement (import and export) of materials.

12.4.3 A description of the construction phase has been undertaken and is presented in Chapter 4.0. It includes an indicative construction programme, estimated construction traffic flows, vehicle routing and anticipated access and compound locations.

12.4.4 It is envisaged that two site compounds would be required, one for the construction of the amenity building and highway works to the west of the motorway and one for the proposed highway works to the east of the motorway. The position of the compounds has not been finalised although it is expected that the one for the amenity building and highway works west of the motorway would be on the area

allocated for proposed HGV parking at the northern end of the MSA site, while the compound for the highway works to the eastern side of the A1(M) would be on land to the east of the existing A168.

- 12.4.5 Temporary haul roads may be required to provide access to the compounds from the existing highway network. It is envisaged that construction traffic west of the motorway would access the western compound from the proposed rear access off the B6265 and the formal junction in this location (currently an existing field access) would be constructed during the first phase of development. For the eastern site compound this would be accessed from the existing A168 with a temporary access junction.

Working Hours

- 12.4.6 It is anticipated that the core working hours for construction would be as follows:

- 07:00 -19:00 hours weekdays;
- 09:00 – 13:00 Saturdays: and
- No working normally undertaken on Sundays and Bank Holidays.

- 12.4.7 The core construction working hours would ensure that most construction employee traffic (and some deliveries) would generally arrive and depart outside the peak hours.

Traffic Routing

- 12.4.8 All construction traffic from the A1(M) is likely to use J49 (if travelling to/from the north) or J48 (if to/from the south) and the A168 to access B6265 and the site compound(s). It is likely that construction-related HGVs through Marton le Moor, Kirby Hill and Boroughbridge would not be permitted and this would be set out in a Construction Management Plan for approval by the LPA and both highway authorities. We can assume 50% of HGVs to be to/from the site compound to the west of the motorway (accessed from the B6265 and 50% to the east of the motorway, accessed off the existing A168/B6265 roundabout and A168).

- 12.4.9 Permitted routes and signing for construction traffic would be agreed with NYCC prior to the commencement of construction on site. The relevant authorities would be consulted about providing direction signage on the surrounding roads to avoid vehicles using inappropriate routes to reach the Site.

Construction Traffic

12.4.10 During the peak construction phase there would be up to 250 HGV movements to the site each day to remove excess excavated material. This would only be for a period of about 2 months. Construction traffic would be determined in more detail once the detail design is commenced.

Severance

12.4.11 The levels of construction traffic are relatively low, particularly in the context of the wider development. The current levels of pedestrian movement around the roads carrying construction traffic are very low and the large spacing between surrounding settlements and facilities leads to the impact being considered **Negligible** and therefore **Not Significant**.

Driver Delay

12.4.12 The levels of construction traffic are relatively low, in the context of the wider development. There would be a concentration of construction traffic at the B6265 / site access junction to the west of the motorway and A168 construction access to the east of the motorway but as most construction staff trips would occur outside the peak hours the impact on Driver Delay is considered **Negligible** and **Not Significant**.

Operational Phase

12.4.13 Assessments have been undertaken both with and without development in the AM and PM peak for the future years of 2027 (for the SRN) and 2032 (for the local road – A168) at the following junctions and Merge/Diverge Assessments in accordance with DMRB TD 22/06:

- Assessment of any potential change in flows at the A168/B6265 roundabout junction as a consequence of staff trips/deliveries to/from the MSA and proposed realignment of the A168 (north) arm (note the A168 realignment should not result in any changes to pattern and volume of traffic using the A168;
- Assessment of the likely flows at proposed controlled vehicular access into the site off the B6265; and
- Assessment of proposed northbound and southbound merges and diverges (to/from A1(M)).

12.4.14 The merge and diverge assessments have been undertaken for the agreed future year of 2027 to establish the impact on the slip roads of motorway traffic travelling to/from the Vale of York MSA facilities.

12.4.15 The A168/B6265 roundabout junction and controlled vehicular access on the B6265 were also assessed without and with the proposed development for the future years of 2027 (in line with HE Policy-Circular 02/13) and 2032 (as requested by NYCC) to establish the impact of the MSA on the local highway network.

Severance

12.4.16 When considering severance, the following factors have been taken into account to determine the sensitivity of the highway links:

- The likely desire for direct movement between communities or destinations across the link. Links with a high potential demand for movement to and from facilities across the link would be categorised with high sensitivity. Conversely, those with no direct movement across the link would be given low sensitivity.
- Links with crossing demand and facilities which are at-grade (especially unsignalised) crossings would be categorised by a higher sensitivity. Links with grade separated crossings would have a lower sensitivity as they would be unaffected by changes in traffic flows.

12.4.17 There are only four points where pedestrian routes cross points in the highway network that would experience an increase in traffic flow due to the MSA proposals. These are located across each arm of the A168/B6265 roundabout junction. However, it should be noted that these crossing points do not link to any existing footway/cycleway on any of the four arms of the junction and therefore are unlikely to be used by any Non-Motorised Users (NMUs) except a very small number of cyclists (the 24 hour survey undertaken recorded only 11 cycle movements across the full survey day (0000-2400)).

12.4.18 Pedestrian and cycle flows at these points are currently very low due to the significant distances between adjacent communities and any facilities that people may be attracted to walk to. There may be some increase in cycle movements at these locations due to staff movements associated with the MSA.

12.4.19 **Table 12.21** below shows the severance effect of the proposals on the links identified. The four proposed slip roads are not included as they would not have any severance effect because of their location and the fact they would comprise new motorway construction.

Table 12.21 Impact of Severance on Links identified

Link Number	Link Name	Link Sensitivity	Magnitude of Impact	Significance
1	Southbound Off-Slip	High	N/A*	N/A
2	Southbound On-Slip	High	N/A	N/A
3	Northbound Off-Slip	High	N/A	N/A
4	Northbound On-Slip	High	N/A	N/A
5	A168 (North)	Negligible	Negligible	Not Significant
6	A168 (South)	Negligible	Negligible	Not Significant
7	B6265 (East)	Medium	Minor Adverse	Not Significant
8	B6265 (West)	Low	Minor Adverse	Not Significant

* N/A as slip roads are new highway construction

12.4.20 On the majority of the links the impact is considered to be no change as there would be no demand to cross the link, and as such, the additional traffic associated with the Proposed Development is not considered to effect severance. Overall the effect of Severance is considered to be **Negligible** and **Not Significant**.

Driver Delay

12.4.21 The tables below indicate the change in Ratio to Flow Capacity (RFC) and queues at approaches on the identified network links with and without the proposed MSA.

Table 12.22 2032 AM Peak Hour with and without MSA

Link Number	Link Name	2032 Base without MSA		2032 Base with MSA	
		RFC	Queue	RFC	Queue
5	A168 (North)	0.17	0.2	0.22	0.3
6	A168 (South)	0.38	0.6	0.39	0.6
7	B6265 (East)	0.17	0.2	0.17	0.2
8	B6265 (West)	0.34	0.5	0.35	0.5

Table 12.23 2032 PM Peak Hour with and without MSA

Link Number	Link Name	2032 Base without MSA		2032 Base with MSA and realignment	
		RFC	Queue	RFC	Queue
5	A168 (North)	0.14	0.2	0.18	0.2
6	A168 (South)	0.41	0.7	0.42	0.7
7	B6265 (East)	0.13	0.1	0.13	0.1
8	B6265 (West)	0.33	0.5	0.34	0.5

12.4.22 It can be seen from the tables above that the impact of the MSA on driver delay is negligible and that the junction would operate satisfactorily during the peak hours, with RFCs on each approach of less than 0.85, and only minor changes to the queue lengths.

12.4.23 Therefore, the magnitude of Driver Delay is therefore considered to be **Negligible** and **Not Significant**.

Pedestrian Delay and Amenity on Links

12.4.24 Given that pedestrian and cycle facilities in the vicinity of the Site are limited, with no direct pedestrian route to/from the site, the magnitude of impact of development traffic flows to/from the site on pedestrian amenity and delay would be **Negligible** and therefore **Not Significant**.

Accidents and Safety

12.4.25 The sensitivity of a link in terms of accidents and safety is considered in the context of the nature of the link, including:

- The existing personal injury accident record of the link;
- The type of link and link characteristics such as vehicle speed, and the potential consequences of accidents, e.g. a strategic link of high importance could have a high or very high sensitivity; and
- The level of congestion experienced on the link.

Table 12.24 Impact of Accidents and Safety on Links

Link Number	Link Name	Number of Accidents in 5 year period	Sensitivity	Magnitude	Significance
1	Southbound Off-Slip	N/A	Negligible	N/A*	N/A
2	Southbound On-Slip	N/A	Negligible	N/A	N/A
3	Northbound Off-Slip	N/A	Negligible	N/A	N/A
4	Northbound On-Slip	N/A	Negligible	N/A	N/A
5	A168 (North)	Low	Low	Minor Adverse	Not Significant
6	A168 (South)	Low	Low	Minor Adverse	Not Significant
7	B6265 (East)	Low	Low	Minor Adverse	Not Significant
8	B6265 (West)	Low	Low	Minor Adverse	Not Significant

* N/A as slip roads are new highway construction

12.4.26 Because the proposed Vale of York MSA serves existing users of the motorway network it would assist in improving road safety by increasing the number of opportunities for the travelling public to stop and take a break during the course of their journey. It is unlikely that the limited number of additional vehicle trips to and from the rear access of the site (associated with staff and deliveries) would have an adverse impact on road safety on the A168 or B6265.

12.4.27 Whilst the addition of merges and diverges to the A1(M) creates new junctions with the motorway, these have been designed fully in accordance with DMRB TD22/06 and the junction would be clearly signed for all users of the motorway (subject to the approval and signing of a Traffic Signs Agreement for the MSA).

12.4.28 Table 12.24 indicates that the number of accidents that have occurred on the network under consideration in the last five years is low. Only six accidents have occurred of which three were slight and three were serious accidents all due to driver error and loss of control.

12.4.29 Motorway Service Areas perform a vital road safety function by providing opportunities for drivers to stop and take a break during the course of their journey. Government advice is that drivers should stop and take a break of at least 15

minutes every two hours. There is a clear link between driver fatigue and accidents occurring on the motorway network.

- 12.4.30 The provision of a motorway service area would therefore be a major benefit to road safety on the Strategic Road Network but not on the network immediately adjacent to the MSA. Weighing the significant beneficial impact of an MSA to strategic movements against the very small potential adverse impact of the additional traffic (associated with staff and deliveries) on the safety of the local road network it is considered that the impact of the Development on Accidents and Safety would be **Major Beneficial** and therefore **Significant**.

Hazardous Loads

- 12.4.31 While the Proposed Development would not generate any additional trips that would be classified as Hazardous Loads, apart from the fuel tankers servicing the MSA, it would attract Hazardous Load vehicles to leave the motorway to use the facilities and then to re-join the motorway but would of course provide drivers of these loads with an opportunity to take a break from driving.
- 12.4.32 Given the small amount of additional travel distance by these vehicles and the additional interaction with other vehicles while negotiating the junctions this impact is considered to be **Negligible** and therefore **Not Significant**.

Fear and Intimidation

- 12.4.33 The sensitivity of a link to fear and intimidation are primarily related to the level of pedestrian and cyclist activity along those links. On links where there are high levels of pedestrian and cycle activity, the sensitivity would be related to the volumes of HGV traffic and the level of separation between the pedestrians/cyclists and vehicular traffic.
- 12.4.34 As already identified the levels of pedestrian/cycle movement are very low and are unlikely to increase significantly as a consequence of the development. Therefore the impact of Fear and Intimidation is considered to be **Negligible** and **Not Significant**.

12.5 Mitigation

12.5.1 The following section outlines mitigation measures that are to be built into the approach to construction and operation that would reduce identified potential effects and provide appropriate environmental protection.

Construction Phase

12.5.2 The construction phase would be carried out in accordance with a Construction Environment Management Plan (CEMP) to be developed by the Principal Contractor to include those measures within this section. In relation to Traffic and Transport the key element of mitigation would be the adoption and operation of a Construction Traffic Management Plan (CTMP).

12.5.3 The CTMP would include a palette of measures that could be used to mitigate the impacts of construction vehicle movements including vehicle routing, restricted working hours, consolidation of deliveries and avoiding deliveries during network peak hours and, if possible, the requirement for contractors to hold accreditation to the Fleet Operation Recognition Scheme (FORS) and Construction Logistics, Cycle Safety and Work Related Road Risk Scheme, or similar.

Operational Phase

12.5.4 During operation of the MSA, the following initiatives would be adopted to minimise impact of staff and delivery trips to/from the site:

- Framework Travel Plan (see Transport Assessment: **Appendix J**); and
- Delivery and Servicing Plan (although it is acknowledged that the likely number of deliveries is relatively small due to the way Applegreen supplies its sites).

12.5.5 Travel plans represent an opportunity to raise awareness within organisations and their employees about the consequences of their transport choices and the benefits of choosing sustainable alternatives. The expectation is that a culture of sustainable travel can be cultivated by making people aware of opportunities for travel by sustainable modes at an early stage.

12.5.6 The Travel Plan is primarily aimed at the journey to and from work and has the overriding objective of reducing the number of single occupancy car trips. A detailed Travel Plan would be provided once the development details are confirmed

and a commitment to this undertaking would be conditioned as part of any planning permission.

12.5.7 It is estimated that 10 HGV servicing and fuel deliveries would be made per day based on information from Applegreen's operations elsewhere, 5 of which are likely to occur between 23:00-07:00. It is anticipated that the majority of the food deliveries would be made via the motorway as these vehicles may already be using the SRN to make other deliveries across the region or to other MSAs etc. A small proportion may use the proposed rear access to the site.

12.5.8 A Delivery and Servicing Plan (DSP) would be prepared to maximise the efficiency of delivery and servicing movements. The Vale of York MSA development would benefit from the fact that Applegreen's operational model means that all deliveries are undertaken by Applegreen fleet vehicles, giving the operator ultimate control on how these are undertaken and reducing overall delivery numbers.

12.6 Residual Effects and Conclusions

Residual Effects

12.6.1 The study area is dominated by existing highway infrastructure, including the A1(M) and the A168 and B6265. There are few sensitive receptors as most of the surrounding area is open farm land and any pedestrian routes are lightly used as pedestrian links are not provided between settlements and potential attractions on the surrounding local road network.

Construction

12.6.2 The levels of construction traffic are relatively low, in the context of the wider development flows, and the peak in construction traffic would occur over a relatively short time period. On this basis the effect of construction related traffic in respect of severance and driver delay is considered to be **Negligible** and **Not Significant**.

Operational

12.6.3 The location of the Proposed Development and exiting provision on local highway network means that pedestrian routes through the study area do not perform a role in connecting local settlements and attractors. Movements along these routes are low and, although the Proposed Development would slightly increase the traffic

levels crossing these routes in places, it is considered that the magnitude of impact of the Proposed Development on Severance would be **Negligible** and **Not Significant**.

12.6.4 There are very few pedestrians who use the footways through the study area primarily, as mentioned above, because they do not connect significant settlements and attractions. It is considered that the overall magnitude of impact of the proposals on Pedestrian Delay would be **Negligible** and **Not Significant**.

12.6.5 Pedestrian Amenity is broadly defined as the relative pleasantness of a journey for pedestrians. The Proposed Development would lead to a very minor increase in HGVs using the local road network but given the negligible pedestrian movements in the vicinity of the Site, the magnitude of impact on Pedestrian Amenity is considered to be **Negligible** and **Not Significant**.

12.6.6 The highway safety record in the study area is good. The Proposed Development would result in a very slight increase in traffic movements through the study area (as a consequence of staff and delivery movements) leading to the possibility of a very slight rise in the number of accidents. However, the primary purpose of motorway service areas is to allow drivers on the Strategic Road Network to take a break, significantly reducing the level of fatigue-related accidents that could occur on the motorway. For this reason the magnitude of the overall impact of the Proposed Development on accidents and safety is considered to be **Major Beneficial** and therefore **Significant**.

12.6.7 The Proposed Development would not increase the number of trips by Hazardous Loads but it would lead to some diverting off the motorway to use the proposed MSA facilities. Given the small amount of additional travel distance by these vehicles, the impact of abnormal loads is considered to be **Negligible** and **Not Significant**.

12.6.8 As the levels of pedestrian and cycle flow in the study area are low, the magnitude of the impact of the Proposed Development on Fear and Intimidation is considered to be **Negligible** and **Not Significant**.

Conclusions

12.6.9 This Traffic and Transportation Chapter considers the impact of additional traffic movements related to the Proposed Development on:

-
- Severance;
 - Driver Delay;
 - Pedestrian delay and amenity;
 - Accidents and safety;
 - Hazardous loads; and
 - Fear and intimidation.

12.6.10 The traffic flow changes that would arise from the Proposed Development were derived in the Transport Assessment. In addition the operation of the highway network was modelled in the Transport Assessment and the results fed back into the consideration of Driver Delay in this Chapter.

12.6.11 The assessment has demonstrated that the Proposed Development would result in a Negligible magnitude of effect that is Not Significant for all of the matters listed above, with the exception of Accidents and Safety. In this regard the Proposed Development would result in a significant beneficial impact on road safety of the SRN which would considerably outweigh the impact of the very small increase in traffic flows (associated with staff and deliveries) on the safety of the local road network. On this basis it is concluded that the Proposed Development would have a **Major Beneficial (Significant)** impact on Accidents and Safety.