

CHAPTER 8:

TRAFFIC & TRANSPORT

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8.0 TRAFFIC & TRANSPORT

8.1 Scope of Assessment

- 8.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of traffic & transport and is supported by Appendices 8.1 and 8.2.
- 8.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments just over 1km of the Site.

8.2 Key Legislation, Policy and Guidance Considerations

- 8.2.1 The traffic & transport assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

The Town and Country Planning (Environmental Impact Assessment) Regulations (2017)

- 8.2.2 This document sets out regulations for the preparation of an environmental impact assessment (EIA) and states that the EIA must identify, describe and assess the direct and indirect effects of the Proposed Development on the following factors:
- Population and human health;
 - Biodiversity;
 - Land, soil, water, air and climate; and
 - Material assets, cultural heritage and the landscape.

Planning Policy

National Planning Policy Framework (February 2019)

- 8.2.3 The National Planning Policy Framework (NPPF) was published in February 2019 and updated in June 2019. Policy has moved towards securing more sustainable outcomes with emphasis on minimising the need to travel, reducing car use and encouraging more sustainable modes of transport. In considering travel in the context of planning applications the following NPPF paragraphs are relevant:
- 8.2.4 Paragraph 103 states that “Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”

- 8.2.5 Paragraph 111 states that “All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.”
- 8.2.6 Promoting Sustainable Transport section emphasises the need to plan for sustainable travel, but also to be pragmatic about the variability of transport options in different communities. This is relevant in the context of the Development, where there is an excellent provision of public transport in proximity to the Site.
- 8.2.7 The NPPF is supported by National Planning Practice Guidance (NPPG). The NPPG is a guidance document, published in March 2014, that supports the NPPF. It includes a section on ‘Environmental Impact Assessment’, which provides guidance on undertaking EIAs

Reading Borough Local Plan (November 2019)

- 8.2.8 Reading Borough Council’s (RBC) new Local Plan was adopted on 4th November 2019 and sets out planning policies for development in Reading up to 2036 in order to guide development. The Local Plan succeeds the previous development plans, including the Reading Central Area Action Plan and the Core Strategy.
- 8.2.9 Part of the application site has been identified in Policy CA1b as a site for development of between 90 and 130 residential homes, community provision including healthcare and replacement clubhouse. The policy states that any development should;
- “Take measures to mitigate impacts on the highway network, particularly on Kidmore End Road”.
- 8.2.10 Section 4.5 of the document outlines the Transport policies; these are based on meeting the objectives set out in the current Local Transport Plan for the period 2011- 2026.
- 8.2.11 Policy TR3 within the document outlines access, traffic and highway-related matters, stating;
- “Proposals involving a new or altered access onto the transport network, improvement works to the transport network, the creation of new transport infrastructure or the generation of additional trips on the transport network, consideration will be given to the effect on safety, congestion and the environment”
- 8.2.12 The policy further states that in order for a development to be permitted;
- “any proposed development should not have a material detrimental impact on the functioning of the transport network”
- 8.2.13 Policy TR4 provides guidance on cycle routes and facilities, and states;
- “Developments will be expected to make full use of opportunities to improve access for cyclists to, from and within the development and to integrate cycling through the provision of new facilities.”

Reading Borough Council’s Climate Emergency Declaration

8.2.14 RBC declared a climate emergency on 26th February 2019. By means of announcement on their website, RBC's noted the progress made by the borough since 2015 and the importance of having a Climate Action Plan. This declaration also highlighted the strategies and actions that RBC are putting in place in order to deliver a Zero Carbon future, these are:

- 'Zero Carbon Standards' within its draft Local Plan;
- The RBC Carbon Plan;
- The forthcoming consultation on options, such as a Clean Air Zone, for improving local air quality and reducing congestion prior to publishing our draft Fourth Local Transport Plan;
- The Reading Climate Change Partnership and Strategy - Reading Means Business on Climate Change; and
- The Launch of Reading Community Energy Society.

8.2.15 Particularly in terms of transport objectives, this declaration is used by RBC to call on the Government to follow the recommendations of the Committee on Climate Change and radically improve the policy framework to include more national investment in cycling and walking policies, and the expansion of public transport and car clubs using the latest zero carbon technology by working with local businesses.

Reading Borough Council Local Transport Plan 3 2011 – 2026 (April 2012)

8.2.16 The LTP3 Strategy Plan provides the context for Reading in terms of the economy, environment and quality of life. The long-term vision for transport in Reading is the aim of better 'connecting Reading' through a transport system that enables people to move around easily, safely, sustainably and in comfort promoting inclusion, intervention and innovation. This is reflected in the key LTP objectives which are:

- To facilitate more physically active travel for journeys in a healthy environment;
- To improve personal safety on the transport network;
- To provide affordable, accessible and inclusive travel options for everyone;
- To ensure that the transport network operates safely and efficiently to meet the needs of all users;
- To align transport and land use planning to enable sustainable travel choices, improve mobility, reduce the need to travel and preserve the natural environment;
- To deliver balanced packages of value for money transport solutions and make best use of existing transport investment;
- To offer sustainable transport choices for the Travel to Work Area and beyond, integrating within and between different types of transport;
- To improve journey times, journey time reliability and the availability of information; and

- To reduce carbon emissions from transport, improve air quality and create a transport network which supports a mobile, affordable low carbon future.

Technical Standards and Guidance

Reading Borough Council's Geometric Design Guidance for Residential Accesses on to Classified Roads and Commercial Access on to Adopted Roads (June 2011)

- 8.2.17 This document provides information on high standards of highway design when access to development is required from classified roads within RBC, with the aim of not compromising highway safety.
- 8.2.18 The design advice included in this document has been taken into consideration with regard to the proposed site access junction for the development.

IEA Guidelines for the Environmental Assessment of Road Traffic

- 8.2.19 The Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment - IEMA) published Guidelines for the Environmental Assessment of Road Traffic in 1993.
- 8.2.20 This document provides guidelines from the IEA for the assessment of environmental impact of road traffic associated with major new developments. It provides suggested thresholds and considerations for determining the magnitude and significance of environmental impacts, including:
- Severance;
 - Driver Delay;
 - Pedestrian Delay;
 - Pedestrian Amenity;
 - Fear and Intimidation;
 - Accidents and Safety; and
 - Hazardous Loads.
- 8.2.21 The document also provides guidance on alternatives and mitigation, and states that the design team should be aiming to produce an "environmentally friendly" design from the outside, with mitigation measures applied to those impacts which cannot be design out in the initial proposals.

Design Manual for Roads and Bridges

- 8.2.22 The Guidelines for the Environmental Assessment of Road Traffic refer to the Manual of Environment Appraisal (MEA) published by the (then) Department of Transport in 1983. This has been superseded and reference has therefore been made to the relevant sections of the Design Manual for Roads and Bridges (Highways Agency et al) – specifically Volume 11, Section 2, which provides information on the General Principles of Environmental Assessment, including impacts on the population and human health.

- 8.2.23 The Design Manual for Roads and Bridges (DMRB) provides standards, advice notes and other documents relating to the design, assessment and operation of trunk roads.

8.3 Assessment Methodology

Determination of Baseline

- 8.3.1 Baseline data relating to the Site and its surroundings will be collated using the following sources:

- Site visits;
- Desktop studies; and
- Traffic surveys

Site Visits

- 8.3.2 Site visits have been undertaken on several occasions and include:

- Observation of existing conditions on-site;
- Observation of traffic flows and junction operation in both peak and off-peak hours; and
- Walking the Public Rights of Way in the vicinity of the Site.

Desktop Studies

- 8.3.3 Desktop studies include collation of:

- Public transport routes and timetables from operator websites;
- Public Rights of Way from:
 - RBC's GIS data
 - Oxfordshire County Council Interactive Countryside Access Map;
- Local cycle routes, available from Openstreet Map and Sustrans websites;
- Local planning policy documents, available from RBC and SODC's websites; and
- TEMPro growth factors.

Traffic Surveys

- 8.3.4 It was agreed with RBC that the baseline traffic flows will be determined by means of manual classified traffic counts (MCTCs) carried out at six locations on Tuesday 25th June 2019 and automatic traffic counts (ATCs) carried out at 13 locations around the Site from Saturday 22nd to Friday 28th June 2019 inclusive. The traffic surveys are included in Appendix C of the Transport Assessment, included in Appendix 8.1.
- 8.3.5 In order to undertake a robust assessment and assess the cumulative effects of development, growth associated with the planned increase in jobs and housing in the north Reading area has been applied to baseline flows. Growth rates have been obtained

to the anticipated peak construction year (2021) and opening year (2026), in order to provide future baselines in line with the predicted worst-case period of construction and operational traffic, respectively.

Prediction Methodology

Development Traffic Generation

Construction Traffic

- 8.3.6 Peak construction traffic predicted to be generated by the Proposed Development has been calculated using a 'first-principles' approach by Temple.
- 8.3.7 Given the outline nature of the planning application, there is limited information available on the proposed construction works. The transport and access effects of the construction of the Proposed Development would be dependent on various factors including the phasing of construction works and construction processes adopted.
- 8.3.8 The development construction traffic flows, along with 2021 forecast baseline traffic flows will be used to determine the environmental impacts of the development in terms of transport during the construction phase.

Operational Traffic

- 8.3.9 Peak hour traffic flows expected to be generated by the Proposed Development once fully built and occupied have been calculated using the TRICS database (further details set out in the Transport Assessment included in Appendix 8.1).
- 8.3.10 Daily vehicle trip profiles have been extracted for each land use from the TRICS database, for both weekdays and weekends where available, and the calculated peak hour operational traffic flows have been factored to 18-hour AAWT and 24-hour AADT.
- 8.3.11 As discussed previously, the development operational traffic flows, together with the 2026 future baseline traffic flows have been used to determine the environmental impacts of the development in terms of transport during the operational phase.

Receptor Sensitivity

- 8.3.12 The Institute of Environmental Assessment's (IEA) Guidelines¹ identify groups and special interests which should be considered as sensitive receptors, these are:
- People at home;
 - People in workplaces;
 - Sensitive groups including children, the elderly and disabled;
 - Sensitive locations e.g. hospitals, churches, schools, historical buildings;
 - people walking;
 - people cycling;

¹ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

- open spaces, recreational sites, shopping areas;
- sites of ecological / nature conservation value; and
- sites of tourist / visitor attraction.

8.3.13 Categories of receptor sensitivity have been defined from the principles set out in the Guidelines for the Environmental Assessment of Road Traffic², which include the following:

- the need to identify particularly groups or locations which may be sensitive to changes in traffic conditions;
- the list of affected groups and special interests set out in the guidance;
- the identification of links or locations where it is felt that specific environmental problems may occur; and
- such locations “would include accident blackspots, conservation areas, hospitals, links with high pedestrian flows etc.”

8.3.14 These categories have been used to outline in broad terms the sensitivity of receptors to traffic for the categories of impact to be assessed in this chapter, although in detail, each receptor assessed will have a different sensitivity to each specific impact.

8.3.15 High sensitivity receptors include:

- schools, colleges and other educational institutions;
- retirement / care homes for the elderly or infirm;
- roads used by pedestrians with no footways; and
- road safety blackspots.

8.3.16 Medium sensitivity receptors include:

- hospitals, surgeries and clinics;
- parks and recreation areas;
- shopping areas; and
- roads used by pedestrians with narrow footways.

8.3.17 Low sensitivity receptors include:

- open space;
- tourist / visitor attractions;
- historical buildings; and
- churches.

² Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

- 8.3.18 In addition to examples set out in the table above, although not specifically identified within the guidelines as being sensitive for these categories, it is assumed that individual residential areas and employment areas have low sensitivity to these effects.

Impact Magnitude

- 8.3.19 The following environmental effects are considered:

- Severance;
- Driver Delay;
- Pedestrian Delay;
- Pedestrian Amenity;
- Fear and Intimidation;
- Accidents and Safety; and

- 8.3.20 For the purposes of this assessment, cyclists and equestrians have also be considered wherever pedestrians are considered.

- 8.3.21 The transport impacts of the Proposed Development on noise and vibration and air quality will be considered in Chapters 8 and 9. As set out in the Scoping Report, assessment of the effects of the development in terms of hazardous loads and climate change (in terms of transport) have been scoped out, and are therefore not considered further.

Severance

- 8.3.22 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery and is used to describe the factors that separate people from other people and places. For example, severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities.

- 8.3.23 The effects of severance can be applied to motorists, pedestrians or residents. The IEA guidelines³ suggest that changes of traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively. However, there are no predictive formulae which give simple relationships between traffic factors and levels of severance.

- 8.3.24 Volume 11, Section 3, Part 8, Chapter 6 of the Design Manual for Roads and Bridges entitled 'Pedestrians and Others and Community Effects' was referenced within the ES Scoping Note, providing further guidance on the aspect of New Severance within a community. However, this has since been superseded and the table provided in the DMRB chapter is no longer applicable. Therefore, for this assessment, only the IEMA guidelines will be used to assess severance, as set out in **Table 8.1**.

³ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

Table 8.1: Criteria for Determining Impact Magnitude - Severance

Magnitude of Impact	Criteria for Assessing Impact
Major	Change in AADT of 90% or more
Moderate	Change in AADT of between 60% and 90%
Minor	Change in AADT of between 30% and 60%
Negligible	Change in AADT of less than 30%

- 8.3.25 Professional judgement will also be used to assess the impact in terms of severance, to allow consideration of the impact that changes such as traffic speed changes or crossing facility provision may have.

Driver Delay

- 8.3.26 Delays to non-development traffic can occur at several points on the local highway network as a result of the additional traffic that would be generated by a development. The IEA guidelines⁴ state that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. Professional judgement will be used to determine the magnitude of impact in terms of driver delay.

Pedestrian Delay

- 8.3.27 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads, and therefore, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend upon the general level of pedestrian activity, visibility and general physical conditions of the crossing location.
- 8.3.28 Given the range of local factors and conditions which can influence pedestrian delay, the IEA guidelines⁵ do not recommend that thresholds be used as a means to establish the significance of pedestrian delay but recommend that reasoned judgements be made instead. However, the IEA guidelines do note that, when existing traffic flows are low, increases in traffic of around 30% can double the delay experienced by pedestrians attempting to cross a road. Thresholds for impact magnitude are shown in **Table 8.2**.

Table 8.2: Criteria for Determining Impact Magnitude – Pedestrian Amenity

Magnitude of Impact	Criteria for Assessing Impact
Major	Change in average traffic flow over 18 hours of 50+%
Moderate	Change in average traffic flow over 18 hours of 40% - 50%
Minor	Change in average traffic flow over 18 hours of 30% - 40%
Negligible	Change in average traffic flow over 18 hours of less than 30%

Pedestrian Amenity

- 8.3.29 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, it is affected by traffic flow, traffic composition and pavement width / separation from traffic.

⁴ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

⁵ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

The guidance suggests a tentative threshold for judging the significance of changes in pedestrian amenity of where traffic flow (or its lorry component) is halved or doubled. The impact magnitude thresholds set out in **Table 8.3** have been derived based on this and will be used for assessment.

Table 8.3: Criteria for Determining Impact Magnitude – Pedestrian Amenity

Magnitude of Impact	Criteria for Assessing Impact
Major	Change in average traffic flow over 18 hours of 70+%
Moderate	Change in average traffic flow over 18 hours of 60% - 70%
Minor	Change in average traffic flow over 18 hours of 50% - 60%
Negligible	Change in average traffic flow over 18 hours of less than 50%

Fear and Intimidation

- 8.3.30 The scale of fear and intimidation experienced by pedestrians is dependent on the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths, as well as factors such as the speed and size of vehicles
- 8.3.31 There are no commonly agreed thresholds by which to determine the significance of the effect. However, the IEA guidelines⁶ note previous work that has been undertaken which puts forward thresholds that define the degree of hazard to pedestrians by the average traffic flow, 18 hour/day heavy vehicle flow and average speed over an 18-hour day in miles per hour. This is shown below in **Table 8.4**.

Table 8.4: Fear and Intimidation Thresholds

Magnitude of Impact	Average traffic flow over 18 hour day (vehicles per hour two-way)	Total 18 hour HGV flow	Average vehicle speed over 18 hour day (mph)
Major	>1,800	>3,000	>20
Moderate	1,200 – 1,800	2,000 – 3,000	15 – 20
Minor	600 – 1,200	1,000 – 2,000	10 – 15
Negligible	<600	<1,000	<10

- 8.3.32 It is noted that the majority - if not all – links likely to be included for assessment would have average baseline vehicle speeds over an 18-hour day of in excess of 20mph. Any assessment of levels of Fear and Intimidation based on this aspect would therefore show no change. Instead, a judgement will be made, with reference to all three conditions.

Accidents and Safety

- 8.3.33 The IEA guidelines⁷ suggests that professional judgement should be used to assess the implications of local circumstances or factors which may elevate or lessen risks of accidents, such as junction conflicts.

⁶ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

⁷ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

Effect Significance

- 8.3.34 The two principal criteria for determining the significance of an environmental effect are the sensitivity of the receptor and magnitude of impact. These have been taken into account within this assessment based on **Table 8.5**.

Table 8.5: Effect Significance Matrix

Magnitude	Sensitivity or Value		
	High	Medium	Low
Major	Major adverse / beneficial	Major-moderate adverse / beneficial	Moderate-minor adverse / beneficial
Moderate	Major-moderate adverse / beneficial	Moderate-minor adverse / beneficial	Minor adverse / beneficial
Minor	Moderate-minor adverse / beneficial	Minor adverse / beneficial	Minor-negligible
Negligible	Negligible	Negligible	Negligible

Geographical Scope

- 8.3.35 As stated previously, the DMRB guidance set out within the ES Scoping Note is no longer applicable and therefore has not been used to scope out any links within the assessment area.
- 8.3.36 The Guidelines for the Environmental Assessment of Road Traffic⁸ provides a general rule that can be used as a screening process to establish the extent of the assessment. The proposed study area for the transport and movement assessment will comprise links using these rules:
- 'Rule 1 - Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
 - Rule 2 - Include any other specifically sensitive areas where traffic flows have increased by 10% or more'.
- 8.3.37 2019 baseline 18-hour average annual weekday traffic (AAWT) and 24-hour average annual daily traffic (AADT) flows for roads surrounding the site have been calculated using the traffic survey data.

⁸ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

Table 8.6: Average Two-Way Daily Traffic Flows

Link	Existing Baseline (2019)		Future Baseline without Proposed Development (2026)		Future Year with Proposed Development at Full Occupation (2026)		% Impact of Proposed Development on All Traffic
	AADT (All Traffic)	HGV %	AADT (All Traffic)	HGV %	AADT (All Traffic)	HGV %	
Kidmore End Road N	926	6%	973	6%	1070	5%	9%
Kidmore End Road S	2451	6%	2574	6%	4245	4%	39%
Peppard Road N	11329	6%	11861	6%	11907	6%	0%
Kiln Road	2502	6%	2628	6%	2783	5%	6%
Caversham Park Road	5651	5%	5935	5%	6213	5%	4%
Peppard Road Central	11897	6%	12456	6%	12896	6%	3%
Buckingham Drive	16373	5%	17142	5%	18027	5%	5%

Table 8.7: Average Two-Way Weekday Traffic Flows

Link	Existing Baseline (2019)		Future Baseline without Proposed Development (2026)		Future Year with Proposed Development at Full Occupation (2026)		% Impact of Proposed Development on All Traffic
	AAWT (All Traffic)	HGV %	AAWT (All Traffic)	HGV %	AAWT (All Traffic)	HGV %	
Kidmore End Road N	925	6%	971	6%	1044	6%	7%
Kidmore End Road S	2508	7%	2634	7%	4014	5%	34%
Peppard Road N	12115	7%	12684	7%	12719	7%	0%
Kiln Road	2675	6%	2809	6%	2926	6%	4%
Caversham Park Road	6002	6%	6304	6%	6524	6%	3%
Peppard Road Central	12546	6%	12371	6%	13477	6%	3%
Buckingham Drive	17145	6%	17951	6%	18660	5%	4%

8.3.38 Based on the above geographical scope and calculated flows, the assessment area comprises Kidmore End Road (S) only, shown in **Figure 8.1**:

Figure 8.1: Geographical Scope of Assessment



Temporal Scope

8.3.39 This assessment has considered likely effects during the construction and operation of the Proposed Development. The temporal scope of the transport and movement assessment is proposed to be:

- Construction of Proposed Development – construction of the Proposed Development is anticipated to begin in 2021, subject to obtaining relevant planning consents, and the peak construction impact in terms of traffic and transport is expected to be in this year. Therefore, construction effects of the Proposed Development have been assessed for the peak construction year of 2021; and
- Completion of Proposed Development – the development is anticipated to be completed in 2026, and therefore operational effects are assessed for this year

8.3.40 Further detail on the collection of future year predicted flows to inform the assessment is outlined below.

Assessment Scenarios

8.3.41 The Proposed Development is anticipated to be complete and fully operational by 2026. The operational assessment compares predicted traffic flows in 2026 without the Proposed Development, with predicted traffic flows in 2026 with the implementation of the Proposed Development. This has allowed the effect of the Proposed Development to be

identified and assessed, separate to increases in background traffic that are not associated with the Proposed Development.

- 8.3.42 Expected operational trip generation from the Proposed Development was calculated using the TRICS database, while background traffic growth was determined using TEMPro 7.2 and the National Transport Mode AF15 dataset (full details of these processes can be found in the Section 7 of the TA).
- 8.3.43 In summary, the following scenarios, considered within the TA, have been used to inform this assessment:
- Future baseline (without Proposed Development) (2026);
 - Assessment of peak construction effects (2021); and
 - Assessment of operational effects (all construction complete; the Proposed Development fully occupied and operational) (2026).

Limitations and Assumptions

- 8.3.44 It is anticipated that construction of the Proposed Development will commence in 2021, with completion expected to be in 2026.
- 8.3.45 The peak construction traffic environmental impact is expected during construction of the site access and first phase of housing of the Proposed Development.
- 8.3.46 The construction traffic has been determined on the basis of the number of operatives and management staff required on site and the material quantities to be imported through the duration of the works. It is anticipated that there will be 5-10 two-way HGV movements per day during the normal construction phase, with 10-25 two-way HGV movements anticipated during the day during the initial development phase.
- 8.3.47 This construction traffic will be routed via strategic roads to avoid the use of more sensitive roads. This will be managed through the implementation of a Construction Environmental Management Plan that will stipulate construction traffic routes and times. Contractors working on the Site will have to comply with this during construction.
- 8.3.48 The construction process will require work to be undertaken in several different areas at the same time utilising a range of skills from general labourers and skilled operatives through to professionals and managers. It is envisaged that workers are likely to originate from a variety of areas and that some will travel together to and from the Site.
- 8.3.49 Given typical working hours on a construction site, construction worker trips are likely to occur outside the peak hours, i.e. before 08:00 and after 18:00. Similarly, HGV traffic will travel to the Site outside the peak hours i.e. between 09:30 and 16:30. Therefore, the construction phase is not expected to have an impact on the local road network during the peak hours.
- 8.3.50 Based on the above assumptions, it is estimated that the peak construction period would require up to 40 operative and management staff on the Site. Based on Stantec's experience of similar developments, a number of these trips will be shared because of the distances travelled by operative and the fact that they often travel together from their depots rather than from home. On this basis, we have estimated that a workforce of 40

would equate to 30 vehicle trips arriving before 08:00 and leaving after 18:00. These times will vary however, because of the reduced hours of daylight in the winter.

8.3.51 In summary, as a worst-case assessment, the total construction traffic generated will be:

- 30 vehicle trips of the employees, before and after peak hours (before 08:00 and after 18:00, subject to the time of year); and
- 25 two-way HGV trips per day

Consultation

8.3.52 A formal Scoping Opinion request was issued to RBC on 13th February 2020. Comments were received on 15th April 2020 where there was no objection to the proposed traffic and transport scoping note that this assessment has been based on.

8.4 Baseline Assessment and Identification of Key Receptors

Existing Pedestrian, Cycle and Equestrian Network

8.4.1 The Site is located in a residential area with a network of streets with footways and footpaths providing access to local facilities.

Public Rights of Way (PRoWs)

8.4.2 At present, no PRoWs run through the Site. However, Footpath 22 runs along Milestone Way between Peppard Road approximately 300m south of the Site's access, and Footpath 205/10/10 in South Oxfordshire District Council (SODC), approximately 230m north of St Martins Catholic Primary School.

8.4.3 Additionally, footpath 266/12/10 in SODC runs between Highdown Hill Road (Path) and connects with Bridleway 266/17/10 approximately 275m to the southwest; Bridleway 266/17/10 connects with Bridleway 16 in Reading Borough Council and Hemdean Road further south, and Tanners Lane in SODC to the north.

Local Cycle Network

8.4.4 Reading Borough Council (RBC) branded cycle routes R40 and R41 provide a connection to Reading Station and Town Centre. The station is 3.3km from the Site and can be reached in approximately 15-minutes by bicycle and therefore is a realistic alternative to the car. National Cycle Route 5 passes through the north of the Golf Course and provides a connection for leisure cycling towards Oxford. RBC's local cycle route maps have been included in Appendix B of the TA for reference.

Public Transport

Bus Services

8.4.5 The Site has good public transport accessibility with bus services 23 and 24 routing along Kidmore End Road adjacent to the Site and service 25 routing along Peppard Road. Bus stops for services 23 and 24 are located nearby the Site access. The nearest bus stop to the Site for service 25 lies approximately a four-minute walk from the site, near Emmer Green local centre along Peppard Road. The services provided are summarised below in **Table 8.9**.

Table 8.9: Existing Bus Services

Stop	Service No.	First Service	Last Service	Destination	Week day Frequency (minutes)	Weekend Frequency (minutes)
Calgrove Way	23	05:46	23:46	Friar Street	23-30	30
	24	05:27	23:22	Friar Street	27-35	30
Cavendish Road	25	06:00	20:39	Central Reading	25-31	20-60
	25	06:00	20:42	Peppard Common	30	60

Rail Services

- 8.4.6 Reading Station is located 3.5km to the south of the Site and provides fast and frequent services into Oxford, Basingstoke, London Paddington and other railway stations in London, and the wider regions. Reading Station provides ample secure bike storage with CCTV in operation.
- 8.4.7 The Elizabeth Line, currently under construction, will provide further connections between Reading and London. Elizabeth Line stopping services are now operating between London Paddington and Reading, ahead of the full scheme due to be completed in 2021, providing enhanced services from Reading through to eastern London. These new services will be accessible via cycling and bus services.

Highway Network

Kidmore End Road

- 8.4.8 Kidmore End Road is a single carriageway local distributor road with one lane of traffic per direction, which runs immediately east of the Site in a north-south direction and currently provides access to the Site. No parking restrictions apply along Kidmore Road in the vicinity of the Site and a speed limit of 30mph operates along the road.
- 8.4.9 A footway is provided on the western side of Kidmore End Road, which is generally 1.5m wide and is segregated from the main carriageway by means of a 2.5m-wide grass verge. A grass verge of similar width is also provided on the eastern side of the road, however there is no footway provision on this side. Moreover, lighting is provided along Kidmore End Road by means of street lamps along the western side of the road.

Peppard Road

- 8.4.10 Approximately 300m south of the Site access, Kidmore End Road connects with Peppard Road by means of a priority junction. Peppard Road is a single carriageway main distributor road which provides direct access to Emmer Green in the north and Caversham and Reading Town centre in the south. Double yellow lines indicate 'no parking at any time' restrictions along the road.

- 8.4.11 Footways of between 2.5-3.5m in width and street lighting are provided on both sides of Peppard Road. Additionally, a pelican crossing is provided approximately 30m south of the junction, which facilitates pedestrian movement across the road.

Personal Injury Collisions

- 8.4.12 Stantec has obtained personal injury data covering the highway network surrounding the Site and of the junctions in the study area for the three-year period from 1st October 2016 to 30th September 2019. This information was obtained from RBC and is presented in Appendix D of the TA, included in Appendix 8.1.
- 8.4.13 The collisions are classified into three categories: slight, serious and fatal, a definition of which is provided below:
- 8.4.14 **Slight Injury:** Injuries of a minor nature, such as sprains, bruises, or cuts not judged to be severe, or slight shock requiring only roadside attention (medical treatment is not a prerequisite for an injury to be defined as slight);
- 8.4.15 **Serious Injury:** Injuries for which a person is detained in hospital, as an in-patient, or any of the following injuries, whether or not a person is detained in hospital; fractures, concussion, internal injuries, severe cuts and lacerations, severe general shock requiring medical treatment and injuries which result in death 30 days after the accident. The serious category, therefore, covers a very broad range of injuries; and
- 8.4.16 **Fatal Injury:** Injuries which cause death either immediately or any time up to 30 days after the accident.
- 8.4.17 The personal injury data has been analysed to understand if there are any existing safety issues in the proposed study area that may be adversely affected by the development proposals. The table below provides a summary of the collision data within the study area.

Table 8.10: Accident Data Summary

Severity of Casualty	Year			
	1	2	3	Total
Total				
Fatal	0	0	0	0
Serious	0	0	1	1
Slight	2	2	7	11
Total	2	2	8	12
Pedestrians				
Fatal	0	0	0	0
Serious	0	0	0	0
Slight	0	0	2	2
Total	0	0	2	2
Cyclists				
Fatal	0	0	0	0
Serious	0	0	1	1
Slight	0	1	1	2
Total	0	1	3	3

- 8.4.18 During the 36-month period between 1st October 2016 to 30th September 2019, there were 12 collisions resulting in 1 (8%) serious injuries and 11 (93%) slight injuries.
- 8.4.19 Of the accidents recorded within the 36-month time period, 5 (42%) accidents involved vulnerable road users (2 accidents involving pedestrians and 3 involving cyclists). Further analysis of these accidents concludes that each of these accidents was caused by driver error.
- 8.4.20 Following a detailed review of the data, no accidents appear to have been caused by highway layout and there are no clusters or accident blackspots.

Identification of Key Receptors

- 8.4.21 The local area has been studied for sensitive receptors along the link included within the assessment area (Kidmore End Road S). The receptors are identified in **Table 8.11**.

Table 8.11: Receptor Descriptions and Sensitivity Ratings

Receptor Reference and Link	Receptor Description	Sensitivity/value of a Receptor
R1.1	Residential properties	Low
R1.2	Narrow footway	Medium
R1.3	Emmer Green Playing Fields	Medium
R1.4	Local pubs and restaurants	Medium

Figure 8.2: Location of Identified Receptors with Geographical Scope of Assessment



8.5 Identification and Description of Changes Likely to Generate Effect

- 8.5.1 The elements of the Proposed Development during the construction and operational phases that are likely to generate traffic & transport-related effects are identified and summarised below, based upon information set out in the 'Prediction Methodology' section.

Construction Phase

Severance

- 8.5.2 No significant effects are expected in terms of severance during this phase; it is expected that the total construction traffic generated during the peak construction year will be 60

two-way construction worker vehicle trips per day and 25 two-way HGV trips per day. Therefore, it is considered that the Proposed Development is unlikely to generate significant traffic flows during the construction stage.

Driver Delay

- 8.5.3 Construction of the proposed site access points is likely to cause adverse effects in terms of driver delay along Kidmore End Road S. However, these effects will be both localised and temporary.

Pedestrian Delay

- 8.5.4 No significant effects are expected in terms of pedestrian delay, as the Proposed Development is unlikely to generate significant traffic flows during the construction stage.

Pedestrian Amenity

- 8.5.5 No significant effects are expected in terms of pedestrian amenity as traffic flows generated in the construction stage are unlikely to be significant.

Fear and Intimidation

- 8.5.6 Although the Proposed Development will generate HGV trips, it is anticipated that these will comprise a total of 10 to 25 HGV movements per day during the peak construction period. Therefore, no significant effects are expected in terms of fear and intimidation.

Accidents and Safety

- 8.5.7 Traffic flows generated in the construction phase are not likely to be significant to the extent that there would be a significant effect on accidents and safety.

Operational Phase

Severance

- 8.5.8 There is the potential the increased traffic flows along Peppard Road may cause an increase in severance between Emmer Green and the A4155 Henley Road, which may lead to a permanent adverse effect.

Driver Delay

- 8.5.9 There is the potential for driver delay to be increased, particularly at junctions in the vicinity of the Site. However, this is likely to be in the peak hour only and therefore is unlikely to constitute a significant effect.

Pedestrian Delay

- 8.5.10 Increases in traffic flows, particularly along Peppard Road, may cause an increase in pedestrian delay which may lead to a permanent adverse effect.

Pedestrian Amenity

- 8.5.11 It is considered that changes in traffic flows along links used by pedestrians will not be such that there are significant effects in terms of pedestrian amenity.

Fear and Intimidation

- 8.5.12 The development is unlikely to generate significant HGV movements, however there may be effects on fear and intimidation due to increases in total traffic flow on some links which may lead to a permanent adverse effect.

Accidents and Safety

- 8.5.13 Changes in flow on the surrounding links are unlikely to be large enough to have a significant effect on accidents and safety. Crossing improvements delivered as part of the Proposed Development could lead to improvements in safety.

8.6 Assessment of Likely Significant Effect

- 8.6.1 The likely significant environmental effects resulting from the Proposed Development during both construction and operation have been assessed using the future baseline and development AADT and AAWT traffic flows shown in Section 8.3.

Construction Phase

Embedded Mitigation Measures

- 8.6.2 A Construction Environmental Management Plan (CEMP) is being prepared by Temple. and will outline the construction arrangements to adopt in order to reduce the environmental effects of construction.

Anticipated Effects

Severance

- 8.6.3 The expected increase in traffic flow during the peak construction year is significantly lower than 30% - the threshold at which severance impacts are discernible. Therefore the magnitude of impact in terms of severance is considered to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Driver Delay

- 8.6.4 Comprehensive transport modelling has been undertaken for the junctions within the assessment area to understand the implications of construction traffic during the peak construction year of the Proposed Development.
- 8.6.5 It is expected that the total construction traffic generated during the peak construction year will be 60 two-way construction worker vehicle trips per day and 25 two-way HGV trips per day. It is anticipated that construction traffic trips will occur outside of peak hours. Based on this, peak construction year traffic will have a negligible impact on driver delay. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Pedestrian Delay

- 8.6.6 An increase in traffic flow of around 30% can double the delay experience by pedestrians attempting to cross the road. The expected traffic flow during the peak construction year on Kidmore End Road S is below this threshold, and therefore the impact on pedestrian delay is considered to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Pedestrian Amenity

- 8.6.7 Increases on traffic flows are expected to be below 50% - the threshold at which significant impacts on pedestrian amenity are seen. Therefore the impact in terms of pedestrian amenity is considered to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Fear and Intimidation

- 8.6.8 The total baseline 18 hour HGV flow on Kidmore End Road S is below 1,000, and the HGV traffic generated during the peak construction period is not expected to breach this threshold. In addition, the impact of general traffic is very low, and not expected to result in a step-change in traffic levels. Based on this, the Proposed Development is considered to have a negligible impact on Fear and Intimidation. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Accidents and Safety

- 8.6.9 The analysis of accident data has shown only a limited number of collisions in the area surrounding the Site, with all accidents recorded due to driver error and no accident blackspots identified.
- 8.6.10 The anticipated increases in traffic flow along Kidmore End Road S during the construction period are very low, and are therefore expected to have only a negligible impact on accidents and safety. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Embedded Mitigation Measures

- 8.6.11 The masterplan has been designed using the appropriate design standards and legislation. The Proposed Development will encourage walking and cycling within the Site as well as to surrounding local facilities by providing a 3m wide cycleway along the main street and informal pedestrian footpaths within open space. The masterplan provides a well-connected movement network, designed to prioritise pedestrian, cyclist and public transport movement over the car wherever possible.
- 8.6.12 A Residential Travel Plan will be implemented for the Proposed Development in line with the National Planning Policy Framework.
- 8.6.13 A raised informal crossing, comprising a flat-top speed hump with a Duratherm herringbone imprint, is proposed on Kidmore End Road, Lyefield Court at its junction with Kidmore End Road, and on Grove Road at its junction with Kidmore End Road. Traffic calming measures such as these can improve traffic safety at the junction by slowing vehicles down when entering and exiting the junction as well as increasing visibility of pedestrians to other road users. These informal crossings will be provided with tactile paving to facilitate the crossing of visually impaired pedestrians.
- 8.6.14 A concept drawing of the proposed pedestrian improvements is shown in Drawing 45675/5501/008 included in the TA.
- 8.6.15 Despite the modelling predicting that the current design can accommodate traffic generated by the Proposed Development, a mini roundabout arrangement has been designed to help better manage traffic flows and provide a form of traffic calming around

the Emmer Green local centre and signalised pedestrian crossing on Peppard Road. Drawing 45675/5501/007 included within the TA shows the proposed mini roundabout. A herringbone imprint is proposed at the existing informal crossing point on Kidmore End Road north of the roundabout.

Operational Phase

Anticipated Effects

Severance

- 8.6.16 On Kidmore End Road S, at receptors 1.1, 1.2, 1.3 and 1.4, the Proposed Development is expected to result in a 39% increase in two-way AADT flows. However, to reduce severance in this location, the Proposed Development includes a new crossing of Kidmore End Road S, to the north of Grove Road, which will improve access to the Emmer Green local centre for new residents at the development, and provide an improved walking route to the south towards Highdown School via Grove Road for residents on the eastern side of Kidmore End Road.
- 8.6.17 The overall impact of the Proposed Development is therefore expected to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Driver Delay

- 8.6.18 Comprehensive transport modelling has been undertaken and validated for the junctions and on-street parking within the assessment area to understand the implications of the proposed development on traffic. The modelling assessment has established that the increased traffic flow from the Proposed Development will have a negligible impact on the junctions within the study area. The overall effect is therefore considered to be **negligible** on all sensitive receptors.
- 8.6.19 Detailed modelling results can be found in Chapter 7 of the TA.

Pedestrian Delay

- 8.6.20 An increase in traffic flow of around 30% can double the delay experienced by pedestrians attempting to cross the road. A 39% increase in traffic flow is expected on Kidmore End Road S, although the overall level of traffic using the link daily remains low at 4,198 vehicles per day AADT. To reduce pedestrian delay, the Proposed Development includes a new crossing of Kidmore End Road S, to the north of Grove Road, which will improve access to the Emmer Green local centre for new residents at the development, and provide an improved walking route to the south towards Highdown School via Grove Road for residents on the eastern side of Kidmore End Road.
- 8.6.21 Overall therefore, there is considered to be a negligible impact in terms of pedestrian delay. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Pedestrian Amenity

- 8.6.22 Increases on traffic flows are expected to be below 50% - the threshold at which significant impacts on pedestrian amenity are seen. Therefore the impact in terms of pedestrian amenity is considered to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Fear and Intimidation

- 8.6.23 The total baseline 18 hour HGV flow on Kidmore End Road S is below 1,000, and the HGV traffic generated during the peak construction period is not expected to breach this threshold. In addition, the impact of general traffic is very low, and the hourly average traffic flow on the road is expected to be 221 vehicles, which is significantly below the significance threshold of 600 vehicles. Based on this, the Proposed Development is considered to have a negligible impact on Fear and Intimidation. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

Accidents and Safety

- 8.6.24 The analysis of accident data has shown only a limited number of collisions in the area surrounding the Site, with all accidents recorded due to driver error and no accident blackspots identified.
- 8.6.25 The anticipated increases in traffic flow along all links are low in absolute terms, and are therefore expected to have only a negligible impact on accidents and safety. The development is likely to lead to an increase in demand to cross Kidmore End Road S, however a new crossing of the road is proposed, providing benefit to new residents at the Proposed Development and existing residents in surrounding residential areas. Therefore the overall impact in terms of accidents and safety is expected to be negligible. The overall effect is therefore considered to be **negligible** on all sensitive receptors.

8.7 Scope for Additional Mitigation Measures

- 8.7.1 Based on the above assessment, no additional mitigation is required to support the Proposed Development.

8.8 Residual Effects

- 8.8.1 No significant residual effects in terms of traffic and transport have been identified.

8.9 Cumulative Effects

- 8.9.1 Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 8.9.2 There are three committed development sites within 2 km of the Site that RBC have requested to be included within the assessment: 180418 Henley Road, 190835 Henley Road and 140997 St Martins Precinct. Impacts from these developments are assumed to be included within the TEMPRO growth factors used in the TA to determine a future baseline for assessment.
- 8.9.3 There are also a number of schemes just outside this boundary which have been included for the purposes of the cumulative assessment.
- 8.9.4 The cumulative development schemes identified in **Table 8.12** took account of major developments likely to generate significant inter-project effects, and include:
- Approved but uncompleted projects (i.e. unimplemented or under construction); and

- Projects for which an application has been made and which are under consideration by the consenting authorities.

Table 8.12: Committed Developments Considered for Assessment

No	Development	Planning App Ref	Summary of Development	Approval Date	Planning Status
1	SSE, Vastern Road	190451	Land at Vastern Road, Reading, involving demolition of a number of structures on the site and the erection of a new residential scheme (up to 210 units), with a max height of 11 storeys (up to 36m above ground level) including a new north south pedestrian link, connecting Christchurch Bridge to Vastern Road towards the station as well as drainage infrastructure and landscaping.	09/05/19	At scoping stage
2	Broad Street Mall, Broad Street, Reading RG1 7QG	182137	Construction of three residential buildings (Use Class C3) ranging in height from 5 to 22 storeys above Broad Street Mall (Site E to provide up to 50 units, Site B to provide up to 134 Units and Site A to provide up to 164 units) and provision of a podium level amenity area, Construction of a 16 storey building on South Court comprising ground and first floor retail(Use Class A1/A2/A3) and residential over upper floors (Use Class C3, Site C to provide up to 98 units), Creation of ground floor retail units (Use Class A1/A3/A4) fronting Dusseldorf Way and ground floor retail (Use Class A1/A2/A3)		Submitted
3	71 – 73 Caversham Road, Reading, RG1 8JA	191792	Demolition of former retail warehouse and erection of a new part 1, part 5, part 7 storey mixed-use building comprising 44 residential units, 239 sqm of retail floorspace (Use Class A1) at ground floor and associate car parking, cycle parking and landscaping.		Submitted
4	199 – 203 Henley Road and land to the Rear of 205 – 207 Henley Road, Caversham, Reading, RG4 6LJ	190835	Demolition of 199-203 Henley Road and erection of part four, part three and part two storey 82 unit residential care home building (C2 use class) with associated external structures, access from Henley Road, car parking and landscaping.	19/12/19	Granted
5	St Martins Precinct, Church Street	140997	Redevelopment for retail, restaurant, leisure and residential (40 dwellings).		Granted

- 8.9.5 Construction traffic associated with these committed developments is unlikely to come from north of the Site through Caversham and therefore there are not expected to be any significant cumulative effects in terms of construction.
- 8.9.6 Each of these committed developments have identified transport strategies in order to mitigate the impacts of development. These include highway improvements and the provision of pedestrian and cycle infrastructure to promote the use of sustainable transport and mitigate increases in driver delay in the peak hours.
- 8.9.7 Developments 1, 2 and 3 are located nearby Reading town centre within close proximity to several public transport connections. Therefore, there is expected to be little increase in vehicle trips on the highway network, particularly in the vicinity of the site. Development 4 is located on Henley Road, south of the Proposed Development. This development is expected to result in a net reduction of two-way vehicle movements compared with an already permitted 42-unit residential scheme. As the developments assessed are located further than 1km from the Site, and each have a variety of local amenities nearby (closer than those near to the Proposed Development), there is expected to be a negligible impact on pedestrian delay and pedestrian amenity for pedestrians travelling in areas surrounding the Site.
- 8.9.8 Therefore, there are not expected to be any significant cumulative effects as a result of these developments.

8.10 Summary and Conclusions

Summary of Baseline

- 8.10.1 The Site is located in a residential area with a well-connected network of streets with footways and footpaths providing access to local facilities, including Emmer Green local centre located an approximately 5-minute walk from the Site. RBC cycle routes provide connections to Reading Station and Town Centre.
- 8.10.2 The Site has good public transport accessibility to bus and rail services, with bus stops located adjacent to the Site, and Reading Rail Station located 3.3km south of the Site.
- 8.10.3 The existing highway network surrounding the Site consists of single carriageway roads with footways and street lighting. Accident data obtained within the most recent 36-month time period shows that of the accidents recorded surrounding the Site, no accidents appear to have been caused by highway layout and there are no clusters or accident blackspots.
- 8.10.4 Traffic surveys were undertaken, and an assessment area determined based on the anticipated development traffic impact. This comprises seven links and junctions. Sensitive receptors along these links have been identified and their sensitivity calculated based on their relative importance and their ability to accommodate change and / or recover from impacts.

Summary of the Methodology and Consultation

- 8.10.5 Peak construction traffic predicted to be generated by the Proposed Development has been calculated using a 'first-principles' approach. This has been based on the likely worst-case scenario.

- 8.10.6 Peak hour traffic flows expected to be generated by the Proposed Development once fully built and occupied have been calculated based on survey data for similar developments and used to determine the environmental impacts of the development in terms of transport during the operational phase.
- 8.10.7 The following environmental effects have been considered within the assessment, using IEA guidelines⁹.
- Severance;
 - Driver Delay;
 - Pedestrian Delay;
 - Pedestrian Amenity;
 - Fear and Intimidation; and
 - Accidents and Safety;
- 8.10.8 Environmental effects have been determined for both the construction phase and operational phase of the Proposed Development.

Consultation

- 8.10.9 A formal Scoping Opinion request was issued to RBC on 13th February 2020. Comments were received on 15th April 2020 where there was no objection to the proposed traffic and transport scoping note that this assessment has been based on.

Summary of Impacts

Construction Phase

- 8.10.10 The Proposed Development is not expected to have any significant impacts in terms of traffic and transport during the construction phase.
- 8.10.11 A Construction Environmental Management Plan will set out traffic arrangements and management practices to adopt in order to reduce the environmental effects of construction.

Operational Phase

- 8.10.12 The Proposed Development is not expected to have any significant impacts in terms of traffic and transport during the operational phase.
- 8.10.13 The Proposed Development will encourage walking and cycling within the Site as well as to surrounding local facilities by providing a cycleway along the main street and informal pedestrian footpaths within open space. A Residential Travel Plan will be implemented for the Proposed Development in line with the National Planning Policy Framework.
- 8.10.14 The Proposed Development includes a new crossing of Kidmore End Road, to the north of Grove Road, which will improve access to the Emmer Green local centre for new

⁹ Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic 1993

residents at the development, and provide an improved walking route to the south towards Highdown School via Grove Road for residents on the eastern side of Kidmore End Road.

- 8.10.15 A mini roundabout arrangement has been designed at the junction of Kidmore End Road and Peppard Road to help better manage traffic flows and provide a form of traffic calming around the Emmer Green local centre and signalised pedestrian crossing on Peppard Road. An imprinted crossing is proposed at the exiting informal crossing point located on Kidmore End Road.

Cumulative Effects

- 8.10.16 No significant impacts in terms of traffic and transport are expected in either the construction or operations phase as a cumulative result of development.

Summary of Mitigation and Residual effects.

- 8.10.17 No significant environmental effects in terms of traffic and transport are expected as a result of the Proposed Development, in either the construction or operational phase.

Concluding Statement

- 8.10.18 The assessment included within this Chapter demonstrate that no significant environmental impacts in terms of traffic and transport are expected as a result of the Proposed Development.
- 8.10.19 **Table 8.13** summarises the topic effects resulting from the Proposed Development.

Table 8.13: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Signifi- ce) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Construction								
R1.1 Residential properties	Low	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Temporary Likely				
R1.2 Narrow footway	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Temporary Likely				
R1.3 Emmer Green Playing Fields	Medium	Increases in traffic flow leading to changes in severance, driver delay,	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Temporary Likely				

		pedestrian delay, pedestrian amenity and accidents and safety.						
R1.4 Local pubs and restaurants	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Temporary				
				Likely				
Operation								
R1.1 Residential properties	Low	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	Delivery of new pedestrian crossing on Kidmore End Road. Provision of mini-roundabout at Kidmore End Road / Peppard Road junction.	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				
R1.2 Narrow footway	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay,	Delivery of new pedestrian crossing on Kidmore End Road. Provision of mini-	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				

		pedestrian amenity and accidents and safety.	roundabout at Kidmore End Road / Peppard Road junction.					
R1.3 Emmer Green Playing Fields	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	Delivery of new pedestrian crossing on Kidmore End Road. Provision of mini-roundabout at Kidmore End Road / Peppard Road junction.	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				
R1.4 Local pubs and restaurants	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	Delivery of new pedestrian crossing on Kidmore End Road. Provision of mini-roundabout at Kidmore End Road / Peppard Road junction.	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				
Cumulative Effects - Construction								
R1.1 Residential properties	Low	Increases in traffic flow leading to changes in severance, driver delay,	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Temporary				
				Likely				

		pedestrian delay, pedestrian amenity and accidents and safety.						
R1.2 Narrow footway	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible Direct Local Temporary Likely	Negligible	None	Negligible	Negligible
R1.3 Emmer Green Playing Fields	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible Direct Local Temporary Likely	Negligible	None	Negligible	Negligible
R1.4 Local pubs and restaurants	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and	None	Negligible Direct Local Temporary Likely	Negligible	None	Negligible	Negligible

		accidents and safety.						
Cumulative Effects - Operation								
R1.1 Residential properties	Low	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				
R1.2 Narrow footway	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				
R1.3 Emmer Green Playing Fields	Medium	Increases in traffic flow leading to changes in severance, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				

R1.4 Local pubs and restaurants	Medium	Increases in traffic flow leading to changes in severe, driver delay, pedestrian delay, pedestrian amenity and accidents and safety.	None	Negligible	Negligible	None	Negligible	Negligible
				Direct				
				Local				
				Permanent				
				Likely				