7 Traffic and Transportation

7.1 Introduction

7.1.1 This Chapter assesses the effect of the Proposed Scheme on traffic and transportation. In particular, it considers the potential effects of the Proposed Scheme in terms of changes in traffic flow volume and composition in relation to severance, driver stress and delay, pedestrian delay, pedestrian and cyclist amenity and fear and intimidation.

7.1.2 This Chapter (and its associated figures and appendices) is not intended to be read as a standalone assessment and reference should be made to the Front End of this ES (Chapters 1 – 6), as well as Chapter 19 – Cumulative Effects. The Transport Assessment (TA) submitted alongside the detailed planning application should also be referred to.

7.1.3 This Chapter has been prepared in line with guidance specified in the Institute of Environmental Management and Assessment (IEMA) guidelines entitled ‘Guidance for Environmental Assessment of Road Traffic’ (2003) (Ref. 7.1) and the Design Manual for Roads and Bridges (DMRB) (Ref. 7.2).

7.2 Legislation, Policy and Guidance

Legislative Framework

7.2.1 The main referencing source for all Transport and Traffic Assessments for developments is the Department for Transport’s (DfT) 2007 ‘Guidance on Transport Assessments’ document (Ref. 7.3). At present, there is no specific legislation available in relation to transport and traffic assessments in ESs.

Planning Policy

7.2.2 Planning policy at the national, regional, county and local level and its relevance to environmental design and assessment is discussed in (Chapter 6 – Environmental Planning Policy and Context). The TA for the Proposed Scheme accompanying the planning application provides a comprehensive review of relevant policy. A more succinct policy review in specific relation to the assessment of traffic and transportation effects is provided below.

National Planning Policy Framework

7.2.3 The National Planning Policy Framework (NPPF) (Ref. 7.4) was published on 27 March 2012 and is a key part of the reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. There is an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision.

7.2.4 The NPPF consolidates all of the previous Planning Policy Statements (PPSs) and Planning Policy Guidance Notes (PPGs) into one document. The NPPF discusses a variety of transport priorities, such as the need for a balance in favour of sustainable travel modes and that people need to be given a real choice in how to travel. However, of most significance to the assessment is when the NPPF states that:

‘Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe’
7.2.5 The NPPF also states that encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. The Proposed Scheme aims to help alleviate the existing traffic congestion problem on the A45.

**National Planning Practice Guidance (NPPG)**

7.2.6 Since the release of the NPPF (Ref. 7.4), the government has recently released supplementary guidance in order to make policy guidance more accessible.

7.2.7 With regards to Transport, there is guidance for ‘Travel Plans, Transport Assessments and Statements in decision making’ (Ref. 7.5).

7.2.8 Although not directly focused on the production of an ES, the guidance does make brief reference to considering traffic effects within EIA. It is stated that:

‘Particular attention should be given to this issue where there are environmentally sensitive areas nearby and where the proposal could have implications for breach of statutory thresholds in relation to noise and air quality either as a result of traffic generated by the site or as a consequence of the impact of existing traffic on the site under consideration’.

7.2.9 This Chapter has therefore been prepared accordingly taking into consideration the NPPG.

**Local Transport White Paper**

7.2.10 The Local Transport White Paper titled ‘Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen’ (Ref 7.6) was published by DfT in January 2011. There are four key statements of importance, and these are as follows:

- ‘Our vision is for a transport system that is an engine for economic growth, but one that is also greener and safer and improves quality of life in our communities’;
- ‘Encouraging sustainable local transport choices depends on local solutions’;
- ‘The Government has already taken significant steps to hand back responsibility for developing local solutions in planning and the economy to the local level’; and
- ‘We also recognised that there are some initiatives that benefit from a single national approach’.

7.2.11 The Government considers that investment in transport is not enough in itself but that measures need to be put in place enabling people to make the right transport choices.

7.2.12 The paper also advocates the decentralisation of power to the more local level and to enable local delivery of schemes and measures. A number of funding options for transport schemes have been put in place such as the Local Sustainable Transport Fund (LSTF).

7.2.13 Within the paper, the Government considers making a number of specific national commitments to enhance the sustainability of local transport. These include the following:

- Make active travel more attractive;
- Make public transport more attractive; and
- Manage traffic to reduce carbon emissions and tackle congestion, as well as providing additional environmental and public health benefits.

7.2.14 Based on the review of the above White Paper, it is consider that the implementation of the Proposed Scheme is in line with the four key statements and national commitments set out in this document.

**Action for Roads – A Network for the 21st Century**

7.2.15 The Action for Road – A Network for the 21st Century (Ref 7.7) was published by the DfT in July 2013. There are four key headings of importance, and these are as follows:
The Growing Challenge – Referring to the vital importance of the road network and its importance in providing economic benefits. It goes on to underline the importance of making the best use of the network we have, and to plan ahead to help the economy grow;

Transforming Strategic Roads – Where the document refers to the upgrade and maintenance of the strategic road network;

Managing our Roads – Referring to the key conclusions of the Cook Review which provides funding certainty and a reorganisation of the Highways Agency (HA); and

Supporting Local Roads – Referring to the decentralisation of decision making.

7.2.16 Based on the review of the above paper, it is considered that the implementation of the Proposed Scheme is in line with the four headings set out in this document.

Northamptonshire Local Transport Plan

7.2.17 The Local Transport Plan (LTP) for Northamptonshire (Ref 7.8) was published in March 2012 and covers the period up to 2026. This document outlines the overarching strategy for the county that sets out what Northamptonshire County Council’s (NCC) strategic aims and goals are for transportation in Northamptonshire, and replaces the interim LTP that was published in March 2011. The vision set out in the LTP states that:

- The transport system will provide fast and efficient movement of people and goods, and will be accessible for all. Expanding networks and capacity of networks in Northamptonshire will be fully integrated into new developments and regeneration areas to support more sustainable communities;
- Economic growth and prosperity is a top priority for Northamptonshire and connectively has a vital role to play in encouraging business to locate to the area, and getting people to work and services such as education and health, as well as to leisure activities and for shopping. Improved technology and local accessibility will reduce the need to travel, whilst supporting economic growth with a low carbon environment; and
- NCC will work in partnership with all stakeholders and the wider community to deliver this transport vision and strategy.

7.2.18 The accompanying TA outlines how six objectives are discussed in order to achieve the overarching vision of the LTP. Of most relevance to this Chapter is the objective relating to the environment, which is as follows:

- The Environment – ‘To deliver a transport system that minimises and wherever possible reduces the effect of travel on the built, natural and historic environment’.

7.2.19 The accompanying TA also outlines how a number of Strategic Policies are relevant to the Proposed Scheme. The following policies are relevant to this Chapter:

- Strategic Policy 22 – ‘We will reduce the impact that motor vehicles have on the local environment in Northamptonshire by minimising the effects of severance, noise and the emissions from transport’; and
- Strategic Policy 25 – ‘We will avoid or minimise harmful effects on the natural and historic environment when planning and designing new transport infrastructure schemes’.

7.2.20 In line with the policies outlined above, this Chapter specifically discusses effect relating to severance, amongst a number of other environmental effects.

West Northamptonshire Joint Core Strategy 2011

7.2.21 The Pre-Submission Joint Core Strategy (JCS) document for West Northamptonshire (Ref. 7.9) is a Development Plan Document (DPD) which was published in February 2011, and prepared by the Northamptonshire Joint Planning Unit (JPU) on behalf of Daventry District Council (DDC),
Northampton Borough Council (NBC), and South Northamptonshire Council (SNC), working together with NCC.

7.2.22 The JCS set out the long term vision and objectives for the whole of the West Northamptonshire area for the plan period up to 2026, including strategic policies for steering and shaping development. It identifies specific locations for strategic new housing and employment and changes to transport infrastructure and other supporting community facilities, as well as defining areas where development will be limited. It helps to ensure the co-ordination and delivery of other services and related strategies.

7.2.23 The accompanying TA goes in to detail regarding policies which are relevant to the Proposed Scheme. It is not considered necessary or applicable to elaborate on the Policies with regards to this ES Chapter, however to briefly summarise, the policies are primarily concerned with improving strategic connections and enhancing connectivity at the local and neighbourhood level, which the Proposed Scheme helps to support.

Daventry District Council Local Plan

7.2.24 The Daventry District Local Plan (Ref. 7.10) was adopted in June 1997 and covered the period to 2006. A number of policies and proposals contained in the Local Plan were saved by the Government in September 2007. These saved policies will remain until replaced by those in the emerging Local Plan. The TA discusses in greater detail policies relevant to the Proposed Scheme. The Policy relevant to this Chapter is as follows:

Policy GN1 – The granting of planning permission for development will be guided by the need to, amongst other things, safeguard the natural resources of the district, protect and enhance the environment, concentrate development in or closely associated with small and large towns, and make proper use of disused or underutilised land and buildings.

Guidance

7.2.25 The assessment of transport effects has been based on the Institute of Environmental Assessment’s ‘Guidelines for the Environmental Assessment of Road Traffic’ document (Ref. 7.1), which provides general guiding principles in relation to transport topics to consider in EIA.

7.3 Assessment Methodology and Significance Criteria

Scope of the Assessment

7.3.1 An Environmental Scoping Report was submitted to NCC in April 2014. This section provides an update on the scope of the assessment and outlines insignificant and potentially significant effects.

Insignificant Effects

7.3.2 It assumed that all construction is evenly distributed over the two year construction period from 2015-2017 and that there will be a cut and fill balance on Site, therefore resulting in no trips to remove material offsite.

7.3.3 A total of 8,152 HGV trips are forecast over the two year construction period, with each year forecast to generate approximately 4,076 HGV trips. Assuming a 50 week working year, this is equivalent to 82 HGV trips per five-day working week, 16 HGV trips per eight-hour working day or and two HGV trips per hour (on average).
7.3.4 The average number of construction workers to the site is 90 per day which results in 11 trips in the AM Peak hour. It is assumed that construction worker trips will arrive / depart the Site from various directions, hence spreading and decreasing the additional movements across the highway network.

7.3.5 The volume of construction HGV traffic is considered to be insignificant as it equates to an increase in traffic of less than 10%, far below the recommended IEMA 30% threshold. The volume of additional peak trips is also considered to be insignificant, based on similar thresholds. Further detail is provided in Appendix 7.1 and 7.2.

7.3.6 Therefore, no assessment is required during the site preparation, earthworks and construction phase.

7.3.7 Given the nature of the Proposed Scheme it is not envisaged that any significant number of hazardous load movements will be required during any phase of the Proposed Scheme. Therefore, no further assessment with regards to Hazardous and Abnormal Loads is required.

7.3.8 The Proposed Scheme will accord with relevant highway design and safety standards and will be subject to a road safety audit where appropriate prior to and following construction. Therefore, due to the fact that the Proposed Scheme will provide a brand new road appropriately designed to safety standards, there is no requirement to assess accidents and safety during the operational phase.

Potentially Significant Effects

7.3.9 The potentially significant environmental effects relating to traffic and transport are considered by this Chapter, and are the same for the site preparation, earthworks and construction phase and the operational phase of the Proposed Scheme. These include the following:

- Severance;
- Driver stress and delay;
- Pedestrian delay;
- Pedestrian and cyclist amenity; and
- Fear and Intimidation.

7.3.10 It should be noted that in terms of severance, pedestrian delay and pedestrian and cyclist amenity, the focus is the effects of transportation movements on users of the roads themselves as opposed to the effects on the wider recreational resource and public rights of way which is considered in Chapter 17 – Socio-economics.

Extent of the Study Area

7.3.11 In order to provide a robust assessment, traffic flows for all roads located within a 1km buffer of the Proposed Scheme have been obtained and subsequently assessed. Please see Figure 7.1 for details of the Study Area. Appendix 7.1 also lists the names of all the roads/links assessed.

Consultation Undertaken to Date

7.3.12 Table 7.1 provides a summary of the consultation activities undertaken in support of the preparation of this Chapter.

<table>
<thead>
<tr>
<th>Body / Organisation</th>
<th>Individual(s) at Body / Organisation</th>
<th>Meeting Dates and Other Forms of Consultation</th>
<th>Summary of Outcome of Discussions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGWSP Northamptonshire</td>
<td>Lou Mason- Walsh Senior Transport</td>
<td>Meeting 24/02/14 and follow-up email communication to</td>
<td>Discussed traffic flow methodology/study area for analysis</td>
</tr>
</tbody>
</table>
Method of Baseline Data Collation

7.3.13 The analysis has been informed by the following data:

Traffic Data

7.3.14 Traffic Data was obtained from MGWSP Northamptonshire Highways SATURN model in order to conduct traffic flow analysis. Volume, Net Speed and HGV data was obtained for the following scenarios:
- 2009 AM and PM Base scenario;
- 2017 Do Minimum and Do Something scenario; and
- 2032 Do Minimum and Do Something scenario.

7.3.15 It should be noted that the SATURN model used is strategic and was not intended to be used for a detailed purpose. Where appropriate, a number of manual corrections have been undertaken in certain locations to provide more realistic traffic flows.

Committed Developments

7.3.16 The following committed developments are in the area surrounding the Proposed Scheme:
- Upton Lodge - development of housing, known as Upton Lodge (up to 1,780 dwellings), community and education facilities including a new primary school (3.8ha), employment (22,000m² floorspace), park and ride facility (1,000 car spaces) and part of a country park (7.7ha);
- Upton Park - Development for up to 1000 residential units, primary school and local centre up to 2,000m²; and
- Land off High Street, Flore (67 dwellings, public open space and surface water balancing pond).

7.3.17 These committed developments have been built into the SATURN model flows obtained for the ES Study Area and are therefore taken into consideration in this assessment.

Personal Injury Accident (PIA) Data

7.3.18 PIA data covering the latest five year period available was obtained from NCC, covering the agreed study area. The data covered the period between 04/01/09 to 29/12/13. A detailed analysis of PIA data has been undertaken in the TA.

Assessment Modelling

7.3.19 SATURN is the software program which has been used to assess the effects of the Proposed Scheme on the Highway Network.
Assessment Methodology

7.3.20 This section outlines the methodology undertaken to assess the potentially significant effects outlined in section 7.3.3.

Severance

7.3.21 Severance is defined in the DMRB (Ref. 7.2) as: “...the separation of residents/site users from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows.”

7.3.22 Several factors are considered in determining the existing level of severance. These include road width, traffic flow and composition, traffic speeds and the availability of pedestrian crossing facilities.

7.3.23 The DMRB (Ref. 7.2) provides a set of measures for the identification of community severance and offers guidance as to the level of pedestrian diversion that may follow in terms of the two-way Annual Average Daily Traffic (AADT) of a link. Table 7.2 outlines the thresholds of community severance as prescribed by the DMRB.

Table 7.2: Severance Thresholds

<table>
<thead>
<tr>
<th>Severance Level</th>
<th>Two-Way Traffic Flow (AADT)</th>
<th>Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight</td>
<td>&lt;8,000</td>
<td>&lt;250m</td>
</tr>
<tr>
<td>Moderate</td>
<td>8,000-16,000</td>
<td>250-500m</td>
</tr>
<tr>
<td>Significant</td>
<td>&gt;16,000</td>
<td>&gt;500m</td>
</tr>
</tbody>
</table>

Driver Stress and Delay

7.3.24 Driver Stress, as outlined in the DMRB Volume 11, Section 3, Part 9 ‘Vehicle Travellers’ (Ref. 7.11), has three principal elements: frustration, fear of potential accidents and uncertainty relating to the route being followed. It is recognised that the weight of these factors varies depending on the individual driver. For example, those who drive for commuting purposes will often have a higher stress threshold, due to route experience and knowledge, compared to those who may only drive on a route occasionally for leisure purposes.

7.3.25 Driver stress thresholds, as outlined in Tables 7.3 and 7.4, differ for single carriageway and dual carriageway roads.

Table 7.3: Driver Stress for Single Carriageway Roads

<table>
<thead>
<tr>
<th>Average Peak Hourly Flow per Lane (Units)</th>
<th>Average Journey Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>50-70</td>
</tr>
<tr>
<td>50-70</td>
<td>&gt;70</td>
</tr>
<tr>
<td>&lt;600</td>
<td>High*</td>
</tr>
<tr>
<td>600-800</td>
<td>High</td>
</tr>
<tr>
<td>&gt;800</td>
<td>High</td>
</tr>
</tbody>
</table>

*Moderate in urban areas
Table 7.4 Driver Stress for Dual Carriageway Roads

<table>
<thead>
<tr>
<th>Average Peak Hourly Flow per Lane (Units)</th>
<th>Average Journey Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;50</td>
</tr>
<tr>
<td>&lt;1200</td>
<td>High*</td>
</tr>
<tr>
<td>1200-1600</td>
<td>High</td>
</tr>
<tr>
<td>&gt;1600</td>
<td>High</td>
</tr>
</tbody>
</table>

7.3.26 Driver delay has been considered in the TA via junction capacity analysis at all internal junctions of the Proposed Scheme and agreed off-site locations. Junction modelling software calculates the delay to vehicles in seconds.

Pedestrian Delay

7.3.27 Few quantitative methods of assessing pedestrian delay exist. IEMA guidance (Ref. 7.1) suggests a range of pedestrian crossing times of 10 seconds (lower threshold) to 40 seconds (higher threshold) which equate to a link with no crossing facilities and a two-way flow of approximately 1,400 vehicles in the peak periods. However, the guidance also recommends that assessments should be based on judgement rather than specific thresholds to determine whether or not there is significant pedestrian delay. Nonetheless, the thresholds described in the guidance will be used to inform the assessment.

Pedestrian and Cyclist Amenity

7.3.28 Pedestrian and cyclist amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition, footway and cycleway widths and their separation from traffic. This potentially significant effect is considered to be a broad assessment category which also encompasses fear, intimidation and exposure to noise and air pollution. A tentative threshold for judging the significance of changes in pedestrian and cyclist amenity is described as instances where total traffic flow or its Heavy Goods Vehicles (HGV) component halves or doubles.

Fear and Intimidation

7.3.29 There is neither formal guidance nor a consensus on the thresholds for the assessment of the level of fear and intimidation experienced by pedestrians. However, the degree of fear and intimidation experienced is generally dependent on traffic volumes, composition and the presence of protection such as wide footways or guardrails. IEMA guidance (Ref. 7.1) suggests the use of degree of hazard thresholds as set out in Table 7.5 in order to assess fear and intimidation in the first instance.

Table 7.5: Fear and Intimidation Assessment Criteria

<table>
<thead>
<tr>
<th>Degree of hazard</th>
<th>Average traffic flow over 18 hour day (vehicle/hour)</th>
<th>Total 18 hour HGV flow</th>
<th>Average speed over 18 hour day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>1800+</td>
<td>3000+</td>
<td>20+</td>
</tr>
<tr>
<td>Great</td>
<td>1200-1800</td>
<td>2000-3000</td>
<td>15-20</td>
</tr>
<tr>
<td>Moderate</td>
<td>600-1200</td>
<td>1000-2000</td>
<td>10-15</td>
</tr>
</tbody>
</table>
Accidents and Safety

7.3.30 The IEMA guidelines (Ref. 7.1) state that an assessment of road safety on the highway network should be undertaken based on recent collision records.

7.3.31 An assessment of the latest five year period of accident data has been conducted and can be found in greater detail within the TA.

Significance Criteria

7.3.32 The assessment of potential effects as a result of the Proposed Scheme has taken into account both the site preparation, earthworks, construction phase and the operational phase. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Scheme and the sensitivity of the affected receptor/receiving environment to change, as well as a number of other factors that are outlined in more detail in Chapter 2 – Approach to EIA. Magnitude of change and the sensitivity of the affected receptor/receiving environment are both assessed on a scale of high, medium, low and negligible (as shown in Chapter 2 – Approach to EIA).

7.3.33 In each case, the receptor is identified as highway users (i.e. pedestrians, cyclists, motorists etc.). On this basis, and given that the receptor is people, it is considered that the receptor will be sensitive to changes in traffic flow as a result of the Proposed Scheme. The receptor is therefore deemed to be of high sensitivity for the purposes of this assessment.

7.3.34 The significance of changes in traffic flow volume on receptors for each of the environmental effects listed previously has been considered in relation to the significance matrix summarized in Table 7.6.

Table 7.6: Matrix of Significance for the Consideration of Environmental Effects

<table>
<thead>
<tr>
<th>Magnitude of Change</th>
<th>Sensitivity of Receptor / Receiving Environment to Change / Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>Major</td>
</tr>
<tr>
<td>Medium</td>
<td>Moderate to Major</td>
</tr>
<tr>
<td>Low</td>
<td>Minor to Moderate</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

7.3.35 The following terms have been used to define the significance of the effects identified:

- Major effect: where the Proposed Scheme could be expected to have a very significant effect (either positive or negative) on traffic volumes on the surrounding highway network and its users;
- Moderate effect: where the Proposed Scheme could be expected to have a noticeable effect (either positive or negative) on traffic volumes on the surrounding highway network and its users;
- Minor effect: where the Proposed Scheme could be expected to result in a small, barely noticeable effect (either positive or negative) on traffic volumes on the surrounding highway network and its users; and
- Negligible: where no discernible effect is expected as a result of the Proposed Scheme on traffic volumes on the surrounding highway network and its users.
Sensitive Receptors

7.3.36 As discussed, for the purpose of this assessment the sensitive receptor has been identified as Highway Users, constituting of pedestrians, cyclists, motorists etc. As Highway Users are people, it is deemed that the receptor is of high sensitivity and has therefore been classified as such throughout this assessment.

7.4 Baseline Conditions

Introduction

7.4.1 The following section provides a description of the key existing baseline conditions relevant to the study area and additionally PIA analysis.

Key Routes and Local Highway Network

7.4.2 There are a number of key routes surrounding the study area of the Proposed Scheme, as described below.

7.4.3 The M1 forms part of the national strategic road network, and the priority European Trade Route which forms part of the Trans-European Road Network (TERN). It provides good access to the north and midlands, including Birmingham and Manchester via the M6 motorway, and to the south including London. Within the study area of the Proposed Scheme, the M1 motorway links to the A45 at Junction 16, which provides links to other areas of Northamptonshire and beyond.

7.4.4 The A5 is a trunk road and also forms part of the national strategic road network, and the priority European Trade Route which forms part of the TERN. It provides good access to the north and midlands, including Birmingham and Manchester via the M6 motorway, and to south including London via the M1 motorway. Within the study area of the Proposed Scheme, the A5 trunk road links to the A45 at Weedon Bec which connects Northampton and Daventry. The A45 provide links to other areas of Northamptonshire and beyond.

7.4.5 The A45 is a strategic road and runs east-west across Northamptonshire connecting Thrapston in the east to Rugby in the west. It connects in the east at Thrapston with the A14 Trunk Road, which is part of the national strategic road network, and the priority European Trade Route which forms part of the TERN, and provides a link to the eastern coast ports of Felixstowe and Harwich. Within the study area of the Proposed Scheme, the A45 links to the M1 motorway at Junction 16, the A5 at Weedon, and to the M45 motorway to the north-west of Daventry. The M1 motorway and M45 motorway, along with the A5 Trunk Road, provide links to other areas of Northamptonshire and beyond.

7.4.6 Along with the aforementioned key routes, there are also a number of other routes surrounding the study area of the Proposed Scheme. The A4500 Weedon Road is a strategic road which runs east-west from the centre of Northampton, where it links with other key routes in the town, to the M1 motorway at Junction 16, where it also links with the A45.

7.4.7 The remaining links assessed in this Chapter are located in the villages of Weedon Bec, and Flore, and are residential in nature with similar characteristics.

Sustainable Travel

Walking and Cycling Links

7.4.8 Within the study area of the Proposed Scheme there are a number of Public Rights of Way (PRoW), comprising of three footpaths and a bridleway which are proposed to be intersected by the Proposed
Table 7.7 provides further details on the PRoW that will be affected by the Proposed Scheme.

<table>
<thead>
<tr>
<th>Route Code</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU1</td>
<td>Footpath</td>
<td>It starts at the A45 Flore Hill Flore. It then runs in a north west direction and it ends at the parish boundary of Dodford, east of Dodmoor Farm with the junction of route EN9.</td>
</tr>
<tr>
<td>EU7</td>
<td>Footpath</td>
<td>It starts at the A45 High Street, Flore, opposite No.72. It then runs in a north east direction passing under the M1 motorway and it ends at the parish boundary of Upper Heyford, east of the climatological station, with the junction of route KT5.</td>
</tr>
<tr>
<td>EU5</td>
<td>Footpath</td>
<td>It starts at the A45 High Street Flore, at the Petrol Filling Station, opposite the White Hart Pub. It then runs in a north east direction and it ends at Brington Road, north east of Flore, linking with route EU6.</td>
</tr>
<tr>
<td>EU14</td>
<td>Bridleway</td>
<td>It starts at the north end of Hillside Road, Flore, at Hobhill Barn. It then runs north and it ends at the junction with route EU2, south of Broa前往Spinney.</td>
</tr>
</tbody>
</table>

Source: Northamptonshire Highways (March 2014)

7.4.9 Within the local-level study area, there are a large number of other public footpaths. The ones in closest proximity to the Site comprise Footpaths EU6 from the agricultural land to north-east to the M1 motorway at Brington Road; EN8 from unnamed road 3 to the A45; EN9 from the A5 to the River Nene; EU10 and KT4 between Nether Heyford and Flore to the south of the A45, EU12 from Church Street/A5 to Flore village; EU2 from Brooke’s Plantation to Brockhall Road near the M1.

7.4.10 In addition to the PRoW, there are a number of other non-designated public routes within the Site and the immediate area, including the pedestrian footpaths present in and between the villages of Upper Heyford, Flore, Weedon Bec and Dodford along the A45.

7.4.11 The Grand Union Canal, a non-designated public route, runs through the western part of the Site. There are no locks along the section of the Canal within the Site, although there are a number of locks to the north. The route alongside the canal and towpath is rural within the Site, although it is of a more urban nature to the south within the village of Weedon Bec. There are no bridges over the Canal within the Site, but there are a number of historic brick bridges over the Canal to the north and south of the Site. See Figure 7.2 for further details of the location of the PRoWs and non-designated public routes.

7.4.12 Within the study area of the Proposed Scheme there are no cycle routes present. The accompanying TA discusses in more detail the major National Cycle Network routes which run through Northamptonshire and outside the Study Area.

**Bus Services**

7.4.13 Within the study area of the Proposed Scheme both Northampton and Daventry are comparatively well served by bus services with a wide range of services being provided by the operator Stagecoach, with most bus and coach services running from Northampton and Daventry bus stations.

7.4.14 There are three bus services that operate between Northampton and Daventry along the A45 corridor, within the study area and these are Stagecoach Services D1, D2 and D3. These services can be accessed via numerous bus stops along the A45 corridor between Northampton and Daventry.

7.4.15 Table 7.8 provides a summary of the frequency of these bus services which operate along the A45 corridor between Northampton and Daventry.
### Table 7.8: Bus Services Operating Along the A45 Corridor between Northampton and Daventry

<table>
<thead>
<tr>
<th>Service Number</th>
<th>Description</th>
<th>Monday to Friday</th>
<th>Operating Frequency /Buses Per Day</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Daventry, Grange Estate – Northampton, Railway Station</td>
<td>10</td>
<td>3</td>
<td>13</td>
<td>No Service</td>
</tr>
<tr>
<td></td>
<td>Northampton Railway Station – Daventry, Grange Estate</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>No Service</td>
</tr>
<tr>
<td>D2</td>
<td>Daventry, Lang Farm – Northampton, Railway Station</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Northampton Railway Station – Daventry, Lang Farm</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>D3</td>
<td>Daventry, Grange Estate and Land Farm – Northampton, Railway Station</td>
<td>9</td>
<td>4</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Northampton Railway Station – Daventry, Grange Estat and Lang Farm</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Traveline (March 2014)

7.4.16 Appendix C of the TA provides further details regarding bus timetables and route maps for the D1, D2 and D3 bus services.

### PIA Analysis

7.4.17 The TA has undertaken a detailed analysis of PIA data for the latest five year period available (between 04/01/09 to 29/12/13) over the agreed Study Area.

7.4.18 Of most relevance to this Chapter are the accidents which occurred on the A45, the road to be directly affected by the Proposed Scheme.

7.4.19 In total, approximately 65 accidents were recorded along the A45 between Northampton and Daventry within the study area of the Proposed Scheme. The majority of these accidents were either serious or slight in severity, with two fatal accidents being recorded along the A45 between Northampton and Daventry within the study area, with 18 out of the 65 accidents being recorded at junctions along the A45 corridor between Northampton and Daventry.

7.4.20 Cluster analysis was also undertaken using GIS software, which identifies any patterns in accidents derived from the data provided by NCC. Table 7.9 below outlines the clusters identified along the A45.

### Table 7.9: PIA Cluster Locations along A45 between Upper Heyford and the M1 Motorway

<table>
<thead>
<tr>
<th>Site</th>
<th>Description</th>
<th>Fatal Accidents&lt;sup&gt;†&lt;/sup&gt;</th>
<th>Serious Accidents&lt;sup&gt;†&lt;/sup&gt;</th>
<th>Slight Accidents&lt;sup&gt;†&lt;/sup&gt;</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Junction of the A425 Southern Way/ A45 London Road/ A45 Stefien Way / B4038 London Road</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Junction of A45 London Road (east) / B4037 Weedon Road / A45 London Road (west)</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Junction of the A45 London Road / Everdon Road</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
### Future Baseline

7.4.21 The future baseline position for the study area has, as previously outlined, been determined using the traffic data obtained from MGWSP Northamptonshire Highways SATURN model. This data has then been converted into 18 hour Annual Average Weekday Traffic (AAWT) and 24 hour Annual Average Daily Traffic (AADT) traffic flows and is summarised in Appendix 7.1. This Appendix also provides details of the assessment of the future baseline scenarios with respect to:

- Severance;
- Driver Stress and Delay;
- Pedestrian Delay;
- Pedestrian and Cyclist Amenity; and
- Fear and Intimidation.

7.4.22 The future baseline is for informative purposes only and will be used to assess the environmental effects of the Proposed Scheme in the 2017 Do Something Scenario when compared with the 2017 Do Minimum Scenario. It is to be noted that the Proposed Scheme will not generate new trips, rather existing trips on the network will be re-distributed to utilise the new link road appropriately. This re-distribution of traffic represents the difference between the 2017 Do Minimum and 2017 Do Something Scenarios.

### Assessment of Effects, Mitigation and Residual Effects

#### Operational Phase

**Introduction**

7.5.1 This section assesses the likely environmental effects of transport related to the operational phase of the Proposed Scheme. This assessment is based upon a comparison of traffic conditions in the 2017 Do Minimum and the 2017 Do Something scenarios.

7.5.2 The broad ‘rules-of-thumb’, taken from the IEMA’s Guidelines (Ref 7.1) set out earlier in this Chapter, have been used in the assessment of the road links upon which traffic flows are forecast to change by 30% or more. This assessment compares two-way link flows in the AM peak hour, PM peak hour, 18 hour AAWT and 24 hour AADT flows from the 2017 Do Minimum and 2017 Do Something scenarios and is used to inform analysis.

7.5.3 This analysis is included in Appendix 7.1. A total of 38 links have been identified as meeting the IEMA criteria discussed above, and therefore have been assessed below. Please see Appendix 7.1 for description and location of the 38 links.
Design Solutions and Assumptions

7.5.4 The Proposed Scheme will be designed to ensure that internal roundabouts are designed to successfully accommodate capacity and future traffic flows in the area. Further detail is provided within the TA relating to the Capacity Assessments undertaken for the Proposed Scheme.

7.5.5 The TA also discusses the design measures for the PRoWs which intersect the Proposed Scheme. Table 7.10 provides a summary of the design solutions.

Table 7.10: Public Rights of Way Design Solutions

<table>
<thead>
<tr>
<th>Route Code</th>
<th>Type</th>
<th>Design Solution Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU1</td>
<td>Footpath</td>
<td>A new underpass will be provided under the single carriageway with the footway surface improved in the location of the underpass.</td>
</tr>
<tr>
<td>EU7</td>
<td>Footpath</td>
<td>A new underpass will be provided under the single carriageway with the footway surface improved in the location of the underpass</td>
</tr>
<tr>
<td>EU5</td>
<td>Footpath</td>
<td>A new road bridge will be provided over the single carriageway. Linking with route EU6.</td>
</tr>
<tr>
<td>EU14</td>
<td>Bridleway</td>
<td>A new overpass will be provided over the single carriageway suitable for all non-motorised modes of transport, with the bridleway surface improved in the location of the overpass.</td>
</tr>
</tbody>
</table>

Severance

7.5.6 As detailed previously, several factors are considered in determining the level of severance, including road width, traffic flow and composition, traffic speeds and the availability of pedestrian crossing facilities.

7.5.7 The DMRB (Ref 7.2) provides a set of measures for the identification of community severance and offers guidance as to the level of pedestrian diversion that may follow in terms of the two-way AADT of a link, with Table 7.2 outlining the thresholds of community severance prescribed.

7.5.8 An analysis of the change in levels of severance between the 2017 Do Minimum and 2017 Do Something scenarios is included at Appendix 7.1.

7.5.9 Over the whole network of assessed links, the severance results show improvement (from severe to slight and moderate) or no change in severance classification as a result of the Proposed Scheme. In many cases, although the degree of severance has not changed classification, traffic flow volume is projected to decrease in the 2017 Do Something scenario. Of notable mention is links 1d to 1m, which is the section of the A45 from where most traffic would be diverted as a result of the Proposed Scheme and where classification has changed from significant to slight. Here traffic flow volumes decrease significantly in the 2017 Do Something scenario, illustrating the benefits which the Proposed Scheme would bring in terms of severance. Although no negative changes in severance classification occurs, traffic flow does increase on certain links and on areas of the network. Therefore the magnitude of change is considered to be low.

7.5.10 The sensitivity of the receptor (Highways User-pedestrian, cyclist and motorists) is high and the magnitude of change, prior to mitigation, is low. Therefore, there is likely to be a direct, permanent, long-term effect on Highway Users of minor to moderate positive significance prior to the implementation of mitigation measures.
Mitigation

7.5.11 No mitigation is required.

Residual

7.5.12 The sensitivity of the receptor (Highways User-pedestrians, cyclists, motorists) is high and the magnitude of change, following mitigation, remains low. Therefore, there is likely to be a direct, permanent, long-term residual effect on Highway Users of minor to moderate positive significance.

Driver Stress

7.5.13 As summarised for single and dual carriageway roads in Tables 7.3 and 7.4, the DMRB (Ref 7.2) outlines the thresholds of traffic flow and average journey speeds at which driver stress is perceived to change. The DMRB (Ref 7.2) sets out traffic flows in units and accordingly, for the purposes of determining baseline conditions, a light vehicle is defined as one unit and HGVs as three units.

7.5.14 An analysis of the change in levels of driver stress between the 2017 Do Minimum and 2017 Do Something scenarios is included at Appendix 7.1.

7.5.15 The evaluation of driver stress has been considered using the methodology described in the DMRB (Ref 7.2), with calculated two-way link flows used as a basis for the calculations of flow per lane. To provide a robust analysis, traffic data from both the AM and PM peak hour periods have been used to inform the analysis.

7.5.16 The results show that in all but one case (link 1p); the degree of driver stress is set to improve or remain the same in the 2017 Do Something scenario. 1p is the A4500 Weedon Road and changes from low to moderate in the Do Something scenario. It is to be noted that although there is a change in severity class, the increase in traffic flow on the link is arguably small for a dual carriageway road. Additionally, the numbers for the 2017 Do Something scenario are on the low end of the moderate scale (which is 1200), with a projected 1282 flow units in the AM peak and 1262 flow units in the PM peak.

7.5.17 Many of the links have high degrees of driver stress, however in the 2017 Do Something scenario, 11 links (1d to 1n) improve to either low or moderate in terms of driver stress. These links (which are the sections of the A45 from which traffic will be diverted onto the Proposed Scheme) also see significant decreases in traffic volume as a result of the Proposed Scheme. Although traffic flow volume is set to increase on certain links in the 2017 Do Something scenario, the impact is arguably negligible given that the degree of stress classification remains the same.

7.5.18 The sensitivity of the receptor (Highways User- pedestrians, cyclists and motorists) is high and the magnitude of change for the network as a whole, prior to mitigation, is medium. Therefore, there is likely to be a direct, permanent, long-term effect on Highway Users of moderate positive significance prior to the implementation of mitigation measures.

Mitigation

7.5.19 No mitigation is required.

Residual

7.5.20 The sensitivity of the receptor (Highways User- pedestrians, cyclists and motorists) is high and the magnitude of change for the network as a whole, following mitigation, remains medium. Therefore, there is likely to be a direct, permanent, long-term residual effect on Highway Users of moderate positive significance.
Driver Delay

7.5.21 Driver delay, which is also considered to contribute to the level of driver stress, is reported in the TA as part of the junction capacity analysis across the agreed junction study area.

7.5.22 Relevant to this Chapter are the capacity assessments which have been undertaken for seven junctions which surround the Proposed Scheme. The junctions are as follows:

- Junction 1- Junction of the A425 Southern Way / A45 London Road / A45 Stefen Way / B4038 London Road;
- Junction 2- Junction of the A45 London Road (East) / B4037 Weedon Road / A45 London Road (West);
- Junction 5- Junction of Brington Road / A45 High Street (East) / Kings Lane / A45 High Street (West);
- Junction 6- Junction of A45 Main Road (East) / Middle Street / A45 Main Road (West);
- Junction 12- Junction of the A361 Badby Road West (North) / B4037 Badby Road / A361 Badby Road West (South);
- Junction 13- Junction of Sandy Lane / A4500 Weedon Road (East) / High Street / A4500 Weedon Road (West); and
- Junction 14- Junction of Tollgate Way / A4500 Weedon Road (East) / A5076 Upton Way / A4500 Weedon Road (West).

7.5.23 Tables 7.11 and 7.12 below illustrates the difference in Driver Delay (calculated in seconds) between the 2017 Do Minimum and Do Something Scenarios.

| Junction | Do Minimum | | | Do Something | | |
|----------|------------|---|---|-------------|---|
|          | 2009 | 2017 | 2032 | 2017 | 2032 |
| 1        | 3.16 | 0.94 | 4.59 | 5.12 | 4.22 |
| 2        | 4.99 | 17.86 | 27.37 | 68.69 | 203.29 |
| 5        | 26.45 | 28.93 | 31.06 | 9.24 | 9.42 |
| 6        | 13.24 | 18.02 | 11.86 | 5.96 | 6.29 |
| 12       | 6.88 | 7.17 | 7.64 | 7.23 | 31.01 |
| 13       | 9.85 | 67.31 | 5.03 | 311.96 | 6.70 |
| 14       | 5.91 | 38.99 | 65.50 | 21.78 | 156.57 |
Table 7.12: PM Peak Maximum Delays (seconds) for junctions surrounding Proposed Scheme

<table>
<thead>
<tr>
<th>Junction</th>
<th>Do Minimum</th>
<th>2009</th>
<th>2017</th>
<th>2032</th>
<th>Do Something</th>
<th>2017</th>
<th>2032</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.36</td>
<td>0.99</td>
<td>4.72</td>
<td>4.59</td>
<td>6.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4.60</td>
<td>16.96</td>
<td>21.42</td>
<td>28.83</td>
<td>105.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>26.05</td>
<td>33.80</td>
<td>54.84</td>
<td>8.69</td>
<td>9.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>8.63</td>
<td>11.76</td>
<td>14.72</td>
<td>6.05</td>
<td>6.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>6.84</td>
<td>7.09</td>
<td>7.34</td>
<td>7.24</td>
<td>7.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>9.94</td>
<td>29.13</td>
<td>5.32</td>
<td>50.31</td>
<td>6.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>6.58</td>
<td>7.12</td>
<td>47.11</td>
<td>51.24</td>
<td>32.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.5.24 **Table 7.12** and **7.13** demonstrate that on Junctions 5, 6 and 14 there is a reduction in driver delay when comparing the 2017 Do Something and Do Minimum Scenarios, which is considered to be positive both in terms of driver delay and driver stress. For the rest of the junctions (1, 2, 12 and 14), there is an increase in delay and driver stress. When considering the Proposed Scheme as a whole, the number of increases marginally outweighs the decreases and therefore the overall effect is considered to be negative.

7.5.25 The sensitivity of the receptor (Highways User - pedestrians, cyclists and motorists) is high and the magnitude of change for the network as a whole, prior to mitigation, is low. Therefore, there is likely to be a direct, permanent, long-term effect on Highway Users of **minor negative** significance prior to the implementation of mitigation measures.

**Mitigation**

7.5.26 No mitigation is required.

**Residual**

7.5.27 The sensitivity of the receptor (Highways User - pedestrians, cyclists, motorists) is high and the magnitude of change, following mitigation, remains low. Therefore, there is likely to be a direct, permanent, long-term residual effect on Highway Users of **minor negative** significance.

**Pedestrian Delay**

7.5.28 DMRB guidance (**Ref 7.2**) recommends that assessments should be based on judgement rather than specific thresholds to determine whether or not there is significant pedestrian delay.

7.5.29 Nonetheless, the thresholds described in the IEMA guidance (**Ref 7.1**) set out in **Section 7.3** will be used as a starting point for this assessment, and an analysis of the change in levels of pedestrian delay between the 2017 Do Minimum and Do Something scenarios is included at **Appendix 7.1**.
7.5.30 Of the 38 links assessed for pedestrian delay, it can be seen that the majority (32) are not forecast to increase to above the 1400 vehicle per hour peak threshold in the 2017 Do Something scenario. On a number of links, traffic flows are set to decrease in numbers (particularly on the section of the A45 from which traffic is to be diverted), demonstrating the benefits of the Proposed Scheme on the network as a whole in terms of pedestrian delay.

7.5.31 Six links are forecast to operate above the 1400 threshold, in both the 2017 Do Minimum and Do Something scenarios. Three of these links (1n to 1p) are on the approach or at the M1 motorway Junction 16; therefore it is considered that no pedestrians would be using this section of the Local Highway Network. Links 1a, 1b and 1c are in relatively rural locations, again suggesting that there would be very little pedestrian usage on this section of the Local Highway Network.

7.5.32 It is considered that on the above basis that the Proposed Scheme has demonstrable benefits in terms of pedestrian delay. Therefore, the magnitude of change is considered to be low.

7.5.33 The sensitivity of the receptor (Highway Users- pedestrians, cyclists and motorists) is high and the magnitude of change, prior to mitigation, is low. Therefore, there is likely to be a direct, permanent long-term effect on Highway Users of minor to moderate positive significance prior to the implementation of mitigation measures.

Mitigation

7.5.34 No mitigation is required.

Residual

7.5.35 The sensitivity of the receptor (Highway Users-pedestrians, cyclists and motorists) is high and the magnitude of change, following mitigation, remains low. Therefore, there is likely to be a direct, permanent long-term residual effect on Highway Users of minor to moderate positive significance.

Pedestrian and Cyclist Amenity

7.5.36 An analysis of pedestrian amenity between the 2017 Do Minimum and 2017 Do Something scenarios is included at Appendix 7.1.

7.5.37 As discussed in the Section 7.3, a tentative threshold for judging the significance in changes in pedestrian and cyclist amenity is described in IEMA guidelines (Ref 7.1) as instances where total traffic flow or its HGV component halves or doubles.

7.5.38 Of the total 38 links assessed 18 links show a change in traffic flows in excess of half or double, with 14 of these showing more than a 50% decrease in traffic flows and four showing more than a 50% increase in traffic flows.

7.5.39 The 14 links which display traffic which decreases by more than 50% following the implementation of the scheme demonstrate positive effects of the scheme.

7.5.40 The four links which display traffic flows which increase by more than 50% following the implementation of the scheme demonstrate negative effects of the scheme.

7.5.41 The most significant change in traffic flow is on link number 25 (a section of Bridge Street) which displays an increase in traffic flow of 165%. It is considered that this link contributes to a minor negative change. However taking the whole assessed network into consideration, the scheme is likely to result in benefits to the local highway network in terms of pedestrian and cyclist amenity.

7.5.42 The sensitivity of the receptor (Highway Users- pedestrians, cyclists and motorists) is high and the magnitude of change, prior to mitigation, is low. Therefore, there is likely to be a direct, permanent,
long-term effect on Highway Users of **minor to moderate positive** significance prior to the implementation of mitigation measures.

**Mitigation**

7.5.43 No mitigation is required.

**Residual**

7.5.44 The sensitivity of the receptor (Highway Users—pedestrians, cyclists and motorists) is high and the magnitude of change, following mitigation, remains low. Therefore, there is likely to be a direct, permanent, long-term residual effect on Highway Users of **minor to moderate positive** significance.

**Fear and Intimidation**

7.5.45 An analysis of the change in levels of fear and intimidation between the 2017 Do Minimum and Do Something scenarios is included at **Appendix 7.1**.

7.5.46 With the exception of two links, (1b and 4c) all of the assessed links (38) are forecast to experience speeds greater than 20mph over an 18 hour day in the 2017 Do Something scenario, hence the degree of hazard being deemed to be Extreme. Of these 36 links, 32 scored Extreme in the 2017 Do Minimum scenario as well, demonstrating no change in severity classification in the majority of cases. The four remaining links (1e, 1h, 1i and 1j) which scored Extreme have changed classification as a result of the Proposed Scheme. Link 1b improves classification from Extreme to Great and Link 4c from Moderate to Low. Therefore, when trying to elicit general patterns as a result of the Proposed Scheme over the whole network, due to the fact that in the majority of cases there are no changes in severity classification, the Proposed Scheme will likely have a negligible effect in terms of speed.

7.5.47 When looking at the average traffic flow of the fear and intimidation assessment, 25 links experience no change in severity classification as a result of the Proposed Scheme. 21 of these links (please refer to **Appendix 7.1**) are classified as Low, one as Moderate and three as Great.

7.5.48 Only three links (1c, 1p and 7) out of the 38 links assessed are forecast to upgrade in severity classification in the 2017 Do Something scenario. Links 1c and 1p change from Moderate to Great and Link 7 from Low to Moderate.

7.5.49 The 10 remaining links (1d-1m of the A45) improve in the 2017 Do Something scenario from Moderate to Low. This demonstrates the benefits of the Proposed Scheme in terms of fear and intimidation.

7.5.50 The total 18 hour HGV flows show similar results; 28 links show no change in severity classification in the 2017 Do Something scenario, 22 are classified as Low and six as Moderate. The remaining 12 links (1d-1m) improve in classification from Moderate to Low, further demonstrating the associated benefits of the Proposed Scheme. Therefore, the overall magnitude of change is considered to be negligible to low

7.5.51 The sensitivity of the receptor (Highway Users—pedestrians, cyclists and motorists) is high and the magnitude of change, prior to mitigation, is negligible to low. Therefore, there is likely to be a direct, permanent, long-term effect on Highway Users of **negligible to minor positive** significance prior to the implementation of mitigation measures.

**Mitigation**

7.5.52 No mitigation is required.
Residual

7.5.53 The sensitivity of the receptor (Highway Users- pedestrians, cyclists and motorists) is high and the magnitude of change, following mitigation, is negligible to low. Therefore, there is likely to be a direct, permanent long-term residual effect on Highway Users of negligible to minor positive significance.

7.6 Limitations and Assumptions

7.6.1 The data used in this assessment is from a strategic model and therefore the results should be treated with caution, as it was not intended to be used for this detailed purpose. Where appropriate, a number of manual corrections have been undertaken in certain locations to provide more realistic traffic flows.

7.6.2 The common limitations include uncertainty in the validity of baseline data, the effect of the passage of time on the validity of data, future changes that could affect conclusions, and assumptions and predictions.

7.7 Summary

7.7.1 This Chapter has considered the potentially significant effects relating to transportation and traffic associated with the Proposed Scheme both during the site preparation, earthworks and construction phase and the operational phase.

7.7.2 The 2017 Do Minimum and Do Something scenarios have been used as the basis to compare and contrast the environmental effects of the Proposed Scheme in relation to the following effects:

- Severance;
- Driver Stress and Delay;
- Pedestrian Delay;
- Pedestrian and Cyclist Amenity; and
- Fear and Intimidation

7.7.3 Subsequent analysis has demonstrated that limited traffic is projected to be added during the site preparation, earthworks and construction phase, therefore the effect to Highways users will be barely noticeable.

7.7.4 In the operational phase of the Proposed Scheme, it has been demonstrated that there are clear benefits due to a reduction in traffic on the A45 and that the Proposed Scheme will have an overall positive effect within the study area, regardless of the increases in driver delay and stress on four junctions.

7.7.5 Due to the clear and demonstrable benefits of the Proposed Scheme in traffic reduction terms, it is considered that additional mitigation measures are not needed.
### Table 7.13: Summary of Effects Table for Traffic and Transportation

<table>
<thead>
<tr>
<th>Description of Significant Effects</th>
<th>Receptor</th>
<th>Significance of Effects</th>
<th>Significance of Mitigation/Enhancement Measures</th>
<th>Significance of Effects</th>
<th>Relevant Policy</th>
<th>Relevant Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Major, Moderate, Minor, Negligible</td>
<td>Positive / Negative</td>
<td>P/T</td>
<td>D/I</td>
<td>ST/MT/LT</td>
</tr>
<tr>
<td><strong>Operational Phase</strong></td>
<td></td>
<td></td>
<td>None Required.</td>
<td>Minor to Moderate</td>
<td>Positive</td>
<td>P</td>
</tr>
<tr>
<td>Severance</td>
<td>Highway Users</td>
<td>Minor to Moderate</td>
<td>Positive</td>
<td>P</td>
<td>D</td>
<td>LT</td>
</tr>
<tr>
<td>Driver Stress</td>
<td>Highway Users</td>
<td>Moderate</td>
<td>Positive</td>
<td>P</td>
<td>D</td>
<td>LT</td>
</tr>
<tr>
<td>Driver Delay</td>
<td>Highway Users</td>
<td>Minor</td>
<td>Negative</td>
<td>N</td>
<td>D</td>
<td>LT</td>
</tr>
<tr>
<td>Pedestrian Delay</td>
<td>Highway Users</td>
<td>Minor to Moderate</td>
<td>Positive</td>
<td>P</td>
<td>D</td>
<td>LT</td>
</tr>
<tr>
<td>Pedestrian and Cyclist Amenity</td>
<td>Highway Users</td>
<td>Minor to Moderate</td>
<td>Positive</td>
<td>P</td>
<td>D</td>
<td>LT</td>
</tr>
<tr>
<td>Fear and Intimidition</td>
<td>Highway Users</td>
<td>Negligible to Minor</td>
<td>Positive</td>
<td>P</td>
<td>D</td>
<td>LT</td>
</tr>
</tbody>
</table>

**Key to table:**

- P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short-Term, Medium-Term or Long-Term
- N/A = Not Applicable
7.8 References

Ref 7.1 Institute of Environmental Management and Assessment, (2003). Guidelines for the Environmental Assessment of Road Traffic’ (Guidance Note No. 1). IEMA.

Ref 7.2 Department for Transport (dates vary by volume) Design Manual for Roads and Bridges


Ref 7.6 Department for Transport (2011). Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen. DfT

Ref 7.7 Department for Transport (2013). The Action for Road – A Network for the 21st Century. DfT

Ref 7.8 Northamptonshire County Council (2012). Northamptonshire Transport Plan

Ref 7.9 Northamptonshire Joint Planning Unit (2011). West Northamptonshire Joint Core Strategy

Ref 7.10 Daventry District Council (1997). Daventry District Council Local Plan

Ref 7.11 Department for Transport (1993) DMRB Volume 11, Section 3, Part 9 ‘Vehicle Travellers’