

12. TRANSPORTATION

12.1 INTRODUCTION

- 12.1.1 This chapter of the Environmental Statement (ES) assesses the likely significant environmental effects created by the changing transport conditions introduced by the Proposed Development. It incorporates the findings of the Transport Assessment (TA), which is provided at Appendix 12.1 of this ES.
- 12.1.2 The Northampton Gateway Strategic Rail Freight Interchange (SRFI), the 'Proposed Development' is described in Chapter 2 of this ES and reference should be made to that chapter for the description of the development that has been assessed.
- 12.1.3 The Proposed Development would increase the number and alter the pattern of traffic movements on the highway network and would also alter the conditions for other highway users. Hence the effects of the changes on non-motorised users (NMUs) (pedestrians, cyclists, equestrians) as well as drivers are assessed. This chapter of the ES does not present the rail freight strategy, which is considered in separate reports¹.
- 12.1.4 The assessment process and methodology are described in the TA and its supporting documents, which include the Framework Travel Plan (FTP) for the development. Where relevant, summaries only are included in this ES chapter and, in general, reference should be made to the TA and its supporting documents for detail.
- 12.1.5 This chapter describes the assessment methodology, the transport planning policy context, the baseline conditions currently existing at the Proposed Development site and its surroundings, the proposed design measures required to prevent, reduce or offset any significant adverse effects, and the likely residual effects after these measures have been employed.
- 12.1.6 The appended TA examines the generation, distribution and assignment of trips associated with the Proposed Development and the effects of the external trips (beyond the site boundary) on the surrounding transport network. The TA and FTP examine the accessibility of the site by public transport, cycling and walking, and identify the likely modal split of person trips associated with the development. The impact of the development trips on the surrounding transport infrastructure is addressed and it is demonstrated that the identified 'highway mitigation strategy', in combination with the FTP, would appropriately address the increased travel demand and that residual impacts of the Proposed Development are reduced to acceptable levels. However, as referred to later in this Chapter, no assumed reduction in car travel is included in the analysis to ensure a robust and worst-case assessment of likely effects.
- 12.1.7 The Proposed Development would provide public transport, pedestrian and cycle provision for non-car based modes of transport.

¹ For the Rail Operation Report see DCO document 6.7 and for the Rail Capacity Report see DCO document 6.8 – rail policy context in general is set out in the Planning Statement (document 6.6).

12.2 ASSESSMENT METHODOLOGY

General approach

- 12.2.1 This chapter of the ES describes the findings of the TA and its supporting documents, including the FTP, which have been undertaken to support the application for a Development Consent Order (DCO) for the Proposed Development. It examines the relationship between the Proposed Development and the transport network, the effect of the development on that network, and the need to provide improvements to infrastructure to accommodate the proposed uses in a sustainable manner.
- 12.2.2 The assessment has been undertaken using a Department for Transport (DfT) WebTAG compliant transport model and applying a methodology that accords with best practice guidance. It includes an assessment of both the local highway network and the Strategic Road Network (SRN) serving the Proposed Development, the latter in accordance with DfT 'Circular 02/2013 The Strategic Road Network and the Delivery of Sustainable Development'.
- 12.2.3 In addition, this ES Chapter examines the environmental impact of the changing transport conditions resulting from the proposed transport infrastructure and highway mitigation works. This is based on guidance contained within the DfT 'Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3, Parts 8 and 9'.
- 12.2.4 For the purposes of assessment, four categories of impact scale have been used, comprising; **negligible; minor; moderate** and **major**. The definition of the significance of the impact is described in Table 12.1.

Table 12.1 Definition of significance of impact

Scale of impact	Definition
Negligible	An effect that is considered not to be significant or to have no influence. This is applicable where there is a neutral impact which is neither positive nor negative.
Minor	An effect that may be a local issue.
Moderate	An effect that will be important at local level and potentially upwards.
Major	An effect that will be important at borough, county, or regional level.

- 12.2.5 Where impacts are recorded as being minor, moderate or major, and cause an increase in existing congestion, journey times or exacerbate existing safety problems, then the individual impact is described as an adverse one. Where they relieve, then the impact is termed beneficial. Negligible impacts cannot be perceived and hence are neither adverse nor beneficial.
- 12.2.6 In addition to the significance of the impact, the assessment also considers whether the environmental impacts are permanent or temporary.
- 12.2.7 To assess the environmental impact of the Proposed Development and its traffic, the initial stages are to determine the baseline and future year traffic volumes and characteristics, determine the time periods for assessment, and to identify the geographical boundaries of assessment. Once this information is established, the predicted impacts are assessed, along with measures to mitigate any adverse impact.

Scoping Criteria

- 12.2.8 Northamptonshire County Council (NCC) is the local highway authority responsible for the transportation issues within Northamptonshire. Highways England has responsibility for the SRN which, adjacent to the Proposed Development site, comprises the M1 motorway, M1 Junctions 15 and 15A, the A45, A43 and A5.

- 12.2.9 The scale of development requires a transport strategy that seeks to manage travel demand from the outset, whilst providing appropriate access to serve the development and addressing the impact of the development trips on the existing local highway and SRN.
- 12.2.10 In accordance with the PINS Scoping Opinion report (ref TR050006), the assessment of the transport impact of the development is based on a comprehensive transport modelling exercise, for which a Transport Working Group was established to oversee the process. The Transport Working Group comprises representatives from the two highway authorities described above and Highways England's term consultant Aecom, along with specialist transport consultants acting for Roxhill (Junction 15) Ltd. It has met on an approximately monthly basis since July 2016.
- 12.2.11 Buckinghamshire County Council and South Northamptonshire Council requested in the Scoping Opinion that they join the Transport Working Group. These requests were followed up with each Council. This included meeting with Buckinghamshire County Council on the 13th of March 2017 to discuss the Proposed Development, its likely impacts within Buckinghamshire, and their involvement in the Transport Working Group. Following that meeting, having gained a fuller understanding of the role of the Transport Working Group, Buckinghamshire County Council confirmed that their representation on the group was not necessary. It was agreed separately with South Northamptonshire Council that they were appropriately represented on the Transport Working Group via the attendance of the NCC highway officer representing South Northamptonshire Development Control.
- 12.2.12 To confirm that the proposed highway mitigation strategy is appropriate in scale and function, strategic assessment of the Proposed Development and highway mitigation has been undertaken using the Northamptonshire Strategic Transport Model (NSTM2). Further detailed analysis of study area junctions has then been undertaken using micro-simulation and industry standard assessment tools, supported by a Walking, Cycling & Horse-Riding Assessment Review and Stage 1 Road Safety Audit.
- 12.2.13 Separate comprehensive strategies have been developed to address access to the SRFI by public transport, walking and cycling.
- 12.2.14 NCC and Highways England agreed the TA methodology, scope and modelling inputs via a series of transport related documents and Technical Notes. The TA therefore brings together the findings of these various studies and presents the results obtained. The key transport related documents and Technical Notes are appended to the TA at Appendices 1 to 34, as listed at Table 12.2 below. The TA includes a further 28 appendices (Appendices 35 to 62), that provide supplementary baseline data, assessment flows and modelling detail. In general, therefore, this chapter provides only an overview of the findings and reference should be made to the TA and appendices for further detail.

Table 12.2: Key transport documents and Technical Notes appended to the TA

Document name	Ref	TA Appendix
Framework Travel Plan	FTP	1
Public Transport Strategy	PTS	2
Personal Injury Accident Assessment Technical Note	TNA	3
TN1: Transport Modelling Methodology	TN1	4
TN2: Trip Generation	TN2	5
TN2 Addendum: Opening Year Trip Generation	TN2A	6
TN3: HGV Trip Distribution	TN3	7
Light Vehicle Trip Distribution	WSPTN1	8
TN4: Scope of Highway Design Work	TN4	9
TN5: M1 Junction 15	TN5	10
TN6: M1 Junction 15A	TN6	11
TN7: A45 Queen Eleanor Gyratory and Wootton Interchange	TN7	12
TN8: A508 Corridor	TN8	13
TN9: Layby Capacity	TN9	14
TN10: Impacts north of the M1 including the A45 corridor	TN10	15
TN10 Addendum	TN10A	16
TN11: Impacts at junctions along the A5076 corridor	TN11	17
Walking, Cycling & Horse-Riding Assessment Review: Assessment Report	WCHAR1	18
Walking, Cycling & Horse-Riding Review: Review Report	WCHAR2	19
Road Bypass Options Report	RBOR	20
M1 Junction 15: Summary of Highway Options Report	M1J15OR	21
NSTM2: M1J15 Northampton Gateway SRFI Local Model Validation Report	LMVR1	22
NSTM2: Reference Case Forecast Report	TMR1	23
NSTM2: Development Case Forecast Report	TMR2	24
M1 J15 & J15A VISSIM Model - Local Model Validation Report	LMVR2	25
VISSIM Modelling Summary	VISSIM1	26
VISSIM Modelling Summary – Proposed site access	VISSIM2	27
Geometric Design Strategy Record – M1 J15 & A45 improvement, M1 J15A Improvement	GDSR1	28
Geometric Design Strategy Record – A508 Route Upgrade	GDSR2	29
Stage 1 Road Safety Audit	RSA1	30
Stage 1 Road Safety Audit Response Report	RSA1 RR	31
NSTM2: Environmental Statement Data Processing	WSPTN2	32
Construction traffic assumptions and calculations	ADC	33
Road to Rail Freight modal shift calculations	ADC	34

12.3 PLANNING POLICY CONTEXT

General

- 12.3.1 This section considers relevant national and local policies together with guidance on transport and land use.

Committed development and infrastructure schemes

- 12.3.2 The main site is not subject to any extant planning consents of significance in terms of traffic generation. On this basis, no account of any existing land uses at the main site has been taken.
- 12.3.3 There are a significant number of development schemes with planning consent in the vicinity of the site, whose traffic effects need to be taken into account. In addition, committed or planned highway infrastructure, and other major development sites that are currently the subject of planning applications but are not yet committed, have been included where agreed with the Transport Working Group. These schemes, together with relevant and potential Local Plan allocations have been incorporated into the NSTM2 modelling, as explained in the Reference Case Forecast Report (TA Appendix 23).
- 12.3.4 The committed schemes include the Hardingstone SUE and Daventry International Rail Freight Terminal (DIRFT 3), as requested by Northampton Borough Council in their Scoping Opinion response. The inclusion of the proposed development at Mere Lane (reference 15/01531/OUT), the third site noted by Northampton Borough Council, was discussed with the Transport Working Group. It was agreed that this would be accounted for via TEMRPO traffic growth, as it was too remote from the Proposed Development site to require site specific modelling.

Relevant Transport Policy

- 12.3.5 The key transport-related policies and guidance of relevance to the Proposed Development are contained within the following documents:
- National Policy Statement for National Network (December 2014);
 - National Planning Policy Framework (March 2012);
 - National Planning Practice Guidance: Travel Plans, Transport Assessments and Statements in Decision Making (2014);
 - DfT Circular 02/2013 'The Strategic Road Network and the Delivery of Sustainable Development';
 - West Northamptonshire Joint Core Strategy Local Plan Part 1 (December 2014);
 - South Northamptonshire Local Plan Saved Policies (December 2014);
 - Northamptonshire Transportation Plan (March 2012), including:
 - Northamptonshire Road Freight Strategy (December 2013);
 - Northamptonshire Major Roads Strategy (December 2013)
 - Northamptonshire Bus Strategy requirements (January 2013).
 - A45/M1 Northampton Growth Managements Scheme (March 2012);
 - Highways England Road Investment Strategy 2015 to 2020 (March 2015);
 - Design Manual for Roads and Bridges (DMRB); and
 - Northamptonshire Parking Standards (September 2016).
- 12.3.6 The policy framework of the transport-related policies listed above which are relevant are reviewed in the following sections.

The National Policy Statement for National Network (NPSNN)

- 12.3.7 The purpose of the NPSNN is to set out the importance of delivering Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England to support national and local economic growth and regeneration. Hence, the NPSNN provides direction for NSIPs, including SRFIs, from a planning and design perspective, which the Secretary of State will use to decide whether to consent NSIP applications.
- 12.3.8 The overall strategic aims of the NPSNN and the National Planning Policy Framework (NPPF) are consistent due to both documents' over-arching theme to support sustainable development. However, the NPPF is not intended to contain specific policies for NSIPs. The NPSNN assumes that function and provides the Transport Policy which will guide individual NSIPs brought under it. The NPSNN provides guidance and imposes requirements on matters such as good scheme design, as well as the treatment of environmental impact.
- 12.3.9 The Government's vision and strategic objectives for the national networks is described on page 9 of the NPSNN as follows:
- "The Government will deliver national networks that meet the country's long-term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system. This means:*
- Networks with the capacity and connectivity and resilience to support national and local economic activity and facilitate growth and create jobs
 - Networks which support and improve journey quality, reliability and safety
 - Networks which support the delivery of environmental goals and the move to a low carbon economy
 - Networks which join up our communities and link effectively to each other."
- 12.3.10 A primary concern relating to the national network is the continued dependency on the strategic road network as "...congestion is forecast to grow fastest on the strategic road network" (paragraph 2.19). Paragraph 2.43 of the NPSNN identifies the importance of SRFIs to "...enable freight to be transferred between transport modes, thus allowing rail to be used to best effect to undertake the long-haul primary trunk journey, with other modes (usually road) providing the secondary (final delivery) leg of the journey". Paragraph 2.44 states "The aim of a SRFI is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are important in facilitating the transfer of freight from road to rail thereby reducing trip mileage of freight movements on both the national and local road networks."
- 12.3.11 To facilitate this modal transfer, the NPSNN states that a network of SRFIs is needed across the regions, to serve regional, sub-regional and cross-regional markets. In all cases it is essential that these have good connectivity with both the road and rail networks.
- 12.3.12 The Government has therefore concluded that "...there is a compelling need for an expanded network of SRFIs" (paragraph 2.56).
- 12.3.13 The NPSNN provides specific advice for SRFI development, stating that a project with significant transport impacts should include a Transport Assessment, using the WebTAG methodology stipulated in DfT guidance. If a development is subject to EIA and is likely to have significant environmental impacts arising from impacts on transport networks, the applicant's Environmental Statement should describe those impacts.

- 12.3.14 Paragraph 5.208 states *“Where appropriate, the applicant should prepare a travel plan including management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport and sustainable modes where relevant, to reduce the need for any parking associated with the proposal and to mitigate transport impacts.”*
- 12.3.15 For schemes impacting on the Strategic Road Network, paragraph 5.209 states that *“...applicants should have regard to DfT Circular 02/2013 ‘The Strategic Road Network and the delivery of sustainable development’ (or prevailing policy).”*
- 12.3.16 Regarding SRFIs, paragraph 5.213 states: *“Projects may give rise to impacts on the surrounding transport infrastructure including connecting transport networks. The Secretary of State should therefore ensure that the applicant has taken reasonable steps to mitigate these impacts. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the Secretary of State should expect applicants to accept requirements and/or obligations for funding infrastructure and otherwise mitigating adverse impacts on transport networks...”*
- 12.3.17 Paragraph 5.215 sets out that *“mitigation measures for schemes should be proportionate and reasonable, focussed on promoting sustainable development”*, and at paragraph 5.216 that *“where development would worsen accessibility such impacts should be mitigated so far as reasonably possible”* and that *“there is a very strong expectation that impacts on accessibility for non-motorised users should be mitigated”*. Paragraph 5.218 sets out that *“...travel planning should be undertaken for all major developments which generate significant amounts of transport movement”*.
- 12.3.18 Having regard to the NPSNN, the proposed SRFI access strategy includes measures to connect the main site with the adjacent community and sustainable travel network and includes a separate public transport strategy to ensure, along with the measures set out in the FTP, that travel by sustainable modes are maximised as far as is practicable. Highway mitigation works are proposed to reduce the impact of the development trips on the nearby transport infrastructure to acceptable levels, with the proposed M1 Junction 15 and A45 improvements directly related to the suitability of the site for development of an SRFI.

The National Planning Policy Framework (NPPF)

- 12.3.19 As referred to above, the NPSNN, rather than the NPPF, provides the national policy context for NSIP applications. However, for context with regard to transport issues paragraph 32 of the NPPF guides decision makers to apply the following key principles:
- “the opportunity for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
 - safe and suitable access to the site can be achieved for all people; and
 - improvements can be undertaken within the transport network that cost effectively limits the significant impacts of the development. Developments should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.”
- 12.3.20 There is a requirement to ensure that development generating significant demand for travel is located where it can be accessed by sustainable travel modes and where efficient delivery of goods and supplies can be accommodated.

National Planning Practice Guidance (NPPG): Travel Plans, Transport Assessments and Statements in Decision Making

12.3.21 This document sets out the methodology and requirements for Travel Plans, Transport Assessments and Statements for developments. In determining whether a Transport Assessment and Travel Plan will be needed for a proposed development, this document states that local planning authorities should take into account the following considerations:

- the Transport Assessment and Statement policies, and the Travel Plan policies (if any) of the Local Plan;
- the scale of the proposed development and its potential for additional trip generation;
- existing intensity of transport use and the availability of public transport;
- proximity to nearby environmental designations or sensitive areas;
- impact on other priorities/ strategies (such as promoting walking and cycling);
- the cumulative impacts of multiple developments within a particular area;
- whether there are particular types of impacts around which to focus the Transport Assessment and Travel Plan (e.g. minimising traffic generated at peak times); and
- relevant national policies, including the decision to abolish maximum parking standards for both residential and non-residential development.

DfT Circular 02/2013

12.3.22 DfT Circular 02/2013 'The Strategic Road Network and the Delivery of Sustainable Development' sets out Highways England's (then Highways Agency) policy on how it will engage with local communities and the development industry to deliver sustainable development and maintaining the principal purpose of the SRN.

12.3.23 The policy is intended for all parties involved in development proposals which may result in traffic or other impacts on the strategic road network. The aim of the policy is to cut unnecessary red tape and make the planning process simpler and more straightforward.

12.3.24 Paragraph 9 sets out the broad policy aims of the Circular as it relates to development proposals, stating that "*Development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction)... or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed*".

12.3.25 With reference to decision making regarding developments, paragraph 9 goes on to state "*However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe*".

12.3.26 Circular 02/2013 places an emphasis on the role of sustainable travel modes and travel planning as a means of managing the impact of development on the road network, acknowledging the role that area-wide travel plan initiatives can play to 'free-up' additional capacity, so that travel demand created by a new development can be accommodated.

12.3.27 In assessing development impact, the Circular states, in paragraph 33, that "*only after travel plan and demand management measure have been fully explored and applied will capacity enhancement measures be considered*".

12.3.28 In terms of mitigation of development impact, paragraph 34 states that "*Where insufficient capacity exists to provide for overall forecast demand at the time of opening, the impact of the development will be mitigated to ensure that at that time, the strategic road network is able to accommodate existing and development generated traffic*".

West Northamptonshire Joint Core Strategy (JCS) Local Plan (Part 1)

- 12.3.29 The Core Strategy sets out the long-term vision and objectives for the whole of the area covered by Daventry District, Northampton Borough and South Northamptonshire Councils for the plan period up to 2029, including strategic policies for steering and shaping development.
- 12.3.30 Paragraph 3.6 of the JCS emphasises private sector investment is *“fundamental to the successful achievement of the spatial vision and objectives through the spatial strategy”*
- 12.3.31 The JCS has provided 16 ‘Spatial Objectives’ at paragraph 4.63, which provide the direction for the policies of the JCS, with the relevant listed below:
- Objective 1 - Climate Change
 - Promoting sustainable design and construction in all new developments.
 - Ensuring new developments promote the use of sustainable travel modes.
 - Objective 2 - Infrastructure and Development.
 - Ensure social, physical and green infrastructure is adequately provided to meet the needs of people and business in a timely and sustainable manner, in response to regeneration and new development in West Northamptonshire.
 - Objective 3 - Connections
 - Encourage the use of sustainable travel and consequently promote developments which will maximise the use of alternative travel modes in order to combat congestion, reduce carbon emissions and address social exclusion for those in both rural and urban areas who do not have access to a private car.
 - Objective 8 - Economic Advantage
 - Strengthen and diversify West Northamptonshire’s economy by taking advantage of West Northamptonshire’s internationally well-placed location, strategic transport network and proximity to London and Birmingham.
- 12.3.32 The JSC notes at paragraph 8.16 that *“...in identifying sites for further strategic distribution development regional advice is that priority should be given to sites that can be served by rail freight and operate as intermodal terminals. At the regional level there is strong support for further rail related strategic distribution development and that further provision should be made in the West Northamptonshire area”*.

Northamptonshire Transportation Plan (NTP)

- 12.3.33 The third NTP was adopted in March 2012 and sets out NCC’s long-term visions and objectives for transport and the policies to implement the objectives. The NTP encompasses a selection of ‘Daughter Documents’ and consists of Town and Thematic Strategies. The NTP’s ultimate aim is to accompany the efforts of the Local Enterprise Partnerships in the area to secure the delivery of the JCS and provide a clear transport strategy for Northamptonshire.

12.3.34 The overall vision of the Transportation Plan is provided at page 17 of the NTP, it states: *“For Transport and Travel to contribute towards making Northamptonshire a great place to live and work, through creating tangible transport options to satisfy individual needs and to encourage more sustainable travel. 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 connectivity has a vital role to play in encouraging businesses 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, within a low carbon environment and Northamptonshire will become an exemplar for the latest developments in information technology, fuel technology, and new forms of transport. The County Council will work in partnership with all stakeholders and the wider community to deliver this transport vision and strategy”.*

12.3.35 The following policies are given at pages 58 and 68 of the NTP relevant to the Proposed Development.

“Strategic Policy 2: We will support the introduction of effective and attractive sustainable transport options that will encourage lasting modal shift in Northamptonshire. We have set two targets for modal shift, based on 2001 Census journey to work data, to achieve by 2031:

- A reduction of 5% in single occupancy car journeys to work from the existing built up areas of the towns.
- A reduction of 20% in single occupancy car journeys to work from new developments.”

“Strategic Policy 3: We will ensure that all new developments are well connected by public transport and walking, cycling and motor vehicles routes, to the existing transport network or one that can be reasonable expected to be created – this will allow ease of movement between the development and existing built up areas and provide access to employment and key services.”

“Strategic Policy 19: We will work to improve journey times and reliability on the highway and rail networks in order to increase the efficiency of freight movements and facilitate the local economy to grow.”

Northamptonshire Road Freight Strategy (NRFS)

12.3.36 Northamptonshire Road Freight Strategy (NRFS) is a ‘daughter document’ of the NTP and prioritises the existing road freight implications and measures required to mitigate such impacts.

12.3.37 In the strategic context, the NRFS states at page 15 that: *“The continuing choice of Northamptonshire as a location for distribution activity is dependent on continuing good transport links. Congestion causes delay and leads to unreliability in journey times, which has far-reaching negative consequences for distribution operation. The performance of the strategic road network is therefore of critical consequence. If, or when, it becomes severely congested it poses a threat that could lead to companies re-locating elsewhere. It can also cause rat-running on to less suitable routes”.*

12.3.38 The NRFS provides relevant material to the Proposed Development because the Strategic Road Freight Network identifies the A45, A508, and A43 located to the immediate north, east, and south of the main site as ‘strategic lorry routes’. Consequently, these respective routes, as well as the M1 Motorway, are prominent corridors for heavy goods vehicles (HGV) movements within Northamptonshire.

12.3.39 The NRFS contributes to Northamptonshire's vision given at page 12, to *"encourage the sustainable distribution of goods through minimising road based travel and the associated environmental impacts of road haulage, whilst maintaining economic efficiency and helping to improve the quality of life for the residents of Northamptonshire"*.

12.3.40 To fulfil Northamptonshire's vision of an enhanced road freight network, the NRFS has set out at page 12 six objectives which will provide the framework of the document:

- To mitigate measures related to growing demand;
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- To address the problems caused by HGV traffic in both urban and rural locations and to reduce the impact of HGVs on local communities, especially concerning overnight lorry parking;
- To influence movement patterns and encourage sustainable distribution within the county;
- To encourage commercial and economic growth;
- To reduce the environmental impact of freight movement and reduce the impact of HGV's on inappropriate routes e.g. rural areas, areas in Air Quality Management Areas (AQMA's), and areas with weight restrictions; and
- To manage the network to provide ease of movement through the county and to reduce the impacts of congestion and 'lost productive time.

12.3.41 Further, the NRFS draws out at page 19 the constraints and challenges posed by solely road freight movement, which include:

- The impacts on the SRN as *"lorries are the primary cause of road deterioration"*
- Problems related to *"link speeds, patterns and types of accidents"*
- Challenges to local areas notably; *"pick-up and delivery impacts, parking, noise and vibration emission, bridge strikes and queuing to access delivery sites"*.

12.3.42 Therefore, the relevant constraints of purely road freight operations listed above emphasises the *"ability to move freight by rail is crucial to the economy"* (page 21) which is to become more prominent with the requirements of reducing emissions and congestion.

Northamptonshire Major Roads Strategy

12.3.43 The Northamptonshire Major Roads Strategy is a 'daughter document' of the NTP and concentrates on the main roads outside our larger towns, and complements the Town Transport Strategies which cover the road network within the larger towns.

12.3.44 The Northamptonshire Major Roads Strategy shows how the Major Roads Strategy ties in with the six over-arching Northamptonshire Transportation Plan objectives. Notably, the document outlines at page 10:

- Investment in the highway infrastructure will be important to meet the transport demands of the future, including those arising from new development;
- Highway improvements help to discourage traffic from using unsuitable routes which have an adverse effect on local communities;
- Highway improvements will be planned to make suitable provision for all road users, not just the car;
- Highway improvements can have a significant impact on business, by shortening journey times and improving journey time reliability for key movements;
- Highway improvements can help to reduce congestion and the environmental impact of traffic; and
- Highway improvements need to be developed that offer the best value for money in tackling the problems identified.

Northamptonshire Bus Strategy

12.3.45 The Northamptonshire Bus Strategy is a 'daughter document' of the NTP. Page 7 of the NTP outlines that *"Expanding networks and capacity of networks in Northamptonshire will be fully integrated into new developments and regeneration areas to support more sustainable communities"*.

12.3.46 Therefore, as set out at page 10, the Northamptonshire Bus Strategy aims amongst other objectives to *"increase the attractiveness of bus travel to encourage modal shift and allow the housing growth proposed in the county to be accommodated"*. In doing so, the bus network will provide benefits such as reduced congestion and carbon emissions, and the benefits from ensuring people can have good access to jobs and services and contribute to the economy.

12.3.47 It outlines that in all proposals where Transport Assessments are required, developers shall clearly set out the number of trips expected to be generated by each mode, including by bus. Credible mode shares, when compared with the existing census-derived data for journey-to-work mode, should be set out, having regard to the level of access to high quality bus services.

A45/M1 Northampton Growth Management Scheme (NGMS)

12.3.48 Highways England (formerly the Highways Agency) in partnership with NCC and other local authorities in west Northamptonshire undertook a study of the A45/M1 around Northampton. Following consideration of the forecast strategic road network impacts, it was concluded that the A45/M1 Northampton Growth Management Scheme (NGMS) should be implemented.

12.3.49 Central to potential impacts of developments on the Strategic Road Network (SRN) is a study by the then Highways Agency of the SRN around Northampton, notably the M1 and A45. As reported at paragraph 2.2, the study concluded that *"...there is no feasible and environmentally acceptable solution to accommodating potential peak period traffic demand through large scale capacity improvements to the A45 and its numerous junctions"*.

12.3.50 The study determined the NGMS should be put into operation to satisfactorily cater for the projected development growth (to 2026). Paragraph 2.3 states that the *"NGMS has been designed to ensure that vehicular access and egress onto the SRN is managed effectively and that the safety and free flow of traffic on the A45 and M1 is maintained over the plan period"*

12.3.51 The NGMS includes a list of proposed schemes (Annex 1) which will formulate the overall strategy for improvements to the A45/M1 corridor, consequently accommodating future developments and mitigating the impacts of the potential increase of traffic flows of the SRN in the Northampton area. The schemes comprise:

- M1 J15:
 - Ramp metering on northbound on-slip
 - Exit to A45 expanded from two to three lanes
 - Creation of fourth lane to the M1 southbound off-slip
 - Road markings to be upgraded for the eastern bridge section.
- A45 Wootton Interchange:
 - Ramp metering to be introduced for the northbound on-slip.
- A45 Queen Eleanor Interchange:
 - Upgraded MOVA traffic signals system to be proposed for all existing traffic signals.
 - Introduce ramp metering for the northbound and southbound on-slips
 - For the northbound on-slip, the short merge will be removed and traffic will access the A45 mainline only through the lane gain facility
 - London Road approach to be signalised (including circulatory carriageway)
 - Widening Newport Pagnell Road (B526).
- A45 Brackmills Interchange:
 - Upgraded MOVA traffic signals system for all existing traffic signals
 - Traffic signals at both the Caswell Road approach and entry to the A45 southbound on-slip (from Pavilion Drive).
- A45 Barnes Meadow Interchange:
 - Ramp metering on northbound on-slip
 - Removal of short merge and traffic can only access A45 mainline through the northbound lane gain facility
 - MOVA controlled traffic signals.
- A45 Lumbertubs Interchange:
 - Upgraded MOVA controlled traffic signals system to be proposed for all existing traffic signals
 - Ramp metering to be planned for both northbound and southbound on-slips
 - Removal of short merge on southbound on-slip road meaning traffic can access the A45 mainline only through the lane gain facility.
- A45 Great Billing Interchange:
 - Ramp metering at both northbound and southbound on-slips
 - MOVA controlled traffic signals.

12.3.52 The A45/M1 NGMS Memorandum of Understanding provides an agreed basis for supporting the funding and delivery of the NGMS, including through negotiated contributions secured by Section 106 planning obligations. It is an agreement between Highways England, NCC and the Local Planning Authorities.

12.3.53 Except for the works at M1 Junction 15 (which are not included following advice from Highways England), all other NGMS works are included for in the NSTM2.

Highways England Road Investment Strategy (2015-2020)

12.3.54 The purpose of Highways England's First Road Investment Strategy (RIS1) is to focus on the Strategic Road Network (SRN) by outlining "the foundations for a better future – foundations on which future Road Investment Strategies will build, as we strive to achieve our vision of a revolutionised SRN that will underpin progress and prosperity for generations to come" (page 9).

12.3.55 The RIS1 highlights the impact of increased congestion on the SRN, including an annual cost of £3.7 billion for the freight industry and indicated "*traffic density on UK motorways is 113 million vehicles per mile of road compared to 47 million in Germany and 39 million in France*" (page 19).

12.3.56 Therefore, central to RIS1 is the £15 billion investment which "*has been committed to road investment between 2015 and 2021, with annual funding on enhancements tripling to £3 billion per year by 2021*" (page 19).

12.3.57 Below lists the schemes in vicinity of the site that are described in the current RIS 2015 to 2020:

- M1 Junctions 13 to 19 - The scheme upgrades the M1 to Smart Motorway between Junction 13 (Milton Keynes South) and Junction 19 (M6 Catthorpe interchange). It involves the conversion of the hard shoulder to create a new additional permanent traffic lane, increasing capacity to reduce congestion. Junction 16 to 19 of the works is complete, and construction of Junctions 13 to 16 is due to be constructed between June 2018 and March 2022.
- Improvement to the Abthorpe junction on the A43 near Towcester. Along with the A5 Towcester relief road, the scheme supports the Towcester southern extension and helps remove traffic from the centre of the town. This scheme is completed.
- A5 Towcester Relief Road (scheme committed subject to other contributions) - A new link road to the south of Towcester, agreed as part of the Towcester southern expansion, allowing traffic to bypass the town centre.
- A45/A6 Chowns Mill junction improvement (scheme newly announced in this RIS) - Upgrade of the Chowns Mill junction between the A45 and A6 in Northamptonshire.
- A45 Thrapston to Stanwick (scheme developed for next road period) - Upgrading the existing single carriageway section of the A45 between Stanwick and Thrapston, so the A45 can provide a continuous Expressway between the A14 and the M1.

12.3.58 In addition to the above, Highways England announced a £220 million fund in March 2017 for junction upgrades, roundabout improvement and better traffic signalling for traffic hotspots. This include £3.3 million for improvements to the A5/A508 Old Stratford roundabout. Details of this scheme were obtained from Highways England and are included in the NSTM2.

Design Manual for Roads and Bridges (DMRB)

12.3.59 The purpose of the DMRB is to provide requirements, advice and guidelines for the SRN and is therefore mandatory for all works undertaken on motorway and all purpose trunk roads. In preparing the proposed highway mitigation works associated with the development the DMRB has been applied including relevant Interim Advice Notes (IANs).

12.3.60 The design standards to be used for the assessment and design for the DCO submission were agreed with the Transport Work Group, as set out in TN4 (TA Appendix 9).

Northamptonshire Parking Standards (September 2016)

- 12.3.61 NCC adopted new parking standards in September 2016. The previous countywide parking standards applied a maximum car parking space allowance, as car parking was used as a demand management tool.
- 12.3.62 The aims of the September 2016 parking standards document are provided at page 2, and include *“to support the provision of sufficient, usable parking within development without compromising highway safety whilst supporting good design and sustainable travel.”* The new standards therefore provided minimum car parking requirements. The new standards are the relevant guidance for the Proposed Development and have therefore been applied.

Overall Compliance with Policy

- 12.3.63 The Proposed Development and supporting transport documents listed at Table 12.2 have been developed with due regard to the above policy documents, with emphasis given to the guidance set out in the NPSNN. The proposals include improvements and alterations to both the SRN and local highway network, as well as to sustainable infrastructure and transport services.
- 12.3.64 The policy documents state that development should be sited in sustainable locations with access to existing facilities and services. In the case of an SRFI it is also necessary to identify a suitable location to provide the required connection to the rail freight network, with excellent connections to the SRN. The Proposed Development site achieves these requirements and, as such, meets with the Government Objectives in NPSNN and the national, regional and local transport policies and objectives summarised in this section. It can therefore be concluded that the Proposed Development meets relevant policy guidelines and specific requirements in terms of transport.

12.4 BASELINE CONDITIONS

Site location and context

- 12.4.1 The location of the Proposed Development is described in Chapter 2 of this ES. The existing and committed pedestrian, cycle, public transport and highway infrastructure is described in detail at Chapter 3 of the TA (Appendix 12.1).
- 12.4.2 As the majority of freight in the UK is moved by road, the NPSNN states that proposed SRFI should have good road access, as this will allow rail to effectively compete with, and work alongside road freight to achieve a modal shift to rail. The main site is in a strategically significant location for logistics and distribution activity and, being adjacent to Junction 15 of the M1, it provides excellent road connection opportunities with the rest of the UK, via the M1, M6, A45, A14 and A43. The site is also excellently located in relation to the strategic freight road network in Northamptonshire, which in addition to the SRN, includes the strategic lorry routes of the A508, A428, A509, A43 (north of Northampton), and the A6.

Baseline highway network conditions

M1 Motorway

- 12.4.3 The M1 Motorway is a strategic route for local, regional and international traffic and plays an important role as a direct motorway link between the north and south and a major route connecting some of the largest conurbations in the UK. Near Junction 15 it comprises a standard 3-lane motorway with hard shoulders. This section of the M1 is congested during the weekday morning and evening peak hours and at other times when traffic flows are heavy.

12.4.4 To the north of the Proposed Development, Highways England has recently completed works to up-grade the M1 between junctions 19 to 16, to all lane running as part of the Highways England Smart Motorway Project, which will reduce congestion of this section of the M1. To complement that scheme, Highways England have confirmed works to extend all lane running to include M1 Junctions 16 to 13, this will take the form of 4 lane “all lane running” along with “through junction running” (4 lanes with no hard shoulder) of M1 Junctions 15 and 15A. The SMP is programmed to be constructed between June 2018 and March 2022. However, whilst the works may include reconfiguration of the slip-roads, they do not include improvements to the junctions themselves.

M1 Junction 15

12.4.5 M1 Junction 15 is a tear-drop arrangement incorporating a series of tight radii. The constrained geometry and high traffic demand, particularly during peak times, means the junction is often very heavily congested with peak time queuing on the A45 and A508 approaches to the junction common place.

12.4.6 The M1 off-slips and A45 approach to Junction 15 are controlled by traffic signals, with the A508 and Saxon Avenue approaches operating under a give way arrangement. The junction can be difficult to navigate and the lane allocation around the three-lane circulating carriageways at the A508 and A45 approaches are confusing; for example, vehicles from the M1 northbound off-slip can turn right in all three lanes despite there being two exit lanes onto M1 northbound, whilst vehicles from the bridge can only turn right in two lanes, making it difficult for vehicles at the A508 give way line to judge entry onto the roundabout.

12.4.7 Highways England, as part of their M1/A45 NGMS have identified an improvement scheme for Junction 15. The scheme could potentially provide a capacity improvement of around 9% at the junction. However, this would still leave the junction over capacity at current traffic levels, and Highways England advised that there is no certainty whether an improvement at Junction 15 would be delivered and that this scheme should not be included within the NSTM2.

M1 Junction 15A

12.4.8 M1 Junction 15A is a grade-separated dumb-bell interchange with northern and southern roundabouts connected by a dual carriageway link road which passes underneath the M1 mainline. M1 Junction 15A connects the A43 to the south and the A5123 to the north, which provides access to Northampton. M1 Junction 15A also provides access to the Swan Valley industrial estate and the Northampton Service Station via a series of connected roundabouts.

12.4.9 At peak times, the M1 northbound and southbound off-slips are susceptible to congestion, with queuing and delay experienced on the M1 northbound off-slip especially. Queuing on the A5123 and A43 approaches is less significant in both peak periods.

A45

12.4.10 The A45 London Road forms the main arterial route between the M1, Northampton and the A14 and is of dual carriageway standard throughout the locality. It is subject generally to the national speed limit beyond the immediate confines of M1 Junction 15, where it is subject to a 40mph speed limit. The road carries large volumes of traffic throughout the day and is particularly busy during peak times.

12.4.11 The NGMS recognises the importance of the A45 in helping to support growth and sustain the economy throughout the region. It is agreed with the neighbouring planning authorities and NCC for its future management and safe-guarding. The proposals comprise a series of demand management measures such as signalisation and ramp-metering to limit congestion along the A45 at peak times. The NGMS contains only limited proposals for improving M1 Junction 15, and as described above, Highways England have advised that there is no certainty when that improvement would be delivered, as other NGMS junctions have been identified as priorities.

12.4.12 As a result, and the exclusion of any improvements at M1 Junction 15 from the Smart Motorway Project, M1 Junction 15 will inevitably become more congested in the future

A508

12.4.13 The A508 forms the link with the A5 to the south and M1 Junction 15 to the north. It bisects the village of Roade and passes adjacent to the smaller village of Grafton Regis.

12.4.14 It is a single carriageway road and is an important part of the principal road network, forms part of the strategic freight road network, and it has been identified in the recent DfT consultation as part of the proposed Major Road Network for England. The A508 also forms part of the SRN emergency diversion route for the M1 and A5.

12.4.15 The speed limit varies along the A508, with the northern and southern sections of the road generally derestricted, with 30mph speed limits present through Roade and Grafton Regis, and a 50mph speed limit on the sections to the north and south of Roade, where there is a higher concentration of bends and priority-controlled junctions.

12.4.16 To the south of the Main Site, Blisworth Road (becoming Courteenhall Road to the west) forms a simple priority-controlled T-junction with the A508. Drivers turning right from the A508 into Blisworth Road block southbound traffic on the A508, leading to queuing traffic and delays. There is a concern from residents that drivers use Blisworth Road to 'rat-run' between the A508 and the A43 and vice versa, passing through Blisworth village.

12.4.17 To the south of the Main Site, the A508 passes through the village of Roade, where the alignment is constrained at the Stratford Road/High Street mini-roundabout and over the narrow railway bridge over the West Coast Main Line (WCML). Stop-start traffic is frequently seen and at peak times queues of stationary traffic can quickly develop. HGVs travelling in opposing directions on the A508 bridge over the railway are often obliged to give way to each other as they are not able to pass safely on the bridge structure itself.

12.4.18 Queue surveys undertaken in September 2016 at the A508/High Street mini-roundabout, recorded consistent queuing of up to 100 metres during the morning peak hour on the A508 southbound approach to the junction. During the evening peak hour, queueing was more transient, reaching up to 155 metres on the A508 southbound, and up to 60 metres on the A508 northbound over the railway bridge

12.4.19 Queuing was also observed at on the A508 in each direction at the A508 simple priority-controlled T-junction with Hyde Road, particularly during the morning peak hour around 3 o'clock in the afternoon, when it is likely that the nearby signal controlled crossing was being used.

12.4.20 Hyde Road provides access to the west side of Roade, which is accessed by a further bridge over the WCML. To the west Hyde Road becomes Blisworth Road towards the outskirts of the village. Blisworth Road then becomes Knock Lane, which to the west forms the minor arm in a simple priority-controlled T-junction with Stoke Road.

12.4.21 To the south of Roade, the A508 has a staggered crossroads junction with the C26 Rookery Lane and Ashton Road. Immediately to the south of the junction, there are a series of bends in the A508, which is a known accident hotspot.

12.4.22 To the south of Rookery Lane, the A508 forms the major arm in a priority-controlled junction with the C85 Pury Road, which provides a link through to the A5. A ghost land right turn harbourage facility is provided at the junction for right turn movements from the A508 to Pury Road. The entire length of the Pury Road, between the A508 and A5, is subject to a 7.5T environmental weight restriction, except for access for loading.

Baseline Conditions for Walking, Cycling and Equestrians

- 12.4.23 The existing conditions for pedestrians and cyclist are described in detail in the Walking, Cycling & Horse Riding Assessment Report (TA Appendix 18). The WCHAR Assessment Report describes the pedestrian, cyclists and equestrian facilities within the vicinity of the Proposed Development, including public rights of way (PRoW).
- 12.4.24 Collingtree, Milton Malsor and Grange Park fall within the 2km walking distance of the Main Site and parts of the South Northampton sustainable urban extension, which is a committed development of some 1000 dwellings, would also be within walking distance of the site.
- 12.4.25 A large part of southern Northampton would be within cycling distance of the Main Site, as would several of the surrounding villages, include Roade to the south. Northampton Railway Station is approximately 6km cycle from the main site, which is an acceptable cycle distance for regular commuters.
- 12.4.26 Public footpaths KX13 and KX17 run through the main site. Public footpath KX13 and KG5 provides a connection from High Street, in Collingtree, over the M1 via an existing bridge and across the SRFI site towards the A508. KX17 links with public footpath KX13 which also crosses the SRFI site, linking with the existing bridge over the WCML railway. Footpath KX13 links with footpath RD1, providing access to Blisworth.
- 12.4.27 The existing bridleways including Bridleways KG1, KG2, LD6 and LD7 are located to the immediate north of the SRFI site. The sequence of bridleways links Collingtree with the network of cycleways within East Hunsbury, en-route to Northampton and form part of the Northampton cycle route network.
- 12.4.28 There are a number of existing PRoWs in the vicinity of Roade that would be effected by the proposed Roade Bypass. These are public footpaths KZ30, KZ19, KZ2a, RZ3 and public bridleways KZ10/RZ1 and RZ6 located on the western side of the village.
- 12.4.29 At M1 Junction 15 a shared use footway/cycleway is provided along the western side of the junction, connecting with the short section of footway/cycleway on the western side of A45 and the existing footway provided along the western side the A508. A separate footway/cycleway link is provided across the A45 on the northern part of Junction 15, to connect with the footway/cycleway on the northern side of Saxon Avenue. A narrow footway is provided on the eastern side of the A45 as far north as public footpath LF2. Except for the M1 northbound on-slip, which is provided with a controlled signalised crossing, all other crossings at the junction do not have their own dedicated signal, but can be crossed on a 'walk with traffic' basis (i.e. when the main traffic signals are on red).
- 12.4.30 To the north of the A45/Watering Lane junction a shared use footway/cycleway is shown on the Northampton Cycle Map to the north of Watering Lane, alongside the western side of the A45. It connects Watering Lane into the wider Northampton cycle network. However, to the north of M1 Junction 15 the current facility terminates at the A45 layby and therefore there is no connection currently provided between M1 Junction 15 and facility to the north of Watering Lane.
- 12.4.31 There is network of cycle facilities and 'Advisory Routes' within East Hunsbury that provide onwards connection to Northampton and are accessible via Collingtree. There is also a network of cycle facilities within Grange Park, providing onwards links to the Wootton and Hardingstone residential areas.
- 12.4.32 NCN Route 6 is located to the east of the Main Site. The route encompasses Quinton, Hardingstone (including the Hardingstone SUE), and Brackmills Industrial Estate, en-route to Northampton town centre.

- 12.4.33 There are no walking, cycling or horse-riding facilities provided at M1 Junction 15A. However, there is an existing uncontrolled at grade crossing point on the A43 approximately 70m south of the junction, linking public footpath KX2 with LA13. The crossing is located where the A43 northbound approach is proposed to be widened to accommodate an additional flared lane.
- 12.4.34 The Grand Union Canal is located to the west of the study area and provides a towpath route connecting Milton Keynes with Northampton. There are currently no dedicated off-road cycle facilities provided on the A508 or within Roade.
- 12.4.35 Signal controlled crossings are provided on the A508 at three separate locations within Roade providing priority for pedestrians wishing to cross. A number of at grade pedestrian crossings with central refuges are also provided within Roade allowing pedestrians to cross the A508 in two stages.
- 12.4.36 A narrow footway is provided on the northern side of the C26 Rookery Lane linking the footway on the western side of the A508 at the A508/Rookery Lane/Ashton Road junction, with those provided within Stoke Bruerne. There are no footways provided on the eastern side of the A508 or the C26 Ashton Road.
- 12.4.37 Footways are provided on each side of the A508 in along its frontage with Grafton Regis, but no pedestrian crossing facilities are provided on A508. To the south of Grafton Regis there is no footway on the A508 until the junction for Yardley Gobion
- 12.4.38 There is a continuous, but narrow, footway along the western side of the A508 from M1 Junction 15 to the bridge over the Grand Union Canal, near Stoke Bruerne, where it then switches to the eastern side for approximately 600m. Beyond this, and until the Pury Road junction, there is no footway on the A508, although a continuous link between the two points is provided by a footway alongside the adjacent access road. At the Pury Road junction the footway crosses back over to the western side, from where a continuous facility is provided linking with Grafton Regis.
- 12.4.39 Overall, there are some opportunities for pedestrian travel associated with the Proposed Development, but these will be relatively limited due to the restricted number of residential areas within an acceptable walking distance. Pedestrian journeys will however continue to play an important role, as promoting sustainable integrated transport involves providing good pedestrian links to public transport facilities. There are good opportunities for cycle travel associated with the main site, with a large part of south Northampton falling within an acceptable cycling distance.
- 12.4.40 The M1 could however provide a barrier to travel to and from the northeast of the main site. The development should therefore examine the opportunities to improve and enhance the existing links over the M1 bridge connecting with High Street in Collingtree and at M1 Junction 15.

Baseline Public Transport Conditions

- 12.4.41 The existing public transport services near the main site are described in the PTS (TA Appendix 2).
- 12.4.42 At present, the Main Site has limited accessibility by bus, with Services 33/33a, X4 and X7 operating along the A508 and passing by the main site. The X4 and X7 are both express limited-stop services, with the nearest stop to the main site being north of Roade. The services begin operation just after 0630 hours and finish before 2100 hours. The 33/33A is a frequent stop service that runs hourly (combined) between 0900 hours and 1800 hours, serving stops to the south of the main site near the A508/Blisworth (Courteenhall) Road junction.

12.4.43 This means that there are no services operating by the Main Site at 0600 hours and 2200 hours, which are key shift changes for the Proposed Development. Public transport accessibility is better during the day, with a travel time of less than 30 minutes to Northampton Town Centre. However, in line with the Northamptonshire Bus Strategy requirements, an hourly service will not be adequate to meet the needs of employees and make public transport an attractive alternative to the private car. A comprehensive strategy to ensure that the development site is accessible by bus is therefore proposed in the PTS.

12.4.44 The nearest railway station to the site is Northampton, on the WCML loop from Birmingham to London. There is a traffic free/lightly trafficked cycle route to the station although it is approximately 6km from the Northampton Gateway SRFI site. The railway station is served by a good service to and from Rugby, at least every 20 minutes at peak times, together with direct trains to London and Birmingham. The opportunity will therefore exist in the future for staff to travel by train to Northampton and complete their journey either by cycle or via the connecting bus services.

Baseline Highway Safety Conditions

12.4.45 An assessment of the accident data on the road network impacted by the Proposed Development has been undertaken. This is reported in the Personal Injury Accident (PIA) Assessment report provided at Appendix 3 of the TA.

12.4.46 The assessment identifies the following clusters and trends in PIAs that suggest existing problems:

- M1 Junction 15 - a cluster of six PIAs at the M1 southbound off-slip/A45 northbound exit at the junction, indicative of congested traffic conditions.
- M1 Junction 15 - a cluster of four PIAs on the A508 northbound approach to the junction, comprising a combination of rear end shut and collisions on the circulatory carriageway and at the give way.
- M1 Junction 15A - a cluster of five PIAs on the A43 eastbound approach to the southern roundabout, and a cluster of three PIAs on the circulatory carriageway passing this approach towards the A43 north.
- Queen Eleanor Interchange – small clusters of PIAs on each approach to the junction, indicative of the busy conditions at the interchange.
- A45 – driver error was a prominent factor, including sudden braking, rear end shuts, and travelling too fast for the road conditions.
- A508/Blisworth Road (Courteenhall) junction – a cluster of four PIAs at the junction, including one driver turning right into the Blisworth Road in an inappropriate gap in northbound traffic, and two rear end shuts on the A058 associated with traffic being held up at the junction.
- A508 bend to south of Blisworth Road (Courteenhall Road) – a cluster of four PIAs, three of which relate to loss of control and drivers travelling too fast of the road conditions.
- A508 bends south of Rookery Lane/Ashton Road crossroads - a cluster of accidents on the bends to the south of the crossroads, suggesting a trend of drivers travelling too fast in adverse road conditions, as the majority of the PIAs occurred in wet/damp or frost/icy roads conditions.
- A43/Towcester Road – a cluster of four PIAs, all involving vehicles turning right from the A43 into Towcester Road.

12.4.47 At the remaining PIA study areas, the assessment did not identify any specific locations or trends where the Proposed Development could exacerbate existing traffic safety issues.

12.4.48 Road safety of the proposed highway improvements has been considered via the Stage 1 Road Safety Audit process and Design Team Response Report which are included at Appendices 31 and 32 of the TA.

12.5 ASSESSMENT OF LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS

Transport Modelling

- 12.5.1 The Transport Working Group required that at a strategic level the transport effects of the proposed development scheme be modelled using the NSTM2. WSP Ltd maintain and operate the NSTM2 on NCC's behalf and have undertaken all strategic modelling work, with outputs provided to the Transport Working Group.
- 12.5.2 The NSTM2 has undergone a recent major update by WSP, including a full calibration and re-validation process, including all appropriate committed and allocated development, thereby ensuring consistency with the adopted Core Strategy Local Plans. In addition, a comprehensive process of calibration and re-validation of the areas of the model to the south of the M1 and the surrounding villages has been undertaken to ensure that the existing baseline conditions in these areas are accurately understood and represented in the NSTM2.
- 12.5.3 It was agreed with the Transport Working Group that the multi-modal facility of the NSTM2 would not be used. Instead appropriate modal split targets for public transport and other sustainable travel modes are identified in the FTP (TA Appendix 1) and a separate Public Transport Strategy (TA Appendix 2) has been developed in consultation with NCC and the bus operator. This approach, with no allowance for modal shift in the modelling ensures a robust, or 'worst-case' approach.
- 12.5.4 The Transport Working Group also requested that assessment of the vehicle impacts be undertaken using the vehicle trip generation without considering the effect of the FTP or PTS on modal share.
- 12.5.5 The development trip generations include in the NSTM2 modelling for all development case scenarios (both with and without highway mitigation) reflect the baseline model split for single occupancy vehicle (SOV) trips of 92%. Therefore, whilst this approach was undertaken in accordance with the requirements of the Transport Working Group, it presents a worst case, as it does not include for the required 20% reduction in SOV journeys to and from the SRFI site that is the target identified in the FTP. With the PTS and Travel Plan operational, trip generation would be reduced in comparison to that assessed and residual traffic impacts would also be reduced.
- 12.5.6 The assessment scenarios to be modelled using the NSTM2 were agreed with the Transport Working Group, as described in Chapter 6 of the TA and summarised at Table 12.3, below.
- 12.5.7 An iterative assessment and design process has been followed, in which the need for highway interventions have been identified using the NSTM2, by comparing the modelling outputs from the difference assessment scenarios. This has then been followed by detailed analysis using industry standard assessment tools and, in the case of the SRN, micro-simulation, to develop appropriate highway mitigation works. This work is described at Chapters 7 to 10 of the TA.

Table 12.3: Transport modelling assessment scenarios

Scenario	ID	Description
Reference Case	B1	2021 Opening Year
	C1	2021 DfT 02/2013 Circular Compliant
	D1	2031 Future Year
Development Case no highway mitigation works	E1	2021 Opening Year
	F1	2021 DfT 02/2013 Circular Compliant
	G1	2031 Future Year
Development Case with highway mitigation works	H1	2021 Opening Year
	I1	2021 DfT 02/2013 Circular Compliant
	J1d	2031 Future Year

12.5.8 The highway mitigation works have then been coded into the NSTM2, and the model re-run to confirm that the proposed highway improvements achieve the required outcomes as part of the iterative process referred to above.

Traffic flows

12.5.9 The assessment scenarios include the 2021 Opening Year and 2031 Future Year. The 2021 Opening Year scenarios consider the traffic conditions with, and without, the first phase of the Proposed Development being operational. The 2031 Future Year scenarios consider the traffic conditions with, and without, all the development being operational.

12.5.10 The greatest environmental change will generally be when the development traffic is at the largest proportion of the total flow, which has been taken to be on completion of the proposed development. Hence the 2031 Future Year traffic flows from the NSTM2 scenarios are used to undertake assessment of the transport environmental effects of the Proposed Development.

12.5.11 The peak hours (0800-0900 and 1700-1800 hours), represent the time periods when background traffic flows are at their greatest and therefore the available capacity of the highway network is at its lowest. Hence these are the assessment periods used in the detailed modelling work. The development's traffic flows would also be spread throughout the day and therefore, where appropriate, likely effects based on 24-hour annual average daily traffic flows (AADT) are examined. The methodology for the calculation of the AADT flows is provided at Appendix 32 of the TA.

Study area

12.5.12 A full description of the transport modelling, including use of the NSTM2, is provided at Chapter 6 of the TA

12.5.13 An iterative assessment process was followed as it was found that progressive elements of the proposed highway mitigation resulted in background traffic reassignment of sufficient magnitude to require representing in the NSTM2. This is because the proposed highway improvements associated with the the Northampton Gateway SRFI release existing bottlenecks on the highway network. It was therefore important that all reassignment effects were appropriately represented in the NSTM2 at each incremental stage in the evolution of the highway mitigation, and prior to the residual highway impacts of the scheme on the wider study area being assessed.

12.5.14 Therefore, areas local to the development, where impacts would be greatest were first considered:

- the SRFI access;
- M1 Junction 15, and
- the village of Roade;

12.5.15 Then, as traffic reassignment effects were understood and modelled in the NSTM2, areas moving outwards were assessed:

- M1 Junction 15A;
- the A508 corridor, including Blisworth Road and Knock Lane;
- impacts north of the M1 including the A45; and
- the A5076 corridor.

12.5.16 The transport modelling assessment process has resulted in a significant body of work that is presented at Chapters 7 to 10 of the TA and in the following Technical Notes:

- TN5 - M1 Junction 15 (including A45 improvements) (TA Appendix 10)
- Roade Bypass Options Report (TA Appendix 20)
- TN6 - M1 Junction 15A (TA Appendix 11)
- TN7 - A45 Queen Eleanor Gyratory & Wootton Interchange (TA Appendix 12)
- TN8 - A508 Corridor (TA Appendix 13)
- TN9 - Layby Surveys (TA Appendix 14)
- TN10 - Impacts north of the M1 including the A45 corridor (TA Appendix 15)
- TN10A - Impacts north of the M1 including the A45 corridor (Addendum) (TA Appendix 16)
- TN11 - Impacts at junctions along the A5076 corridor (TA Appendix 17).

12.5.17 Collectively, this body of work identified the study area agreed with the Transport Working Group for more detailed assessment. The study area is shown at Figure 6.1 of the TA, and comprises the following junctions:

1. M1 Junction 15
2. M1 Junction 15A
3. A508/SRFI access
4. A45/C67 Watering Lane priority-controlled T-junction
5. A508/Blisworth (Courteenhall) Road priority-controlled T-junction
6. A508 Northampton Road/Roade Bypass roundabout
7. Blisworth Road/Knock Lane/Roade Bypass roundabout
8. A508 Stratford Road/Roade Bypass roundabout
9. A508/C26 Rookery Lane/C26 Ashton Road staggered crossroads
10. A508/C85 Pury Road ghost island priority-controlled T-junction
11. C27 Stoke Road/Knock Lane priority-controlled T-junction
12. A45 Wootton Interchange
13. A45 Queen Eleanor Interchange
14. A45 Brackmills Interchange
15. A45 Barnes Meadow Interchange
16. A45/A43 Lumbertubs Interchange
17. A45 Great Billing Interchange
18. A5076 Danes Camp Way/A5076 Mere Way/Towcester Rod gyratory
19. A5076 Danes Camp Way/Hunsbury Hill Avenue/Hunsbarrow Road/Hunsbury Hill Road roundabout
20. A5076 Danes Camp way/A5123 Upton Valley Way/A5075 Upton Way gyratory
21. A4500 Weedon Road/A5076 Upton Way/Tollgate road gyratory
22. A5123 St Peters Way/A508 Bridge Street/A5123 Victoria Promenade gyratory
23. A5123 St Peters Way/A4500 St Peters Way/A508 Horseshoe Street/ /Towcester Road gyratory

24. A508/Northampton Road (in Roade)

25. A508/Hyde Road (in Roade)

26. A508/High Street mini roundabout (in Roade)

27. High Street/Courteenhall Road/Northampton Road (in Blisworth)

12.5.18 In addition, the forecast traffic flows change on Knock Lane and Blisworth Road (Roade), and on the A508 adjacent to Grafton Regis are also considered.

12.5.19 Where capacity remains, and a junction or link continues to perform within capacity, then the degree to which spare capacity is eroded by the development is not relevant. Where junctions are already over capacity, or would be taken so by the development, then the potential effects of the scheme are assessed. These would manifest themselves in the form of increased queuing and delays to existing traffic, which would all be **adverse** impacts. Where journey times are shortened or queues reduced because of the improvement works, then the impacts would be **beneficial**.

12.5.20 Other considerations such as road safety may also be impacted upon, so this aspect is also considered as a potential effect as well as highway capacity.

12.5.21 In addition to the above, and in accordance with the DMRB Volume 11, the potential environmental effects associated with the new transport infrastructure fall under three general headings:

a) Disruption due to construction;

b) Operational impact on pedestrians, cyclists, equestrians and the community (termed pedestrians and others), as follows:

- Journey length and local travel patterns – defined as both the distance travelled, and time taken, for pedestrians and others;
- Amenity - defined as the relative pleasantness of a journey for pedestrians and others;
- Severance - defined as the separation of residents from facilities and services they use within their community, caused by new or improved roads or by changes in traffic flows.

c) Operational impact on vehicle travellers, as follows:

- Driver stress - defined as the adverse mental and physiological effects experienced by a driver passing through a road network; and
- View from the road - defined as the extent to which travellers, including drivers, are exposed to the different types of scenery through which a route passes.

12.6 DESIGN OF PROPOSED DEVELOPMENT

- 12.6.1 The Proposed Development will provide improved road access, improvements to public transport services, and improved facilities for pedestrians and cyclists. Unless otherwise stated, all drawings referred to in this section are separate application documents and are referred to by the appropriate DCO document number.
- 12.6.2 The scope of the design works to be submitted with the DCO application has been agreed with Transport Working Group, as set out in TN4 (TA Appendix 9).

Highway mitigation strategy

- 12.6.3 The baseline conditions conclude that the constrained geometry of M1 Junction 15 and high traffic demand, particularly during peak time, means that the junction is often very heavily congested and an existing bottleneck for traffic using the A508 and A45. The assessment work presented in Chapters 7 and 8 of the TA confirmed that existing congestion at M1 Junction 15 would worsen with background traffic growth and, without mitigation, the junction performance would deteriorate further with the addition of the development traffic.
- 12.6.4 The need for a significant and comprehensive improvement scheme at M1 Junction 15 was therefore identified as a requirement for the project. In addition, due to the existing conditions at Roade, with the A508 bisecting the village and the existing congestion issues at the mini-roundabout and the narrow railway bridge, it was determined that the increases in traffic passing through the village because of the development proposals would not be an acceptable impact (TA Chapter 7). Therefore, in consultation with NCC, an early concept for the highway mitigation strategy was the inclusion of a new Roade Bypass to take through-traffic, particularly HGVs, out of the village. It was considered that a Roade Bypass would also be important in drawing development and background traffic back onto the A508 and away from local rural routes that are used as an alternative to the A508 due to the constrained nature of the road as it passes through Roade.
- 12.6.5 The overall package of highway mitigation works evolved from this starting point. The assessment process is described in full at Chapter 6 of the TA. It followed an iterative design and assessment methodology, using traditional assessment based on the observed traffic count data, strategic modelling using the NSTM2, and detailed transport modelling including VISSIM micro simulation. The latter identified the need for an improvement scheme at M1 Junction 15A.
- 12.6.6 A key finding, reported in Chapter 8 of the TA, of the combined impact of the proposed improvement works at M1 Junction 15 and the A508 Roade Bypass, is that existing traffic is forecast to be drawn back onto the SRN and principal road network, particularly the A508. This is a beneficial impact since these are the roads most suited for that traffic and there is a consequential reduction in traffic on the surrounding local roads and some of the surrounding villages (see paragraphs 12.7.56 and 12.7.59). However, to ensure that the A508 can accommodate the traffic increase, a series of improvements are identified along the road as part of the proposed A508 route upgrade.

12.6.7 The resulting overall highway mitigation strategy is shown diagrammatically at drawing NWG-BWB-GEN-XX-SK-C-SK28-S1-P10 of the TA and comprises the following:

A508 SRFI access

- Construction of a new roundabout on the A508 Northampton Road to serve as the access to the Development, configured to require all departing HGVs to travel north to M1 Junction 15; and
- Dualling of the A508 carriageway between the new site access roundabout and M1 Junction 15.

Bypass Corridor

- Construction of a new Bypass west of Roade between the A508 Northampton Road to the north of Roade and the A508 Stratford Road to the south of Roade, including a four arm roundabout connecting the Bypass to Blisworth Road;

Highway mitigation works/measures

- Significant enlargement and reconfiguration of M1 Junction 15;
- Widening of the A45 to the north of M1 Junction 15 and the signalisation of the Watering Lane junction;
- Alteration of M1 Junction 15A to provide an additional lane and signalisation on the A43 northbound approach, signal control and additional flared lane on the A43 eastbound approach, an additional lane on the A5123 southbound approach and circulatory carriageway widening;
- 7.5T environmental weight restriction (with access permitted for loading, that would complement existing restrictions:
 - throughout Roade;
 - along Knock Lane/Blisworth Road between Roade Bypass and Stoke Road;
 - along Blisworth Road (Courteenhall Road) between the A508 and High Street, including parts of Blisworth;
 - along the unnamed road between the A508 and Quinton;
 - throughout Stoke Bruerne and Shutlanger; and
 - Wootton & East Hunsbury, to the west of the A45, east of Towcester Road and south of the A5076.
- Alterations at key locations along the A508 as part of an 'A508 route upgrade'; comprising:
 - Blisworth (Courteenhall) Road junction improvement;
 - C26 Rookery Lane/Ashton Road junction improvement;
 - C85 Pury Road junction improvement;
 - C27 Stoke Road/Knock Lane junction improvement and additional widening to Knock Lane/Blisworth Road (although not on the A508, this is required as a result of changing traffic volumes on the A508); and
 - Provision of a pedestrian crossing at a bus stop and ghost island in Grafton Regis.

12.6.8 A financial contribution will also be provided to NCC for:

- capacity improvement schemes at the A45 Queen Eleanor Interchange and at junctions along the A5076, extending between the A45 and A5123; and
- a Knock Lane and Blisworth Road maintenance and minor works fund, to be used in the event that the increased use of the roads should advance the need for maintenance or other remedial works.

Site access

12.6.9 Access to the Proposed Development would be taken from a new roundabout on the A508 that runs alongside the eastern boundary to the main site. The approximately 500m section of the A508 between the site access roundabout and M1 Junction 15 would be upgraded to provide a dual carriageway. This would comprise two lanes in the southbound direction and three lanes in the northbound direction. The general arrangement of the proposed site access junction is shown on DCO Highway Plans 2.4B.

12.6.10 An integral part of the access layout is the provision of a segregated left turn lane for traffic travelling northbound to M1 Junction 15. The roundabout will include a height barrier (within the private estate road) to prevent HGVs turning right at the roundabout, thereby requiring all HGVs departing the site to travel north on the A508 and access the wider highway network via M1 Junction 15.

12.6.11 This physical enforcement of the site access layout will be supported by the installation and use of Automatic Number Plate Recognition (ANPR) enforcement cameras on the site access arm of the roundabout and on the A508 to the south of the access roundabout. The cameras will record the number plates of all departing HGVs and these will be matched with the number plates of HGVs travelling southbound on the A508. HGV drivers found to be disregarding the HGV right turn ban, for example by U-turning at M1 Junction 15, will thus be identified and the relevant site occupier subject to an enforcement regime.

M1 Junction 15 and A45 major upgrade

12.6.12 The general arrangement for the M1 Junction 15 and the A45 major upgrade are shown on DCO **Highway Plans 2.4A and 2.4B**. The works consist of the following elements:

- Enlargement of both the northern and southern dumbbell 'roundabouts';
- Realignment and widening on the A45 approach to the junction to provide five lanes;
- Signalising and widening of the Saxon Avenue approach to the junction;
- Longer section of three lanes on the M1 northbound off-slip, widening to five lanes at the stop line;
- Dualling of the A508 approach and exit, with five lanes provided at for the A508 northbound at the stop line;
- A cut-through for M1 northbound traffic to the A45;
- Widening on the M1 southbound off-slip to provide six lanes at the stop line;
- A45 northbound widened to provide three lanes from J15 to beyond C67 Watering Lane junction;
- Watering Lane junction with the A45 signalised;
- Change to the speed limit on this section of the A45 to become 50mph;
- Removal of the northbound parking lay-by; and
- Removal of two bus stop lay-bys, with a replacement bus stop provided on C67 Watering Lane.

- 12.6.13 The layout would also include improved routes for pedestrians and cyclists travelling across the junction, who would be provided with traffic signal controlled facilities at each crossing location. Further details are provided at paragraphs 12.6.33.
- 12.6.14 The scheme has been developed with regard to the committed M1 J13 to J16 Smart Motorway Project (SMP), which is due to be constructed between June 2018 and March 2022.
- 12.6.15 It is understood and agreed with the Transport Working Group that the SRFI scheme needs to include for the eventuality that the SMP is not constructed or is materially delayed. In this eventuality the general arrangement for M1 Junction 15 as shown on DCO **Highway Plans 2.4T and 2.4U** would be provided in lieu of the scheme shown on the DCO **Highway Plans 2.4A and 2.4B**. If this were to be implemented, then, as with the proposed scheme which includes the SMP, the SRFI scheme would obtain the necessary detailed design approvals in accordance with the protective provisions within the DCO.

M1 Junction 15A improvement works

- 12.6.16 The VISSIM micro-simulation modelling presented at Chapter 10 of the TA and demonstrates that in the 2031 D1 Reference Case scenario existing congestion at M1 Junction 15A is forecast to lead to significant congestion at the junction, resulting in queues forming on the slips roads that would block back to the M1 mainline. As demonstrated at Chapter 8 of the TA and TN6 (TA Appendix 11), the addition of the development traffic was shown to cause further reassignment of existing traffic onto alternate routes because of this congestion, potentially leading to impacts at other locations. Therefore, an improvement scheme is proposed.
- 12.6.17 The general arrangement for the proposed highway improvement scheme at M1 Junction 15A is as shown at DCO **Highway Plans 2.4F**. The improvement comprises alterations to both the southern and northern roundabouts:
- Southern roundabout:
 - Provision of an additional flared lane and signalisation of the A43 northbound approach;
 - Signalisation and provision of a short flare on the A43 eastbound approach; and
 - Circulatory carriageway widening.
 - Northern roundabout:
 - Signalisation of the A43 northbound entry;
 - Provision of an additional flared lane on the A5123 approach to the roundabout; and
 - Circulatory carriageway widening.

A508 Roade Bypass

- 12.6.18 The A508 Roade Bypass proposal is for a 100kph design speed single carriageway road around the western side of the village, with foot and cycle provision along the length of the route, with tree planting, environmental bunding and general landscaping. The options for the proposed Bypass and the reasons for the selected route are discussed in Roade Bypass Options Report provided at Appendix 20 of the TA, along with the reasons for the selected route. The general arrangement of the proposed scheme is shown on DCO **Highway Plans 2.4C and 2.4D**.

12.6.19 The proposals comprise:

- The construction of a new highway linking the A508 Northampton Road to the A508 Stratford Road;
- The provision of roundabout junctions between the Roade Bypass and the A508 Northampton Road, A508 Stratford Road and Blisworth Road (in Roade);
- Drainage swales and attenuation features;
- A bridge over the west coast mainline railway;
- An underpass for bridleway RZ1/KZ10;
- The alteration and diversion of other existing public rights of way;
- The construction of a shared use footway and cycleway; and
- Environmental mitigation bunds.

12.6.20 Passive provision has been made in design of the A508 Roade Bypass and roundabout junctions to not prejudice the future dualling of the route.

A508 corridor - route upgrade

12.6.21 A beneficial outcome of the M1 Junction 15 and A45 major upgrade and providing the A508 Roade Bypass is that background traffic is drawn back onto the A508. Therefore, in addition to the Roade Bypass, mitigation works are proposed at key locations on the A508 corridor to ensure that the route operates satisfactorily and safely. The route upgrade comprises:

- Alteration to the A508/Blisworth (Courteenhall) Road T-junction to become a left-in left-out only junction the general arrangement of which is as shown in DCO **Highway Plans 2.4C**. This would include the relocation of the existing bus stop currently located to the south of Blisworth Road approximately 70 metres further south;
- Alterations to C27 Stoke Road/Knock Lane priority T-junction to widen the carriageway and improve the highway drainage, and additional widening to Knock Lane/Blisworth Road (Roade), the general arrangement being as shown in DCO **Highway Plans 2.4F**;
- A capacity and road safety improvement scheme at the A508/C26 Rookery Lane/C26 Ashton Road crossroads to provide a single lane dualling staggered crossroads, the general arrangement being as shown in DCO **Highway Plans 2.4E**;
- Alteration to the A508/C85 Pury Road ghost island T-junction to increase the storage area for traffic turning right from the A508 the general arrangement being as shown in DCO **Highway Plans 2.4F**; and
- A new pedestrian refuge on the A508 at Grafton Regis to assist with crossing to the northbound bus stop, and provision of a right turn harbourage facility for northbound traffic from the A508 turning in to Church Lane, the general arrangement being as shown in DCO **Highway Plans 2.4F**.

Speed limits

12.6.22 To complement the changes in road layouts, some changes to the existing speed limits are proposed on the A45 and A508. The proposed changes are shown at the DCO **Speed Limit Plans 2.7A, 2.7B, 2.7C, and 2.7D**.

12.6.23 In general, the proposed changes to the speed limits will provide a 50mph speed limit on the A45 from the vicinity of the Grange Park merge, through to M1 Junction 15 and along the A508 as far as the Roade.

HGV routing strategy and environmental weight restrictions

- 12.6.24 The Applicant recognises local sensitivities regarding the potential for the SRFI to increase HGV movements on the local roads surrounding the main site. As described at paragraphs 12.6.9 to 12.6.11 the proposed site access on the A508 would be configured to require all departing HGV traffic to travel north, supported by (ANPR) cameras and an enforcement regime to deter U-turning movements at M1 Junction 15.
- 12.6.25 This system would be operational 24 hours a day and would minimise development HGV impacts to the south of the site. During periods when the A508 southbound was required to function as a diversion route it would be possible to temporarily lift the restrictions and allow HGV traffic to follow the diversion route without penalty. HGV right turn movements would be facilitated by raising the height restriction at the site access and no enforcement of the ANPR cameras would be made. However, this would only occur following notification from the highway authorities of an official diversion route using the A508 southbound, as described at Chapter 3 of the TA.
- 12.6.26 The following 7.5T environmental weight restriction (with access permitted for loading), as shown on the DCO **Traffic Regulation Plans 2.6, 2.6A and 2.6B**, are proposed on the local roads to the south and north of the SRFI site:
- throughout Roade;
 - along Knock Lane/Blisworth Road between Roade Bypass and Stoke Road;
 - along Blisworth Road and Courteenhall Road between the A508 and High Street, including parts of Blisworth;
 - along the unnamed road between the A508 and Quinton;
 - throughout Stoke Bruerne and Shutlanger; and
 - Wootton & East Hunsbury, to the west of the A45, east of Towcester Road and south of the A5076.
- 12.6.27 These measures, in combination with the configuration of the SRFI access and ANPR camera enforcement, and existing environmental weight restrictions, will restrict HGV through traffic from accessing unsuitable local roads, many of which pass through the surrounding villages. HGVs arriving at the SRFI from the south will be restricted to use the A508, including the A508 Roade Bypass, and departing HGVs will be required to exit the SRFI site to the north via the A508 and M1 Junction 15. The proposed environmental weight restrictions in Wootton and East Hunsbury will restrict HGVs from passing through these residential areas.

Walking and Cycling

- 12.6.28 The walking and cycling strategy for the Proposed Development are shown on DCO **Highway Plans 2.4, 2.4A to 2.4F** and on the DCO **Access and Rights of Way Plans (ARoW), 2.3, 2.3A to 2.3E**, and the **Illustrative Masterplan** (DCO document 2.11). The proposed changes to the PRoW on non-motorised users (pedestrian, cyclists and equestrians) are described in the following sections.
- 12.6.29 The Proposed Development will provide new walking and cycling infrastructure connecting the main site with the existing networks in Collingtree, Northampton and Roade.

- 12.6.30 The A508 SRFI access roundabout is shown on DCO Highway Plans 2.4B and DCO ARoW Plans 2.3C. The access would provide a controlled crossing for pedestrians on the A508 northern arm of the roundabout to facilitate access to the new southbound bus stop. A controlled crossing would be provided for pedestrians and cyclists on the segregated left turn exit lane of the SRFI site access arm, with uncontrolled crossings provided on the right turn exit and entry arm to the SRFI site. A shared use footway/cycleway would be provided running around the roundabout and connecting into the site access. The footway/cycleway would extend to connect with the new northbound bus stops that is proposed to the south of the site access roundabout on the A508.
- 12.6.31 It is proposed to extend this new footway/cycleway alongside the west side of the A508 linking the site access roundabout and Roade and the proposed footway/cycleway facility to be provided alongside the western side of the Bypass. When taken together, the proposals would provide a new footway/cycleway connecting Roade with the site and the existing Northampton footway/cycleway network to the north.
- 12.6.32 At the junction with the unnamed road to Quinton, a refuge would be provided on the A508 to assist cyclists wishing to cross to and from the unnamed road. This would provide a link with National Cycle Network Route 6, which is accessible from Quinton.
- 12.6.33 As shown on DCO Highway Plans 2.4B and 2.4C and DCO ARoW Plans 2.3C and 2.3B and the Illustrative Masterplan, a new shared use footway/cycleway is proposed to the northeast of the main site. This would be provided along the western side of the dualled section of the A508 between the site access roundabout and M1 Junction 15. A second pedestrian and cycle access to the SRFI is proposed midway along this section of the A508, providing direct access to the main development spine road. The new footway/cycleway would connect with the existing footway/cycleway facilities at M1 Junction 15, which would be improved to provide traffic signal controlled facilities at each crossing location. A new shared use pedestrian and cyclist link is proposed from M1 Junction 15 linking with Watering Lane to the north.
- 12.6.34 It is proposed to signalise the C67 Watering Lane junction with the A45, with pedestrian crossings to assist pedestrians and cyclists accessing the facility on the northern side of Watering Lane. In addition, an uncontrolled crossing is also proposed between the hotel and the footway on the northern side of Watering Lane.
- 12.6.35 Within the Northampton Gateway SRFI site, shared footway/cycleways would provide access to each of the warehouse development plots and Rail Terminal. Public footpaths KX17 and KX13 that cross the main site would be diverted and extended to form a loop within the landscape bunding. Part of the diverted route would be upgraded to provide a cycle track (for use by pedestrians and cyclists) that would link the bridge over the M1 at Collingtree with the new facility adjacent to the A508 and the improved facilities at M1 Junction 15.
- 12.6.36 The cycle path would extend within the main site to the south of the SRFI access roundabout, thereby providing cycle access to Zone A4 of the main site. To the south of Zone A4 a public footpath would complete the new loop arrangement linking with the existing public footpath and bridge over the West Coast Mainline railway. The changes to the PRow are shown on the DCO ARoW Plans 2.3A to 2.3E in conjunction with the Illustrative Masterplan.
- 12.6.37 To the northeast of the SRFI site, a cycle track (for use by pedestrians and cyclists) would connect the development to Collingtree, and the wider Northampton area, via the existing bridge over the M1. A private footway/cycleway would also connect directly from the bridge to the main spine road, providing direct access into the development from Collingtree and Northampton beyond. These proposals are shown on the Illustrative Masterplan and on the DCO ARoW Plans 2.3A and 2.3B.

- 12.6.38 There are several PRow, including footpaths and bridleways, in and around Roade. PRow KZ30, KZ19, KZ2a, RZ3 and KZ10/RZ1 and RZ6 located on the western side of Roade would be affected by the proposed Roade Bypass as shown on the DCO **ARoW Plans 2.3D and 2.3E**. The scheme would maintain access and connections for pedestrians, cyclists and equestrians using these PRow.
- 12.6.39 At grade crossings are proposed on all three arms of the Roade Bypass/A508 Northampton Road roundabout. As shown on DCO **Highway Plans 2.4D and ARoW Plans 2.3D**, new footways would be provided adjacent to the roundabout to maintain the footpath link between PRow KZ30 and KZ19.
- 12.6.40 Further south along the Bypass, public footpath KZ2a, which runs to the west of the West Coast Mainline railway, is proposed to be diverted. An uncontrolled crossing with refuge island is proposed to cross the carriageway and connect with the shared footway/cycleway on the eastern edge of the Roade Bypass.
- 12.6.41 A roundabout junction is proposed to connect Blisworth Road (in Roade) with the Roade Bypass. A shared use footway/cycleway would be provided around the northern arm of the Bypass, with an at grade crossing of the road. This would link with the proposed footway/cycleway provided along the eastern side of the Bypass and ensure pedestrians and cyclists could continue to access Knock Lane.
- 12.6.42 The two-way AADT for the northern (busier) section of the A508 Roade Bypass would mean that an at-grade crossing would be 'not normally appropriate'. It is therefore proposed to provide a central refuge island at both crossing points which would result in an at-grade crossing being assessed as 'potentially appropriate'. Given the predicted pedestrian flows for the crossings are low this is considered acceptable.
- 12.6.43 Further south along the Roade Bypass it is proposed to provide an underpass crossing for bridleway RZ1/KZ10 beneath the Bypass, this would link bridleway KZ10 with RZ1 as shown on DCO **ARoW Plans 2.3D**. An underpass is considered more appropriate than at grade crossing of the Roade Bypass, given the proximity of the bridleway to stables at Dovecote Farm and its known use by equestrians (also see WCHAR1, TA Appendix 18).
- 12.6.44 A footway/cycleway link is also proposed between the Roade Bypass and the bridleways KZ10/RZ1. The proposed underpass layout and design is shown on Drawing NGW-BWB-SBR-R-DR-CB-0001-S4-P1 included within the TA. It would provide a 4m wide x 3.7m high underpass (3.8m minus 0.1m surfacing). This accords with guidance publicised by the British Horse Society and also the DMRB.
- 12.6.45 The proposed Bypass crosses public footpath RZ3. An at grade uncontrolled crossing with refuge island is proposed to maintain the footpath in an east/west direction.
- 12.6.46 An at-grade roundabout is proposed to the south of Roade to connect Roade Bypass to the A508 Stratford Road, as shown on DCO **ARoW Plans 2.3E**. At grade crossings are proposed on the eastern and southern arms of the roundabout. On the western side of the A508, along the southern arm of the roundabout a footway/cycleway is proposed to link to bridleway RZ6.
- 12.6.47 The proposed scheme involves alteration to the A508/Blisworth Road (Courteenhall) T-junction to become a left-in left-out only junction. This would include the relocation of the existing bus stop currently located to the south of Courteenhall Road, approximately 70 metres further south. There is currently a footway which runs along the western edge of the A508 from north to south past the junction, which would be upgraded to provide a shared use footway/cycleway as part of the new facility linking Roade with M1 Junction 15.

12.6.48 At Grafton Regis a new pedestrian refuge is proposed on the A508 to assist pedestrians with crossing the road to the northbound bus stop. Through Grafton Regis there is a footway on both sides of the A508, these are to be maintained.

12.6.49 The proposals have been subject to a Walking, Cycling & Horse-Riding Assessment Review in accordance with HD42/17. The Assessment Report (WCHAR1) is provided at TA Appendix 18 and the Review Report (WCHAR2) is provided at TA Appendix 19. All opportunities have been reviewed against the scheme proposals and have been positively addressed. Where necessary, changes to the scheme have been incorporated within the drawings accompanying the DCO.

Public Transport Strategy

12.6.50 Public transport will play an important role in providing access for staff coming to the site and the strategy for the development is described in detail in the PTS report provided at TA Appendix 2.

12.6.51 The PTS includes the introduction of a new bus service specifically to serve the main site, as well as building on the existing local bus network through provision of additional capacity and improved infrastructure. The PTS has emerged from discussion with the local bus operator (Stagecoach) and the public transport officers at NCC

12.6.52 The focus of the strategy is:

- The development of a new bus service to/from the Northampton Gateway SRFI site to Northampton Town Centre and associated infrastructure; and
- New bus stops on the A508, giving access to the site for the 33/33a, X4 and X7 Services.

12.6.53 In addition to the above, the FTP (TA Appendix 1) proposes a Sustainable Transport Working Group for the site, led by the area-wide Travel Plan co-ordinator, and formed of key stakeholders (including NCC, public transport operators, car share providers, Highways England etc.) and the Unit Travel Plan Coordinators. Their role will be to oversee the delivery of the Travel Plan, and Bus Strategy, and to review changes in priorities and promotions suggested by the area-wide Travel Plan Co-ordinator, depending on requirements. The Group would meet bi-annually and could develop ad-hoc working groups where specific needs arise at certain times.

12.6.54 Figure 7.1 of the PTS summarises the existing bus services that operate near the site and the proposed new and enhanced bus routes.

12.6.55 The bus service will be developed in line with NCC's adopted Bus Strategy, with regard to the 10% modal share target for bus. Given this, the trigger for providing a bus journey to the site is defined, based on NCC guidelines, as:

A bus journey will be provided between the site and Northampton Town Centre when 100 employees or more start or finish work within a 15minute window (unless an existing journey is available within 30 minutes before the start of shift, or within 30 minutes of the end of shift)

12.6.56 The end occupier's shift patterns, employee numbers and site requirements are unknown at the planning stage, so the strategy needs to be flexible to actual need. Using the trigger ensures that the PTS can be responsive and can develop a bus network that is built around actual demand.

12.6.57 The Sustainable Transport Working Group would also seek to be pragmatic and proactive as the PTS is implemented, seeking opportunities to further develop the bus service wherever feasible. For example, the group could investigate opportunities to develop service frequencies in-between peaks or triggered journeys, to provide a more consistent and regular service throughout the day, when this can be provided at marginal short-term cost, or commercially.

- 12.6.58 The proposed bus service would offer direct access from the site to Northampton Town Centre. The most direct route would see the service following the A508/A45/A508 to The Drapery (or North Gate Bus Station). As well as serving the town centre, the service could also serve stops on London Road (A508). On site, the service would utilise the SRFI access on the A508, penetrate the site serving the bus stops on the spine road and use the turning circle at the westerly end of the site. One-way travel time would likely be 20 minutes, and less in the off-peak. Given the journey length and the requirement of NCC's Bus Strategy to have a 30 minute frequency, a two vehicle operation could serve the site. Timetables would be developed depending on need and examples are provided within the PTS.
- 12.6.59 Four bus stops will be included within the development site, one near the entrance to the site and another two bus stops along the estate road of the development. A final stop will be positioned at the far end of the internal estate road. These bus stops will ensure that employees commuting by bus will not have a long walk from the bus stop to their workplace. Layover facilities will be provided to allow the service to drop off passengers before the start of the shift and then pick up passengers finishing their shift.
- 12.6.60 Three phases to developing the strategy are proposed, enabling it to adapt to demand that arises as new occupiers arrive on site:
- Phase 1: Introduction of the new service at key shift time start/finishes from occupation of the first warehouse unit on the site. This is most likely to be around 0600-1400-2200 hours. However, it will need to be flexible to the end user's requirements. Whatever the shift pattern, public transport would be in place from first occupation to make it an attractive and realistic alternative to the private car.
 - Phase 2a: Development of the service through the day. It is likely that additional journeys will be required between 0800 and 0900 hours and from 1500 to 1800 hours from the third year of development. Given that these services fall at peak times there will be a requirement to add a new bus to the network in Northampton. Rather than provide buses just at these times, the Sustainable Transport Working Group should investigate the opportunity of continuing the bus service in between peaks, potentially at marginal costs, therefore beginning to develop a regular service for users throughout the day.
 - Phase 2b: as the site develops, there will be the need to extend the operating times of the service from 0700 to 0900 hours and 1400 to 1900 hours.
 - Phase 3: Increase the service frequency from hourly to half hourly as demand grows during the peak times, a second bus would be added to the timetable to offer half hourly frequency at certain times.
- 12.6.61 The initial bus service aimed at key shift change-over times would be in place from occupation of the first warehouse unit. Following this, the trigger points would be in line with NCC's adopted Public Transport Strategy recognising the 10% mode-share for public transport.
- 12.6.62 New bus stops and laybys would also be created on the A508 either side of the new site access roundabout, as shown on **Highway Plans 2.4C**, and a controlled crossing provided on the northern A508 arm of the roundabout to provide direct and safe access to the southbound bus stop. This would provide access to an hourly service in each direction between Milton Keynes and Northampton.
- 12.6.63 By offering regular and reliable services, at appropriate times, public transport becomes a viable alternative to the private car from the point of first occupation. In combination with promotion through the site Travel Plan, this will maximise the potential for use by employees as the site grows.

Road Safety

- 12.6.64 All of the proposed highway mitigation works have been be the subject of a Stage 1 Road Safety Audit (RSA) in accordance with HD 19/15 (TA Appendix 30).
- 12.6.65 All recommendations identified within the RSA1 report have been considered within the Response Report (TA Appendix 31). All recommendations have been addressed and, where necessary, changes to the scheme have been incorporated within the drawings accompanying the DCO.

Parking Provision

- 12.6.66 Parking will be provided at the main site in accordance with NCC's latest parking standards (September 2016).
- 12.6.67 The Illustrative Masterplan demonstrates that compliance with these parking standards can be achieved and is summarised at Table 4.1 of the TA.
- 12.6.68 Additional HGV parking will also be provided in the form of a secure, dedicated HGV parking area of approximately 120 spaces. This will include driver welfare facilities to meet the needs of HGV drivers visiting the site or intermodal terminal.
- 12.6.69 As part of the FTP (TA Appendix 1) car sharing will be actively promoted and to encourage this 8% (approx. 320 spaces) of the total car parking spaces would be marked for those car sharing. These spaces would be split between the units and located next to the entrance to the buildings.
- 12.6.70 To encourage the use of electric vehicles 5% (approx. 200 spaces) of the total car parking spaces provided will include electric charging points, with passive provision provided for a further 5% of the total provision.

12.7 RESIDUAL EFFECTS

Disruption Due to Construction

- 12.7.1 The overarching systems and controls that would be adopted during the construction of the Proposed Development and associated highway mitigation works to minimise any adverse environmental impacts are set out in the provisions of the DCO and are detailed within the Construction Environmental Management Plan (CEMP), appended to Chapter 2 of this ES.
- 12.7.2 The CEMP provides the framework with which all Phase specific Construction Environmental Management Plans (P-CEMPs) required for each phase of development by DCO Requirements, must accord.
- 12.7.3 The exact number of P-CEMPs will depend on the precise split of phases of work which has yet to be confirmed. However, it is anticipated that P-CEMPs will be provided for:
- Main site;
 - Railway infrastructure;
 - The Rail terminal;
 - Each phase of the highway works; and
 - Each phase of warehouse development.
- 12.7.4 The Indicative Master Programme is provided at Appendix 2 of the CEMP. It breaks down the construction works into two key components, as listed below:
- Highway works;
 - M1 J15 & A45 major upgrade and link to site access;
 - M1 J15A improvements;
 - Roade Bypass / A508 improvements;
 - Main Site Construction;
 - Bulk earthworks (Phase 1 and 2);
 - Landscaping (Phase 1 and 2);
 - Road Construction (Phases 1 to 3);
 - Construct Rail Terminal; and
 - Buildings.
- 12.7.5 The Indicative Master Programme includes the indicative construction programme showing the above work components. The works would be phased over a 5.5 year period.
- 12.7.6 Prior to occupation of the first building on the site, the following works will have been completed:
- A508 SRFI access and dualling between the site access and M1 Junction 15;
 - M1 Junction 15 and A45 major upgrade;
 - Landscaping phase 1;
 - On site road construction phase 1; and
 - Rail Terminal ('terminal' as shown in box a) of Document 2.8.

- 12.7.7 The construction of the A508 Road Bypass will be governed by the methodology and availability of possessions for the bridge over the WCML. The other highway works on the A508 are associated with the timing of the construction of the A508 Road Bypass and will be completed prior to the opening of the A508 Bypass to traffic.
- 12.7.8 The A508 Road Bypass will be delivered as soon as is practicable, and no later than 2 years following first occupation of the site. However, due to the construction time necessary for the bypass, and timing restrictions associated with installing the bridge over the WCML railway, it would not be in place prior to the opening of the development.
- 12.7.9 The M1 Junction 15A improvements will be complete prior to the opening of the A508 Road Bypass. However, it cannot be constructed at the same time as the M1 Junction J15 and A45 major upgrade and SRFI access to avoid working on two adjacent motorway junctions concurrently.
- 12.7.10 A combination of appropriate temporary diversions and closures to PRoW will be implemented before the commencement of any component of works and details shall be set out in P-CEMPs where appropriate. All permanent routes will be constructed and implemented as soon as practical.
- 12.7.11 The above constraints and other practical restraints regarding the off-site works are set out in the CEMP. However, the importance of managing the phasing of the components to mitigate delays and disruption on the existing highway network is recognised as the most significant practical restraint.
- 12.7.12 Generally, this is best achieved by diverting traffic onto new alignments away from works under construction and controlling the level of interference on the networks at any time. The Indicative Master programme plans the highway works at M1 Junction 15 and A45 and the Road Bypass and A508 improvements to be carried out sequentially, but some overlap of the latter with the M1 Junction 15A should be possible following the detailed design and with agreement from Highways England and Northamptonshire County Council.
- 12.7.13 Construction work within the development site would be confined to the following:
- 07:00 -19:00 hours Monday to Friday;
 - 07:00 -13:00 hours Saturday.
- 12.7.14 All delivery vehicles and plant arriving and leaving the site would also comply with the same time restrictions, although site personnel would be permitted to access the site shortly before these hours and exit the site shortly after them. Construction work outside the development site will require night working to comply with the requirements of Highways England, or for practical and safety reasons.
- 12.7.15 No works will be undertaken on Sundays or public holidays, save in exceptional circumstances only and with prior notification.
- 12.7.16 Access and egress to each part of the off-site construction works would be via a metalled access road joined to the public highway. Access to the main site during the earlier stages of the construction process would be via a new temporary ghost island priority-controlled T-junction construction on the A508. The general arrangement of this is shown at Drawing NGW-BWB-GEN-XX-SK-C-SK07-S3-P4 provided within the TA. Whilst the temporary junction is in place the speed limit on this section of the A508 will be reduced from derestricted to 40mph via a temporary Traffic Regulation Order provided for in the DCO. The temporary junction would be replaced with the site access roundabout as part of the site access construction works prior to first occupation on the main site.

12.7.17 The routing of construction traffic would be agreed with the Police, NCC, Highways England and the Project Manager for each P-CEMP. All contractors shall then comply with the requirements of that strategy. Delivery vehicles would be routed via the principal and strategic road networks to avoid effects on local residential areas. No heavy construction traffic, other than that associated with the construction of the A508 Road Bypass and A508 improvements would be permitted to use the A508 south of the main site.

12.7.18 The impacts of the construction traffic on the operation of the highway network are assessed as Chapter 12 of the TA. In summary, for the construction process, the following assumptions were made:

- A 5.5 years construction period; and
- A 10-hour, five day working week for 49 weeks per year.

12.7.19 Based on the construction programme and total mass of material required for each key works component identified within the Indicative Master Programme, the total numbers of HGV and light goods vehicle (LGV) movements have been estimated. Estimates for the number of construction workers travelling to the site by car and van have also been made. A detailed assessment is included in the Construction Traffic Methodology Report, which is included at TA Appendix 33.

12.7.20 A summary of the estimated average daily construction traffic movements is provided a Table 12.4. This is based on a 5-day working week, assuming 49 working weeks per year. It is therefore a robust assessment as the average excludes Saturday working, the inclusion of which would reduce the overall daily traffic movement figures given in the table.

12.4: Average daily construction traffic movements (one-way)

Year	HGV	LGV	Car	Vans	Total
1	147	33	117	157	455
2	171	39	175	129	515
3	125	28	86	95	334
4	72	14	36	48	170
5	72	14	36	48	170
6	36	7	18	24	85

12.7.21 Based on Table 12.4, Year 2 would be the busiest in terms of HGV and LGV movements associated with the construction process. During Year 2 it is estimated that an average of 171 daily one-way HGV movements would visit the site, with 39 daily one-way LGV movements.

12.7.22 Taken over the 10-hour working day, the above one-way movements would equate to some 34 HGV two-way movements per hour, and around 8 two-way LGV movements per hour. Even allowing for doubling this average figure, to accommodate short periods of peak demand, these flows are low in the context of the adjacent highway network flows, which at M1 Junction 15 average around 6,300 vehicles during each of the morning and evening peak hours. Hence these flows will not require mitigation works.

12.7.23 For construction workers, when taken in total, the busiest period for car and van movements would also be Year 2, when a total of 304 daily one-way movements are forecast. To understand the likely origins of construction staff, the employee trip distribution has been extracted from the NSTM2. This has then been used to establish the traffic impacts on the main routes to and from the site.

12.7.24 It is assumed that the majority of staff (80%) would arrive just prior to the start of work at 0700 hours and leave the site just after at 1900 hours. The resulting cumulative additional trips on the existing highway network are summarised at Table 12.5. The detailed calculations are included at TA Appendix 33.

Table 12.5: Distribution of construction staff arrival and departure trips

Route	Trips
A45	109
M1 South	50
A508	37
M1 North	47

12.7.25 Table 12.5 shows that the traffic impact of the additional journeys associated with construction staff movements to the site in the morning and from the site in the evening would be diluted, as they would be split across a number of main routes. Furthermore, the operation times of the construction site would mean that staff movements do not generally coincide with the highway network peak hours. It is therefore concluded that construction staff movements would not have a material impact on the operation of the existing highway network.

12.7.26 Overall it is concluded that the construction traffic would not result in a material impact on the operation of the existing highway network. The measures and procedures outlined in the CEMP will ensure that any adverse environmental impacts are minimised, and heavy construction traffic would not be permitted to travel on the A508 to the south of the site, thereby avoiding impacting upon local villages.

12.7.27 It is concluded that the construction phase of the development would have a **temporary adverse** impact of **moderate significance** on the operation of the surrounding highway network.

Operation

12.7.28 This section of the ES examines the residual transport impact once the Development would be in operation and the associated infrastructure improvements and other mitigation measures are in place.

12.7.29 The Proposed Development comprises SRF consisting of 'warehousing and distribution' B8 use (Zone A on the Parameters Plan), and the 'intermodal rail freight terminal' (Zone B on the Parameters Plan).

12.7.30 Zone A would take the form of large scale units that would support a combination of B8 uses, with ancillary buildings. The Illustrative Masterplan summarises the gross internal area of each unit shown. As shown, B1 office use would comprise around 5% of the total area and is therefore ancillary to the predominant B8 use.

12.7.31 The Parameters Plan sets out a maximum area for the warehousing and distribution use at the development at 5,037,510sqft (468,000sqm). However, to provide some flexibility for future occupiers seeking mezzanine space, the Parameters Plan includes an allowance for a further 155,000sqm in the form of B8 mezzanine floor space use. For assessment purposes the maximum floor area, including the allowance for mezzanine floor space, is therefore used in this TA.

- 12.7.32 The Parameters Plan includes direct rail served warehouse units by means of dedicated rail connection to development zones A2a, A2b, A3 and A4.
- 12.7.33 The intermodal rail freight terminal and aggregates terminal would take the form of an independent facility and associated container storage provided in Zone B. The loading and unloading sidings and the associated pad would be able to accommodate trains of up to 775 metres in length, to allow the longest trains to be accommodated.
- 12.7.34 There would also be capability to provide a Rapid Rail Facility (RRF) as part of the intermodal rail freight terminal.
- 12.7.35 Container movements to the individual warehouse units on the site would either be direct to the individual warehouse unit (or plot) by rail, by means of an adjacent rail loading/unloading pad, or by delivery of the containers to the main loading/unloading terminal at the intermodal facility, with the containers then being transferred by HGV between the rail terminal and warehouse unit.
- 12.7.36 In keeping with most inland rail freight terminals, the rail freight terminal is likely to operate on a 24-hour basis from Monday to Friday, and until Saturday lunchtime. However, volume growth at the main ports could lead to an increase to 6 or 7-day operation. All the B8 units are likely to operate on a 24-hour basis, seven days a week. The main shifts are therefore likely to be 0600-1400 hours, 1400-2200 hours and 2200-0600 hours, although there will be some variation depending on the individual occupier requirements. For example, some occupiers may operate a 12-hour shift, from 0700-1900 hours and 1900-0700 hours.
- 12.7.37 It is anticipated that it would take several years before the rail freight terminal at Northampton Gateway would operate at full capacity. The rail freight terminal will be operational upon the opening of the development and will have capacity to accommodate at least 4 trains per day. For the purposes of assessment, the opening year capacity is therefore assessed at 4 trains per day. However, to ensure a robust approach, maximum capacity of 16 trains per day to the Intermodal Terminal SRFI site has been assumed to occur within the assessment periods set for the future year transport modelling assessment scenarios.
- 12.7.38 Initially the loading and unloading of containers to and from the rail vehicles at the intermodal terminal would be by reach stacker, which could be replaced by gantry cranes as volumes and throughput at the rail terminal increased.

Modal Shift from Road Freight to Rail Freight

- 12.7.39 The proposed SRFI, comprising both the warehousing and distribution units and the rail terminal, would generate the following type of trips:
1. Employee trips to and from work at both the B8 units and the rail terminal;
 2. Visitor and delivery trips to both the B8 units and the rail terminal;
 3. HGV traffic to and from the B8 units;
 4. HGV traffic to and from the rail terminal;
 5. HGV (or tug) traffic between the rail terminal and the B8 units; and Rail trips.
- 12.7.40 Only trip types 1 to 4 would use the off-site highway network. Trip type 5 would be on the internal road network, between the rail terminal and warehousing area. Trip type 6 would be on the rail network only, and the capacity of the rail network to accommodate these trips is demonstrated in the Rail Capacity Report (DCO document 6.8).

- 12.7.41 The TA therefore focuses on trip types 1 to 4, as the TA is ultimately concerned with the impact of the development on the highway network. However, it is recognised that the number of HGVs generated (trip types 3, 4 and 5) will be related to the number of rail trips (trip type 6) and the size of the containers/type of goods. Furthermore, the amount of external HGV trips (trip types 3 and 4) will be related to the number of internal trips (type 5) and the operation and interaction between the rail terminal and the on-site warehousing.
- 12.7.42 The above dependencies and interactions are examined in detailed at Sections 5, 6 and 7 of TN2 (TA Appendix 5) and are included within the trip generation calculations. Once the rail facilities at Northampton Gateway are fully operational they could accommodate an average maximum through-put of around 1384 containers a day. This is a mode shift from road freight to rail freight equivalent to 969 HGV loads or 1,938 two-way HGV movements per day. Appendix 34 of the TA includes an example of how this could translate to a modal shift from road freight to rail freight. The example demonstrates that, annually, the Proposed Development could remove over 92 million HGV miles per year from the highway network. This equates to over £50 million per year in monetised environmental benefits as calculated using the methodology set out in the DfT Guide to Mode Shift Revenue Support Scheme².
- 12.7.43 Taken together the above reduction in overall HGV mileage on the road network demonstrate how the proposed Northampton Gateway SRFI would comply with Government's objectives, as set out in the NPSNN, to achieve a modal shift from road freight to rail.
- 12.7.44 It is important to understand that many of the remaining HGV trips forecast to be generated by the proposed SRFI development would already be present on the highway network. This is because many of the HGV trips would be associated with the delivery of goods to meet existing business demand in the locality. Such HGV movements would already exist locally to those businesses, and the development of the SRFI would not add additional HGV traffic in these areas. Rather, it will provide a distribution hub, meaning that journey distances will be reduced, reducing overall HGV mileage on the road network as described above.
- 12.7.45 Taken together the above modal shift and resultant reduction in overall HGV mileage represents a **permanent beneficial** impact of **major significance**
- 12.7.46 Nevertheless, to ensure that the full impact of the Proposed Development is modelled in the vicinity of the site, the transport modelling has assumed that all HGV trips would be new trips to the highway network. For the reasons given above, this results in a robust assessment of the traffic impacts as it means that there is some double counting of HGV traffic, particularly on the main links to and from the existing urban and industrial areas, such as Brackmills Industrial Estate, located off the A45.

² DfT Guide to Mode Shift Revenue Support (MSRS) Scheme, April 2015

Development Trip Generation

12.7.47 Chapter 5 of the TA presents the person and vehicular traffic generation calculations for the Proposed Development. The two-way external person trip generation (combined total movements in and out of the site) are summarised at Table 12 and Table 12.7 summarises the vehicle trip generations.

Table 12.6: Off-site person trips (two-way)

Period	Person Trips
AM Peak Hour	1,111
PM Peak Hour	1,393
Daily	17,657

Table 12.7: Off-site vehicle trips (two-way) not accounting for the Travel Plan

Period	Light Vehicles	HGVs	Total
AM Peak Hour	775	269	1,044
PM Peak Hour	1,035	268	1,303
Daily	12,286	4,245	16,531

12.7.48 The vehicle trip generations assume a single occupancy vehicle (SOV) rate of 92%. Whilst this provides a robust position for assessment of the highway capacity, it is not representative of the likely modal share that would be achieved by the Proposed Development once the sustainable transport initiatives presented in the FTP (TA Appendix 1) and the PTS (TA Appendix 2) are considered.

12.7.49 The employee (light) vehicles trips presented at Table 12.7 do not therefore represent the expected public transport modal share, or the potential for car sharing.

12.7.50 Table 3 of the FTP (TA Appendix 1) sets out the modal shift targets for employees of the proposed development. The modal share targets have been extracted from the FTP and are given at Table 12.8.

Table 12.8: Modal share targets

Mode	Baseline	Year 3 interim target	Year 5 target
SOV	92%	85%	74%
Car share	5%	7%	12%
Public transport	3%	6%	10%
Walking & cycling	0%	2%	4%

12.7.51 Table 12.9 summarises the resulting off-site vehicle trip generation taking into account the above SOV modal share target for employees.

Table 12.9: Off-site vehicle trips (two-way) accounting for the Travel Plan (5 Year Target)

Period	Light Vehicles	HGVs	Total
AM Peak Hour	620	269	889
PM Peak Hour	828	268	1,096
Daily	9,871	4,245	14,116

12.7.52 The resulted expected two-way person trips (combined arrival and departure) by transport mode based on the 5 year FTP targets are summarised at Table 12.10. HGV trips are not subject to modal share targets as the purpose of a HGV movement is the transportation of its cargo. Therefore, HGV driver trips are assumed not to undergo modal shift

Table 12.10: Two-way person trip by mode accounting for the Travel Plan (5 Year Target)

Period	AM	PM	Daily
SOV	620	828	9,871
Car share	101	135	1,609
Public Transport	84	113	1,341
Walking & Cycling	34	45	536

12.7.53 Notwithstanding the above, the Transport Working Group requested that the assessment of the vehicle impacts be undertaken using the vehicle trip generation without considering the effect of the FTP or PTS. The assessment of the traffic impact of the Proposed Development is therefore robust as it does not include for the required 20% reduction in employee journeys to and from work that is the target identified in the FTP. With the PTS and Travel Plan operational, trip generation would be reduced in comparison to the worst-case scenario assessed, and the residual traffic impacts would also be reduced.

Impact on Highway Network Operation

12.7.54 The impact on the transport network of the Proposed Development traffic given at Table 12.7, along with the effects of existing traffic reassignment associated with the highway mitigation works is examined in detail at Chapters 7 to 10 of the TA.

12.7.55 The NSTM2 strategic modelling demonstrates that the proposed highway mitigation works remove existing congestion 'bottlenecks' on the highway network, particularly at M1 Junction 15 and 15A, and on the A508 through Road. Therefore, existing traffic is forecast to reassign to use the principal and SRN, with increases in traffic forecast on the A508 between the A5 and M1 Junction 15, and at M1 Junction 15 and 15A.

- 12.7.56 This is a desirable outcome as the A508 is an important primary route, part of NCC's road freight network and has been identified in the DfT consultation as part of the proposed Major Road Network. The strategic transport modelling demonstrates that without intervention the 2031 D1 Reference Case background traffic growth on sections of the A508 would be restricted to 1% and 5% in the morning and evening peak hour periods. This falls far short of the average 25% growth in background traffic that is forecast for the 2031 D1 Reference Case for the Northamptonshire area. The constraints on the A508 mean that the surrounding local roads would be required to accommodate a greater proportion of traffic growth in the 2031 D1 Reference Case. The highway mitigation proposals release existing constraints that allow the A508 to accommodate additional traffic and function as intended. This leads to a consequential reduction in traffic on many of the local roads and villages surrounding the SRFI, including the A508 Northampton Road and High Street through Roade; Blisworth Road/Courteenhall Road, Towcester Road, High Street, Northampton Road, and Chapel Lane in Blisworth, Rectory Lane in Milton Malsor, and Wootton Road through Quinton as shown at Figures 8.9 and 8.10 of the TA.
- 12.7.57 The impact of the increased traffic on the A508 is examined at Chapters 7, 8 and 10 of the TA, where it is shown that the A508, with the proposed highway mitigation works, would satisfactorily accommodate the changes in traffic flows.
- 12.7.58 The proposed alteration of the A508/Blisworth (Courteenhall) Road simple priority-controlled T-junction to become a left-in, left-out only junction, would remove a significant (5 minute) evening peak hour delay for drivers travelling southbound on the A508. The proposed junction would also deter the drivers from 'rat running' between the A508 and the A43 through Blisworth, which is a concern of residents. Blisworth residents and those wishing to access Blisworth/Courteenhall Road from the north via the A508 could instead use Roade Bypass and the new roundabout junction on Knock Lane, although an alternative route via Northampton Road would also be available for those travelling from Northampton.
- 12.7.59 The proposed A508 Roade Bypass leads to forecast traffic reductions through Roade of around 74% and 52% in the morning and evening peak hours and around 60% throughout the day. This would alleviate congestion within the village and at study area junctions 24, 25 and 26. The NSTM2 strategic modelling demonstrates that existing HGV traffic would choose to use the new bypass rather than travel through the village. However, this would be enforced through the proposed 7.5T environmental weight restriction through the village and on the other local roads to the south of the SRFI site, which along with the existing 7.5T environmental weight restriction that is in place on C85 Pury Road would restrict HGVs to using the A508.
- 12.7.60 The proposed alteration of A508/C26 Rookery Lane/C26 Ashton Road staggered crossroads junction to provide a single lane dualling arrangement, would improve the operation of the junction, allowing vehicles turning right to safely wait out of the path of traffic on the A508, whilst enabling drivers turning right out of the minor roads, or going straight on, to safely make the turn in two moves, i.e. crossing during a gap in traffic from the right and then turning or crossing during a gap in traffic from the left. The operation and capacity of the junction would be improved. A pedestrian and cycle crossing point over the A508, making use of the large central island, and a footway on the east side of the A508 along the frontage of the properties would also be provided. The improvements to the junction realign and soften the tight bend on the A508 to the south of the junction, thereby improving road safety at this identified accident hotspot.

- 12.7.61 Grafton Regis has an approximately 300 metres frontage along the eastern side of the A508. The traffic impact on Grafton Regis is examined at Chapter 8 of the TA. To the south of the Grafton Regis the morning and evening peak hours, and daily traffic flows on the A508 are forecast to increase by 23%, 15%, and 18% respectively. These increases are all below the threshold that would trigger further detailed assessment. Traffic that is forecast to avoid the A508 due to congestion in the 2031 D1 Reference Case, is shown to be attracted back to the A508 because the proposed A508 Road Bypass and A508 corridor route upgrade makes the A508 a more attractive route choice for drivers compared to travelling on the surrounding local roads and villages. This is reflected by forecast traffic reductions of -70%, -59% and -65% in the AM and PM peak hour and during the day, on Church Lane through the village in the 2031 J1d Development Case scenario. However, this traffic reassigns to use the A508 to the north of Church Lane and therefore traffic flows on the A508 to the north of the Church Lane are higher. The morning and evening peak hours, and daily traffic flows on the A508 to the north of Church Lane are therefore forecast to increase by some 57%, 29%, and 43% respectively.
- 12.7.62 There are no link or junction capacity constraints identified on this section of the A508 adjacent to the village. Therefore, whilst there would be large increases in traffic flows using the short section of the A508 that has frontage with the village, traffic would be free flowing, subject to the 30mph speed limit, and would be off-set by traffic reductions through other parts of the village. The residents of Grafton Regis would also benefit from the improved journey times and journey reliability associated with the proposed highway works.
- 12.7.63 Nevertheless, the additional traffic would increase the severance associated with crossing the road to access the bus stop and footpath on the western side of the A508. The development proposals therefore include the provision of a new pedestrian crossing with a central refuge on the A508.
- 12.7.64 The widening on the A508 to accommodate the pedestrian refuge provides the opportunity to provide a right turn harbourage facility for Church Lane, allowing vehicles turning right to safely wait out of the path of traffic on the A508. The new refuge will provide a channelling effect for through traffic on the A508, reinforcing the village setting and 30mph speed limit through the village.
- 12.7.65 The results of the VISSIM micro-simulation modelling are presented at Chapter 10 of the TA and at the VISSIM1 and VISSIM2 Technical Notes provided at TA Appendices 27 and 28. The micro-simulation modelling demonstrate that the proposed M1 Junction 15 and A45 major upgrade and the M1 Junction 15A improvements would provide a significant improvement to the operation of the highway network compared to the 2031 D1 Reference Case.
- 12.7.66 Tables 12.11 and 12.12 summarise the changes in average vehicle speeds and average delay per vehicle, taken from the VISSIM micro-simulation modelling results for the 2031 J1d Development Case compared to the 2031 D1 Reference Case. This demonstrates the beneficial impact of the proposed M1 Junction 15 and A45 major upgrade, and M1 Junction 15A improvement works on the operation of the highway network. The results show that with the development operational and the proposed highway works in place, average vehicle speeds would increase by 6% in the morning peak hour and by 47% in the evening peak hour. The average delay per vehicle would reduce by 40% in the morning peak hour and 69% in the evening peak hour.

Table 12.11: Average vehicle speed

Period	2031 D1 Ref Case	2031 J1d Dev Case	% Change
AM Peak Hour	35 mph	37mph	+6%
PM Peak Hour	27 mph	39 mph	+47%

Table 12.12: Average delay per vehicle

Period	2031 D1 Ref Case	2031 J1d Dev Case	% Change
AM Peak Hour	141 seconds	84 seconds	-40%
PM Peak Hour	249 seconds	76 seconds	-69%

12.7.67 The number of unreleased vehicles in a VISSIM model also provides a good indication of congestion within a highway network. In the 2031 D1 Reference Case model there were approximately 800 unreleased vehicles in the morning peak period and approximately 1800 unreleased vehicles in the evening peak period. The 2031 J1d Development Case model results shows that all vehicles were successfully released into the network in both the morning and evening peak periods, further indicating that network performance is significantly improved with the development and mitigation proposals in place.

12.7.68 Excluding development traffic, in the 2031 J1d Development Case an additional 1,511 vehicles are present in the VISSIM model in the morning peak hour and additional 2,118 vehicles are present in the VISSIM model in the evening peak, when compared to the 2031 D1 Reference Case. This additional traffic is being drawn into the SRN and principal road network because of the highway improvements. The above improvements in average speed and average delay per vehicle include for both this additional background traffic and the additional development traffic.

12.7.69 Overall, journey times for car drivers and HGV drivers would reduce and these are summarised at Table 12.13. A full assessment for each journey is provided at Tables 5 to 8 of the VISSIM1 report (TA Appendix 26).

Table 12.13: Change in of average journey between 2031 D1 Reference Case and 2031 J1d Development Case

Period	Change in average journey time per car	Change in average journey time per HGV
AM Peak Hour	-27%	-37%
PM Peak Hour	-48%	-55%

12.7.70 The positive impact of the proposed mitigation schemes at M1Junction 15 and M1 Junction 15A are particularly evident when considering the journey time comparisons on routes from the A508 (all routes), M1 South (to A43 & A5123), A45 (all routes) and the M1 North (to A43 and A5123), where the journey times are reduced by around 60% in the morning peak period and by up 90% in the evening peak period when compared to the 2031 D1 Reference Case scenario.

- 12.7.71 There are three routes in the morning peak hour and two routes in the evening peak hour where journey times see a notable increase. These are from Saxon Avenue to the A45 and from Watering Lane to the A45 in both peak hours, and from Saxon Avenue to Watering Lane in the morning peak hour. Increases of 30% to 40% in journey times are forecast in the morning peak hour and increases of up to 47% are forecast in the evening peak hour.
- 12.7.72 These increases are a result of vehicles having to negotiate the larger M1 Junction 15 layout and because the improvements signalise both the Saxon Avenue and Watering Lane approaches, which adds some delay to these routes. However, when considering the overall traffic volumes, the number of vehicles undertaking these movements is low in comparison to the majority of the other routes at 2.2% in the morning peak hour and 1.1% in the evening peak hour. Further queue lengths on Saxon Avenue would not be significant and would be expected to clear in each traffic signal cycle
- 12.7.73 Section 12.4 of this ES Chapter noted that M1 Junction 15 is often heavily congested with peak time queueing on the A45 and A508 approaches to the junction common place. Chapter 10 of the TA and Appendix F of VISSIM1 report (TA Appendix 26), present that forecast queueing at M1 Junction 15 in the 2031 D1 Reference Case and 2031 J1d Development Case.
- 12.7.74 During the morning peak hour average queue lengths on the A45 approach to M1 Junction 15 are forecast to reduce from around 2.5km in the 2031 D1 Reference Case to around 475 metres in the 2031 J1d Development Case. Queues on the A508 approach are forecast to reduce from around 1.5km in the 2031 D1 Reference Case to around 15 metres in the 2031 J1d Development Case.
- 12.7.75 During the evening peak hour queue lengths on the A45 approach to M1 Junction 15 are forecast to reduce from around 2.4km in the 2031 D1 Reference Case to around 65 metres in the 2031 J1d Development Case. Queues on the A508 approach are forecast to reduce from around 100 metres in the 2031 D1 Reference Case to around 25 metres in the 2031 J1d Development Case.
- 12.7.76 These significant reductions in queueing are a direct result of the improved capacity and operation of M1 Junction 15 and A45 that would be realised as part of the major upgrade works. The improvements would lead to the forecast savings in journey time when travelling northbound and southbound between the A508 and A45 that are shown in Table 12.14 and 12.15. These are key movements associated with traffic travelling to and from the SRFI development, which would also improve journey times for the proposed bus service and existing X4 and X7 bus services that would also serve the development.

Table 12.12: Change in journey times A508 to A45 and A45 to A508 - Cars

Period	Journey	Journey time (hrs:mins:secs)		
		2031 Ref Case	2031 Dev Case	Saving (% change)
AM	NB (A508 to A45)	00:09:16	00:03:41	-00:05:35 (-60%)
	SB (A45 to A508)	00:05:36	00:04:16	-00:01:20 (-24%)
PM	NB (A508 to A45)	00:04:29	00:03:36	-00:00:54 (-20%)
	SB (A45 to A508)	00:06:04	00:03:22	-00:02:43 (-45%)

Table 12.13: Change in journey times A508 to A45 and A45 to A508 - HGVs

Period	Journey	Journey time (hrs:mins:secs)		
		2031 Ref Case	2031 Dev Case	Saving (% change)
AM	NB (A508 to A45)	00:09:30	00:03:53	-00:05:37 (-59%)
	SB (A45 to A508)	00:05:47	00:04:33	-00:01:14 (-21%)
PM	NB (A508 to A45)	00:04:46	00:03:50	-00:00:56 (-20%)
	SB (A45 to A508)	00:06:11	00:03:29	-00:02:42 (-44%)

- 12.7.77 As discussed in Chapter 10 of the TA, the VISSIM modelling forecasts that in the 2031(D1) Reference Case queuing at M1 Junction 15 on the M1 southbound diverge would reach back beyond the end of the slip road in the morning peak hour, where it would impact on the M1 mainline flow.
- 12.7.78 The VISSIM modelling demonstrates that in the 2031 (J1d) Development Case scenario, with the M1 Junction 15 and A45 major upgrade in place, queue lengths would be comfortably stored on the slip road and would not impact on the M1 mainline. This represents a significant operational and safety improvement in the performance of M1 Junction 15 and its interaction with the M1 mainline.
- 12.7.79 At M1 Junction 15A, queuing on the slip roads in the 2031 (D1) Reference Case is forecast to exceed the length of the slip road on both the northbound and southbound diverges from the motorway in both the morning and evening peak hours. Reference Case queues on the northbound diverge would extend to some 3km in the morning peak hour and 5km in the evening peak hour. For the southbound diverge, queues of some 2km and 3.75km are forecast in the 2031 Reference in the morning and evening peak hour, respectively. These are significant queues and would impact on the M1 mainline flow.
- 12.7.80 The VISSIM modelling demonstrates that in the 2031 (J1d) Development Case scenario, with the M1 Junction 15A improvements in place, queue lengths would be comfortably stored on the slip road and would not impact on the M1 mainline. This represents a significant operational and safety improvement in the performance of M1 Junction 15A and its interaction with the M1 mainline.
- 12.7.81 Chapter 8 of the TA and TN10, TN10A and TN11 (TA Appendices 15, 16 and 17) examine the residual highway impacts at the study area junctions.
- 12.7.82 North of the A45 Barnes Meadow Interchange no significant increases in traffic flows on the A45 in the Development Case scenarios are forecast as compared to the Reference Case scenarios. However, analysis included within TN10 shows that development traffic is present on this section of the A45, and therefore local background traffic is reassigning away from this route. This reassignment occurs because north of the Barnes Meadow Interchange the link capacity of the A45 is forecast to be exceeded at several locations in both the DfT Circular 02/2013 compliant Reference Case and 2031 Reference Case scenarios. This is due to the forecast growth in background traffic, including that associated with the committed and planned development in Northamptonshire, and is therefore an existing problem with or without the addition of the development traffic. The displaced traffic reassigns across multiple routes and disperses across the road network.

- 12.7.83 Detailed models were constructed and used to assess the impact of the development traffic and the reassigned traffic on the effected study area junctions which includes all relevant junction on the A45, the A5076 Mere Way/Danes Camp Way corridor, the key junctions on the Inner Ring Road and junctions north of M1 Junction 15A.
- 12.7.84 The junction modelling demonstrates that there would not be a severe impact at any of the study area junctions when considering the practical reserve capacity for the junctions and total delay. However, when considering the junctions in more detail, localised impacts were identified at the following locations:
- the A5076 Mere Way approach to the A45 Queen Eleanor Interchange;
 - the Mere Way approach to the A5076 Danes Camp Way/Mere Way/Towcester Road gyratory; and
 - the A5123 approach to the A5076 Danes Camp way/A5123 Upton Valley Way/A5075 Upton Way gyratory
- 12.7.85 NCC required that improvement schemes be provided at these locations to mitigate the impact of the development and traffic reassignment effects. Appropriate highway improvement schemes are therefore identified and presented in the TA for these junctions.
- 12.7.86 NCC are developing a comprehensive improvement scheme at the A45 Queen Eleanor Interchange and it is recognised that flexibility regarding the timing and scope of the improvement works on the A5076 Danes Camp Way corridor would be beneficial. Therefore, it is agreed with NCC that the development would provide a financial contribution equivalent to the cost of implementing the proposed improvement works at these junctions, to be used to deliver the proposed improvements, or as part of a wider package of improvements at the A45 Queen Eleanor Interchange and the A5076 corridor to be delivered by NCC.
- 12.7.87 The results of the micro-simulation modelling in combination with the detailed junction assessment work, based on the outputs from the strategic modelling, demonstrate the suitability of the proposed highway mitigation works to accommodate the traffic increases associated with the Proposed Development.
- 12.7.88 Overall, it is concluded that the proposed highway mitigation works are required to provide satisfactory access to the Proposed Development and to accommodate the traffic reassignment effects resulting from both the development traffic and proposed highway mitigation works. The highway works also release constraints on the A508, and at M1 Junction 15 and Junction 15A, allowing the existing highway network to function in a safer and more efficient manner. This in turn draws traffic back onto the existing principal and SRN. In doing so traffic flows on many of the surrounding local roads and villages would reduce, as compared to the Reference Case. Therefore, the residual effects of the Proposed Development and highway mitigation works in general traffic impact terms can be summarised as a **permanent beneficial** impact of **major significance**.

Impact on Pedestrians, Cyclists, Equestrians (NMUs) and the community

- 12.7.89 The Proposed Development and associated highway mitigation works would alter conditions for NMUs using the public rights of way that cross the main site and those crossing the proposed Roade Bypass. The proposed highway mitigation works would also alter the existing highway infrastructure. The changes are described at Chapter 4 of the TA and Section 12.6 of this ES.
- 12.7.90 The proposals would alter the journey length and local travel patterns in the area. These changes are described in detail in the WCHAR Assessment and Review Reports, which are Appendices 18 and 19 of the TA.

- 12.7.91 PRowS KX17 and KX13 that cross the main site would be diverted and extended to form a loop around the main site within the landscape bunding. KX17 would be increased by some 800 metres (68%) and KX13 by some 180 metres (13%).
- 12.7.92 The Roade Bypass would affect public footpaths KZ30, KZ19, KZ2a and RZ3, and bridleway KZ10/RZ1. At each location, the impact of the Bypass proposals has been assessed. Suitable crossings points are provided for each of the footpaths and an underpass suitable for equestrians is provided for the bridleway.
- 12.7.93 Therefore, although journey lengths for some PRow would be longer, suitable alternative routes that minimise the impact are proposed.
- 12.7.94 Amenity is mainly influenced by the volume and types of traffic on an adjacent road link. The effect of the Proposed Development and associated highway mitigation works would be to increase traffic flows, including HGVs, on the A508 between the A5 and M1 Junction 15, including Grafton Regis, and on the SRN at M1 Junction 15 and M1 Junction 15A, on the A45. There would also be a large percentage increase in cars using Knock Lane, predominantly due to background traffic switching from Stoke Road, although actual traffic volumes would remain low.
- 12.7.95 A result of traffic being drawn onto the A508 and SRN is that traffic flows would reduce on many of the surrounding local roads, including Stoke Road, Blisworth (Courteenhall) Road, Towcester Road, Northampton Road, Collingtree Road, the unnamed road between the A508 and Quinton, Wootton Road, Church Lane in Grafton Regis, and through Ashton and Roade.
- 12.7.96 The proposed HGV routing strategy for the SRFI and the proposed 7.5T environmental weight restrictions will restrict HGV access to only suitable routes, and the A508 Roade Bypass will significantly reduce the volume of traffic passing through the village.
- 12.7.97 Overall there would be improved pedestrian and cyclist routes and connectivity. The facilities at M1 Junction 15 would be improved and traffic signal controlled crossings provided at all crossing points. A new cycle track (also for use by pedestrians) linking the A508 with the traffic free bridge over the M1 would be provide, connecting with High Street in Collingtree.
- 12.7.98 The development would provide a new cycle path alongside the A508 from Roade to M1 Junction 15 and it would provide a missing piece of cycle network adjacent to the A45 between M1 Junction 15 and Watering Lane. A shared footway/cycleway would also be provided on the eastern side of the proposed Roade Bypass, with a new footway and at grade crossing over the A508 provided at the A508/C26 Rookery Lane/C26 Ashton Road junction. The new pedestrian refuge provided on the A508 in Grafton Regis would reduce severance associated with accessing the northbound bus stop and footway.
- 12.7.99 In addition to transport and accessibility related effects, these elements of the Proposed Development coupled with the on-site routes for walking (and running) or cycling would support public health promotion and well-being agendas, and could have positive health benefits for local residents and employees.
- 12.7.100 Overall, with regards to impacts on pedestrians, cyclists, equestrians and the community it is concluded that the development proposals would have **permanent adverse** impact of **minor significance** on amenity, and a **negligible** impact on severance and on journey length and local travel patterns.

Impact on Vehicle Travellers – Driver Stress

- 12.7.101 Driver stress has three main components: frustration, fear of potential accidents, and uncertainty relating to the route being followed.

- 12.7.102 Frustration is caused by a driver's inability to drive at a speed consistent with his or her own wishes in relation to the general standard of the road. It increases as speed falls. Congestion can lead to frustration creating a situation in which the driver does not feel in control, especially when he or she wishes to arrive at a destination by a certain time but is held up by traffic congestion from which the duration of the resulting delay cannot be determined.
- 12.7.103 Taken in combination the proposed highway mitigation works on the A508, including the Roade Bypass, would reduce congestion and improve journey times and journey time reliability for drivers using this route. The VISSIM micro-simulation modelling demonstrates that the proposed M1 Junction 15 and A45 major upgrade and M1 Junction 15A highway mitigation works will significantly reduce congestion on the SRN and reduce average peak hour journey times for car drivers. Average delay per vehicle is forecast to reduce by a 40% in the morning peak hour and 69% in the evening peak hour. The effect of the Proposed Development and associated highway mitigation works would therefore be a reduction in driver frustration.
- 12.7.104 The main factors leading to driver fear of potential accidents is the presence of other vehicles, inadequate sight distances and the likelihood of pedestrians, particularly children, stepping into the road. Other factors include inadequate lighting, narrow roads, roadworks and poorly maintained road surfaces. Fear is highest when speeds, flows and the proportion of HGVs are high.
- 12.7.105 The Proposed Development would increase the number of HGVs using the road network to the north of the site. The proposed highway mitigation works would alter the routing of traffic, drawing traffic onto the A508 and away from the surrounding local roads and villages. Traffic and HGV flows on the A508 and the SRN near to the site are therefore predicted to increase, which could result in a corresponding increase in driver fear on these roads.
- 12.7.106 The proposed A508 Roade Bypass and environmental weight restriction through Roade would significantly reduce A508 traffic passing through the village. Traffic and HGV flows through Roade would therefore reduce, as would traffic and HGV flows through Blisworth, on Towcester Road and on Blisworth (Courteenhall) Road. This would lead to a reduction in driver fear on these roads and through Roade and Blisworth.
- 12.7.107 The NSMT2 forecasts one-way morning and evening peak hour traffic flow on A508 Roade Bypass of 1,297 and 1,179 vehicles (highest flows), respectively in the 2031 J1d Development Case. In accordance with Table 3 of DMRB (Volume 11, Section 3, Part 9) these flows are consistent with a high level of driver stress.
- 12.7.108 The proposed highway mitigation works at M1 Junction 15 would replace the existing give way arrangements with traffic lights for drivers entering the junction from the A508 and Saxon Avenue approaches. Drivers accessing the A45 from Watering Lane will also be provided with traffic lights. This would remove the need for drivers to judge gaps in busy traffic flows as is required under the current arrangement. Drivers will instead be provided with priority during the green traffic signal phase, thereby leading to a reduction in driver stress.
- 12.7.109 The proposed realignment and alteration to the speed limit on the A45 near M1 Junction 15 will bring traffic speeds in line with the prevailing road conditions, therefore leading to a reduction in driver fear.
- 12.7.110 Route uncertainty is caused primarily by signage that is inadequate for the individual's purposes. A strategy for directional signage has been developed for both the SRN network and the A508. These strategies are presented Section 13 of the M1 Junction 15 & A45 Improvement and M1 Junction 15A Improvement GDSR1 report for the SRN (TA Appendix 28), and at Section 13 of the A508 Route Upgrade GDSR2 report for the A508 and at (TA Appendix 29). Therefore, route uncertainty would be low.

12.7.111 It is concluded the Proposed Development and associated highway mitigation works would have a **beneficial impact of moderate significance** on driver frustration, and a **beneficial impact of minor significance** on driver fear, with a negligible impact on route uncertainty.

12.7.112 Overall, when taken together, it is concluded the Proposed Development and associated highway mitigation works would have a **permanent beneficial impact of moderate significance** on driver stress.

Impact on Vehicle Travellers – View from the Road

12.7.113 The existence of a new road may enable more people to see the landscape than before. This benefit is assessed under the heading view from the road, as is any disbenefit that may arise where a road passes through visually unattractive areas. It is defined as the extent to which travellers, including drivers, are exposed to the different types of scenery through which a route passes.

12.7.114 The Roade Bypass would provide a more rural route for drivers using the A508, who currently route through Roade village. To the east of the bypass there would be restricted views of Roade, which would generally be screened by landscaping and environmental bunding. Views to the west of the bypass would be more open, providing some limited views of the countryside. The new bridge over the WCML would provide brief views of the railway.

12.7.115 The existing intermittent views across the site from the M1, the A508, Blisworth (Courteenhall) Road, Collingtree Road and Northampton Road would be replaced with views of the Proposed Development which would be restricted via the use of new embankments and landscaping screening.

12.7.116 When taken overall, it is concluded that the proposed development and highway mitigation works would have a **negligible impact** on view from the road.

12.8 CUMULATIVE EFFECTS

12.8.1 NCC's NSTM2 includes all committed development and allocated sites within the Northamptonshire area. The model also includes the committed infrastructure schemes and those highly likely to come forward before the forecast assessment year. This includes Highways England's Smart Motorway Projects. The cumulative impacts of the development in combination with other defined land uses and infrastructures scheme has therefore been assessed as part of the overall modelling work undertaken. Full details of the committed and allocated development and infrastructure schemes included in each of the NSTM2 assessment scenarios are detailed at TA Appendix 36.

12.8.2 There is a proposed NSIP project on an adjacent site ('Rail Central'). Although not a commitment the potential cumulative effects of that emerging proposal in addition to the Proposed Development has been undertaken using the NSTM2 and VISSIM micro-simulation based on the information available in respect of Rail Central at the time of that assessment work (December 2017).

12.8.3 This is reported on detail at Technical Note 12, which forms Appendix 12.2 of this ES. The conclusions of that report and a summary of the potential cumulative effects should both the Northampton Gateway and Rail Central scheme come forward are set out in the following sections.

- 12.8.4 It should be noted that after the conclusion of the cumulative assessment modelling work, and just prior to submission of the Northampton Gateway SRFI DCO, Rail Central released further information into the public domain regarding their proposed scheme as part of their Stage 2 Statutory Consultation which took place between 15th of March 2018 and 23rd April 2018. The information included changes to their emerging highway mitigation proposals. Therefore, where relevant, the potential implications of the changes to their emerging proposals on the conclusions of the cumulative assessment are discussed in TN12.
- 12.8.5 Importantly, it should be noted that Rail Central are yet to undertake their own VISSIM modelling at M1 Junction 15 and Junction 15A and have not yet modelled the highway mitigation strategy identified in their Stage 2 Consultation in the NSTM2. In the absence of that essential modelling, the observations drawn on cumulative impact of Northampton Gateway and Rail Central schemes should be considered as tentative. In any event, Rail Central's ongoing assessment work may lead to further changes to their highway mitigation strategy, which in turn could alter the cumulative effects. The information contained in Technical Note 12 is caveated to that extent.

Disruption Due to Construction (cumulative assessment with Rail Central)

- 12.8.6 Both the Northampton Gateway SRFI and Rail Central SRFI schemes identify the same opening year, 2021. The highway infrastructure phasing for the Northampton Gateway SRFI is described at Chapter 4 of the Northampton Gateway SRFI TA, and the disruption due to the construction of the Northampton Gateway SRFI development is described at paragraphs 12.7.1 to 12.7.27 of this ES chapter.
- 12.8.7 Rail Central have not at this time provided details of their proposed highway infrastructure phasing and therefore there is limited information on which to assess the cumulative impacts of both schemes during construction. It is presumed that the procedures and controls that are described in the Northampton Gateway SRFI CEMP with regard to the need to agree with Highways England and NCC the routing of construction traffic and the traffic management associated with the construction of the highway mitigation works would also apply to Rail Central. This would ensure that potential adverse cumulative environmental impacts that could arise during construction would be minimised.

Impact on Highway Network and Vehicle Drivers (with Rail Central)

- 12.8.8 Analysis of the NSTM2 cumulative impact assessment has been undertaken for the study area junctions identified in the Northampton Gateway TA. The assessment shows a significant increase in traffic on the A508 corridor, which is largely due to the proposed A508 Road Bypass and the proposed Northampton Gateway SRFI improvement works at M1 Junction 15 releasing existing bottlenecks and drawing traffic which would have previously used alternate routes back onto the A508.
- 12.8.9 The NSTM2 cumulative impact assessment outputs provided in TN12 also show significant traffic increases on the A43 and A5 corridors. The proposed Rail Central SRFI development accesses the highway network from the A43 and so large traffic increases would be expected on these corridors. The Northampton Gateway study area does not extend to include the A43 and A5 corridors and therefore detailed assessment of the impact of the additional Rail Central traffic at these locations has not been possible.
- 12.8.10 The analysis provided in the Northampton Gateway SRFI Transport Assessment showed that as a result of the Northampton Gateway proposed highway mitigation there would be reductions in traffic through Blisworth, Milton Malsor and Roade. The results of the NSTM2 cumulative impact assessment shows that in general there would be comparable reductions through these villages, although there is a higher westbound flow forecast along Watering Lane through Collingtree and Milton Malsor.

- 12.8.11 Therefore, the NSTM2 cumulative impact assessment demonstrates that there is generally little interaction between the A508 and A43 corridors south of the M1.
- 12.8.12 To the north of the M1, the NSTM2 cumulative impact assessment shows a large increase in the westbound flow along the A5076 Mere Way from the A45 Queen Eleanor Interchange, with further westbound traffic increases from the A45 Wootton Interchange through the residential areas of Wootton and East Hunsbury.
- 12.8.13 The Transport Assessment for the Northampton Gateway SRFI shows that traffic increases on the A5076 corridor are relatively modest when compared to the 2031 (D1) Reference Case, as development traffic north of the M1 largely stays on the A45 corridor. However, there is some reassignment of background traffic onto the A5076 Ring Road corridor. The NSTM2 cumulative impact assessment shows that when compared to the Northampton Gateway SRFI, the Rail Central SRFI would significantly increase traffic flows along the A5123, A5076 and Swan Valley Way corridors.
- 12.8.14 Therefore, due to interactions between traffic generated by both SRFI developments and reassigning background traffic, the NSTM2 cumulative impact assessment shows that the traffic increases on these routes would be more significant, especially along the A5076 Ring Road and through Wootton and East Hunsbury.
- 12.8.15 The Transport Assessment for the Northampton Gateway SRFI concludes that the modelled impact at the Wootton Interchange is a result of rat-running traffic which is avoiding the Queen Eleanor Interchange. NCC have confirmed that they plan to implement a comprehensive improvement scheme at the Queen Eleanor Interchange which could draw traffic away from the Wootton Interchange. It has been agreed with the TWG that rather than promoting an improvement at the Wootton Interchange, it would be appropriate for a financial contribution towards this comprehensive scheme to be secured as part of the Northampton Gateway SRFI development. Highways England have also confirmed this this is acceptable.
- 12.8.16 The cumulative impact assessment results show that the performance of the Wootton Interchange would deteriorate. However, it is considered that the above strategy remains valid and appropriate to address this impact in the cumulative impact scenario.
- 12.8.17 In their May 2017 publicly available highway mitigation proposals, Rail Central promoted an improvement scheme at the Queen Eleanor Interchange. This scheme has been removed from the mitigation proposals presented at their Stage 2 Statutory Consultation. It is not clear what the basis for this is. Based on the above, it is anticipated that Rail Central will need to provide a financial contribution towards the comprehensive NCC improvement scheme at this junction although no mention is made of it in the Rail Central Stage 2 Statutory Consultation material.
- 12.8.18 The cumulative impact assessment model results show that there would be impacts at the A45 Barnes Meadow Interchange, the A45 Lumbertubs Interchange and the A4500/A5076 gyratory. There are no impacts at these junctions in the Northampton Gateway only scenario. However, the draft Rail Central Transport Assessment issued for the Stage 2 Statutory Consultation shows that mitigation schemes are proposed at these junctions and it is considered that proposed Rail Central mitigation schemes at these junctions could potentially mitigate the cumulative impact.

- 12.8.19 The cumulative impact assessment results show that there would be impacts at the A5076 Danes Camp Way/Towcester Road/Tesco gyratory and at the A5123/A5076 gyratory. Highway improvement schemes are promoted at both of these junctions to mitigate the impact of the Northampton Gateway SRFI, as detailed in the Northampton Gateway Transport Assessment. It has been agreed with NCC that a financial contribution to improving the wider A5076 corridor should be made, equivalent to the cost of implementing the identified Northampton Gateway mitigation schemes. The scale of the identified schemes would be unlikely to mitigate the cumulative impact of the two SRFI developments. However, the draft Rail Central Transport Assessment issued for the Rail Central Stage 2 Statutory Consultation promotes larger mitigation schemes at these locations, due to Rail Central having a greater traffic impact than Northampton Gateway at these junctions. It is considered that the identified Rail Central schemes could potentially mitigate the cumulative impact.
- 12.8.20 The detailed modelling therefore supports the conclusions of the strategic NSTM2 modelling that there is generally little interaction between the A508 and A43 corridors south of the M1, and that the addition of the Rail Central SRFI would not adversely impact upon the benefits to the A508 corridor provided by the Northampton Gateway SRFI highway mitigation strategy.
- 12.8.21 The results of the VISSIM micro-simulation modelling of M1 Junction 15 and 15A show that network performance is significantly improved in the cumulative impact scenario in comparison to the Reference Case, with the Northampton Gateway and Rail Central developments and associated junction improvements in place.
- 12.8.22 The cumulative impact assessment VISSIM results show that journey times for both cars and HGVs are reduced, with an average journey time reduction of 18% for cars and 11% for HGVs in the morning peak hour when compared to the Reference Case scenario. In the evening peak period, the journey times are reduced by 41% for cars and by 36% for HGVs.
- 12.8.23 Nonetheless, there would be some impacts in terms of queueing in the cumulative impact assessment scenario, not present in the Northampton Gateway only modelling, detailed as follows:
- In the morning peak hour the maximum queue length on the M1 northbound diverge at M1 Junction 15 is forecast to exceed the storage capacity on the slip road and could potentially impact on the M1 mainline. This is not present in the Reference Case.
 - In the morning peak hour the average queue on the M1 southbound diverge at M1 Junction 15 would reach back beyond the end of the slip road where it would impact on the M1 mainline flow. This occurs to a greater extent in the Reference Case and so would still represent an improvement.
 - Although still an improvement on the Reference Case scenario, the queue lengths on the M1 northbound diverge at M1 Junction 15A would extend back to the M1 mainline before the end of the cumulative impact assessment evening peak hour.
 - On the A43 approach to M1 Junction 15A the average and maximum queue lengths in the evening peak hour on the A43 are shown to increase significantly in the cumulative impact assessment scenario.
- 12.8.24 A revised M1 Junction 15A improvement scheme to that included in the cumulative impact VISSIM modelling was presented by Rail Central as part of their Stage 2 Statutory Consultation. This revised mitigation scheme reduces the scale of the mitigation proposals. However, it is not anticipated that the revised layout would materially change the conclusions drawn from the cumulative assessment VISSIM modelling as the alterations to the scheme do not substantially change the proposals for the M1 slip roads.
- 12.8.25 Many of the conclusions above are tentative in the absence of the final mitigation strategy for the Rail Central scheme, which is not yet available.

Impact on Pedestrians, Cyclists Equestrians and the community (with Rail Central)

- 12.8.26 There would not be any interaction between the public transport strategies for the two SRFI developments and therefore there would not be an adverse impact.
- 12.8.27 Within the Northampton Gateway SRFI site, public footpaths KX17 and KX13 that cross the main site would be diverted and extended to form a loop within the landscape bunding. To the south, a public footpath would complete the new loop arrangement linking with the existing public footpath and bridge over the West Coast Mainline railway. The emerging Rail Central proposal also includes for a footpath over the railway line with the path then tracking alongside the railway line before crossing again to the north. However, the respective strategies for PRow KX17 are incompatible.
- 12.8.28 The Rail Central Stage 2 Statutory Consultation material provides no details of the likely impacts on existing PRow KX2/LA13 south of Junction 15A, or how this route will be accommodated within the highways mitigation works that are proposed by Rail Central at M1 Junction 15A.

12.9 STATEMENT OF EFFECTS

- 12.9.1 As a result of the proposed design and highway mitigation works, the effects of the Proposed Development on the surrounding highway network will not result in any permanent moderate or major significant adverse residual effects.
- 12.9.2 The measures and procedures outlined in the Construction Management Environmental Plan will ensure that the any adverse environmental impacts during construction are minimised. Overall it is concluded that the construction phase of the development would have a **temporary adverse** impact of **moderate significance** on the operation of the surrounding highway network.
- 12.9.3 Once fully operational, the Proposed Development would remove over 92 million HGV miles per year from the highway network equating to over £50 million in monetised environmental benefits per year as calculated using the methodology set out in the Department for Transport's Guide to Mode Shift Revenue Support Scheme. The Proposed Development would provide a distribution hub, meaning that HGV journey distances would be reduced, reducing overall HGV mileage on the road network. Taken together the above modal shift and resultant reduction in overall HGV mileage represents a **permanent beneficial** impact of **major significance**.
- 12.9.4 The proposed highway mitigation works are required to provide satisfactory access to the Proposed Development and to accommodate the traffic reassignment effects resulting from both the development traffic and proposed highway mitigation works. The highway works also release constraints on the A508, and at M1 Junction 15 and Junction 15A, allowing the existing highway network to function in a safer and more efficient manner. This in turn draws traffic back onto the existing principal and SRN. In doing so traffic flows on many of the surrounding local roads and villages would reduce, as compared to the Reference Case. Therefore, the residual effects of the Proposed Development and highway mitigation works in general traffic impact terms can be summarised as a **permanent beneficial** impact of **major significance**.
- 12.9.5 With regards to impacts on pedestrians, cyclists, equestrians and the community it is concluded that the Proposal Development would have **permanent adverse** impact of **minor significance** on amenity and a **negligible** impact on severance and journey length and on local travel patterns.
- 12.9.6 It is concluded for impacts on vehicle drivers that the Proposed Development and associated highway mitigation works would have a **permanent beneficial** impact of **moderate significance** on driver stress and a **negligible** impact on view from the road.
- 12.9.7 Observations have been made regarding the cumulative impact of Northampton Gateway and Rail Central however they are tentative as Rail Central's ongoing assessment work may lead to further changes to their highway mitigation strategy, which in turn could alter the cumulative effects.