Norwich Western Link Environmental Statement Chapter 19: Traffic and Transport

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Foreword

This Traffic and Transport (T&T) Chapter has been prepared to accompany the Proposed Scheme (Norwich Western Link) planning application for a new link road scheme to the west of Norwich.

This T&T chapter of the Environmental Statement (ES) presents an assessment of the transport effects arising from the construction and operation of the Proposed Scheme. This includes an assessment of potential effects, the significance of effects, the requirements for mitigation, and the residual effects.

The assessment considers the potential effects of severance, pedestrian delay, amenity, fear and intimidation, driver delay, accidents and safety and hazardous loads.

This T&T chapter builds on the work done within the accompanying **Transport Assessment (TA)** (Document Reference: 4.01.00) which adopts a multi-modal approach to assessment and considers the Proposed Scheme with and without the accompanying set of transport mitigation measures as well as the new highway link itself.

This document should also be read in conjunction with the **Sustainable Transport Strategy (STS)** (Document Reference: 4.02.00) which explains a package of local transport improvements which can be implemented to support sustainable travel patterns within the Study Area, once through-traffic is alleviated from local minor roads with the Proposed Scheme in place.

Elements of the Proposed Scheme are defined as follows:

- Classified Road: This is the mainline of the new proposed dual carriageway within the Proposed Scheme.
- Proposed Scheme's Non-Motorised User Provision: These are the interventions in the surrounding highway network, including the provision of new public rights of way, the diversion and reclassification of existing roads and rights of way and improvements to side roads that will enhance non-motorised user provision as an integral part of the

Proposed Scheme and in relation to which planning permission is sought.

- The package of Complementary Sustainable Transport Measures (CSTM) are a range of supplementary interventions that would be brought forward in the wider west of Norwich region complementary to, but distinct from, the Proposed Scheme. The CSTM comprise two categories of measures; the cycle friendly routes described in section 7.2 of the STS and the bus strategy described in sections 7.3 and 7.4 of the STS. The cycle friendly routes would be brought forward by the Applicant within the bounds of existing highways under its highway authority powers and seek to take advantage of the reduction in traffic on local roads as a result of the operation of the Proposed Scheme to make such routes more attractive for journeys by bicycle. The bus strategy comprises the promotion of bus routes and bus stop enhancements to the west of Norwich which would be supported by the redistribution of traffic arising from the operation of the Proposed Scheme. The bus strategy would be implemented by the Applicant in partnership with bus operators. The CSTM do not form part of the Proposed Scheme but are complementary measures that would be brought forward to maximise the sustainable transport benefits flowing from the redistribution of traffic from local roads.

A pre-application public consultation for the Proposed Scheme was carried out from 15 August to 9 October 2022. Feedback from the consultation was reviewed and considered within the TA which has informed this T&T Chapter.

The traffic flows utilised for assessment within this T&T Chapter are based on the Norwich Area Transport Strategy (NATS) SATURN Model. The background traffic growth forecasting within the strategic traffic model has been updated to include the latest DfT published information from the National Trip End Model version 8.0 (NTEM 8.0) which was published in August 2022. It should be noted that the traffic model output data available at the time of the public consultation in 2022 was based

on an earlier version of the forecasting assumptions known as NTEM 7.2 which was developed in 2016.

The background traffic growth assumptions in the new NTEM 8.0 forecast includes housing and employment growth locations identified within the Greater Norwich Local Plan.

Glossary of Abbreviations and Defined Terms

The definition of key terms and abbreviations used in this report are provided below. These definitions have been developed by reference to the definitions used in EU and UK legislation and relevant guidance, as well as professional judgement based on knowledge and experience of similar schemes in the context of the Proposed Scheme.

Term	Definition
A47 TUDNHNTE	National Highways DCO A47 North Tuddenham to Easton
AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Count
CEMP	Construction Environment Management Plan
Classified Road	This is the mainline of the new proposed dual carriageway within the Proposed Scheme.
Complementary Sustainable Transport Measures	These are the package of complementary measures in the wider west of Norwich area (outside of the Proposed Scheme).
CPA	County Planning Authority
CSTM	Complementary Sustainable Transport Measures
CTMP	Construction Traffic Management Plan
DEFRA	Department of Environment, Food and Rural Affairs
DEP	Dudgeon Offshore Wind Farm Extension Project
DfT	Department for Transport

Term	Definition
DM	Do Minimum Scenario
DMRB	Design Manual for Road and Bridges
DS	Do Something Scenario
DS+Mit	Do Something Scenario with Mitigation
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESDAL	Electronic Service Delivery for Abnormal Loads
FEZ	Food Enterprise Zone
GEART	Guidelines for the Environmental Assessment of Road Traffic
GNLP	Greater Norwich Local Plan (adopted March 2024)
JCS	Joint Core Strategy
LDO	Local Development Order
LHA	Local Highway Authority
LHA	NCC as Local Highway Authority
LLG	Local Liaison Group
LTN	Local Transport Note
NATS	Norwich Area Transport Strategy Model
NCC	Norfolk County Council
NCN	National Cycle Network
NDR	A1270 Broadland Northway (previously known as Norwich Northern Distributor Road)

Term	Definition
NH	National Highways
NMU	Non-Motorised Users
NRP	Norwich Research Park
NTEM 7.2	National Trip End Model version 7.2
NTEM 8.0	National Trip End Model version 8.0
NTS	National Travel Survey
NWL	Norwich Western Link
Proposed Scheme's Non-Motorised User Provision	This is the interventions in the surrounding highway network in relation to which planning permission is sought.
SATURN Model	Highway assignment software used to create the Norwich Area Transportation Strategy Model which forms the strategic model used as the basis for this Environmental Statement.
SEP & DEP	Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Project
SRN	Strategic Road Network
STS	Sustainable Transport Strategy (Document Reference: 4.02.00)
T&T	Traffic and Transport
TA	Transport Assessment
WCHAR	Walking, Cycling and Horse Riding Assessment and Review
With mitigation Scenario	effects measured additional traffic mitigation measures north of A1067 and south of A47. These measures are explained in the TA.

Term	Definition
Without mitigation Scenario	Proposed Schemewithout additional traffic mitigation measures north of A1067 and south of A47.

19 Traffic and Transport

19.1 Introduction

19.1.1 This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Scheme on Traffic and Transport.

19.1.2 The assessment considers potential effects of the Proposed Scheme on users of the local transport network surrounding the Study Area. The Proposed Scheme is described in **Chapter 3**: **Scheme Description** (Document Reference: 3.03.00).

19.1.3 This chapter explains the methodology followed and provides a review of the existing and future baseline conditions in the vicinity of the site and surrounding area, within the scope of assessment.

19.1.4 The results of the assessment are presented by comparing the future situation with the Proposed Scheme in place; with and without mitigation against the future baseline situation without the Scheme. This forms the basis for assessing the magnitude of impacts and significance of effects on receptors having regard to their sensitivity. Relevant receptors are considered to be users of the transport network or the receiving environment surrounding the scheme.

19.1.5 Transport mitigation measures are presented and discussed within the **Transport Assessment** (**TA**) (Document Reference: 4.01.00). The assessment of link flows demonstrates the extent to which the impacts of the Proposed Scheme have been addressed during construction and operation phases. Hence only a summary of effects in ES terms is provided in this chapter.

19.2 Legislative Framework

19.2.1 This chapter has been produced in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

19.2.2 The key elements of the legislative framework is outlined in the upfront chapters of this ES:

19.3 Policy

19.3.1 This chapter in conjunction with the Transport Assessment (Document Reference: 4.01.00) has considered the following policies:

National

- National Planning Policy Framework (NPPF) 2023
- National Planning Practice Guidance (PPG, 2023)
- The DfT Circular 01 / 2022 Strategic Road Network and The Delivery Of Sustainable Development (2022);
- Cycle Infrastructure Design Local Transport Note LTN 1 / 20 (2020);
- Gear Change: A Bold Vision for Walking & Cycling (2020);
- Decarbonising Transport: A Better, Greener Britain (Department for Transport, 2021);
- National Bus Strategy – Bus Back Better (2021);
- The Clean Growth Strategy (2017);
- Climate Change Strategy 2021- 2024
- Clean Air Strategy (2019);
- Net Zero Strategy: Build Back Greener (2021);
- National Design Guide (2021);
- National Model Design Code (2021);
- Active Travel: Local Authority Toolkit (2022);
- Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (2021);

- The Second Cycling and Walking Investment Strategy (2022);
- The Strategic Road Note (SRN) 'Planning for the Future' (2015);

Local

- Norfolk County Council Local Transport Plan (LTP4) 2020 – 2037 (2022)
- Norfolk County Council Climate Strategy (2023 updated 2024)
- The Greater Norwich Local Plan (GNLP - 2024) 2018-2038
- Norfolk County Council Environmental Policy (2019)

Guidance

19.3.2 The following guidance documents have been used during the preparation of this chapter:

- The Guidelines for the Environmental Assessment of Road Traffic (GEART) published in July 2023 – by the Institute of Environmental Management and Assessment (IEMA));
- Design Manual for Road and Bridges (DMRB LA 104) (DfT 2022);
- Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021); and
- Pedestrian Comfort Guidance for London (2019) by Transport for London (TfL).

19.4 Summary

19.4.1 This section has identified policy and guidance documents relevant to the Proposed Scheme and identified key policies that may influence the scheme. These are discussed in more detail within the Transport Assessment.

19.4.2 This policy review has also identified emerging policy to ensure there is an awareness of potential policy changes affecting traffic and transport in the vicinity of the Proposed Scheme.

19.5 Consultation, Scope, Methodology and Significance Criteria

Consultation Undertaken to Date

19.5.1 **Table 19-1** provides a summary of the consultation activities undertaken in support of the preparation of this assessment.

Table 19-1 Stakeholder Engagement

Date	Activity
February 2017 - onwards	Local Liaison Group Meetings with local Parish Councils
May - July 2018	Transport Issues Public Consultation
November 2018 - January 2019	Options Public Consultation
August 2019 - onwards	Working with HE (now National Highways) for joined up delivery of the Proposed Development and A47 North Tuddenham to Easton dualling scheme
October 2019	Sustainable Transport Stakeholder Workshop 1
January 2020	Sustainable Transport Stakeholder Workshop 2
July - September 2020	Local Access Public Consultation
August 2020	Sustainable Transport Stakeholder Workshop 3 - Briefing on content of Local Access Consultation
August 2020 - onwards	Joint Local Liaison Group meetings with both NH and the Local Highway Authority (LHA)
February 2021	Local Liaison Group 23 February
March 2021	Sustainable Transport Stakeholder Workshop 4
July 2022	Active Travel England NMU strategy presentation
August - October 2022	Pre-Planning Application Public Consultation

Scope of the Assessment

19.5.2 The scope of this assessment has been established through a scoping process with statutory consultees including the Local Highway Authority and National Highways (NH). Further information can be found in **Chapter 5: Approach to EIA** (Document Reference: 3.05.00).

Extent of the Study Area

19.5.3 The relevant Study Area It is based on the links connecting to the junctions shown in **Figure 1-2** of the **TA** (Document Reference: 4.01.00). The scope of assessment was identified based on a review of the early strategic modelling results showing the area of influence in relation to significant changes in traffic flows. The junctions for assessment were agreed with the Local Highway Authority and National Highways in early stage scoping discussions. The Study Area encompasses primary road junctions on A1270 and A1067 west of A140 (including A1270 junction with A140). Also included are A47 junctions with A1174, Taverham Road / Blind Lane and Wood Lane B1535 / Berrys Lane. Secondary routes within the scope of assessment include B1535 and Longwater Lane, Taverham Lane and Costessey Lane. The rural lanes between A47 and A1067 west of A140 and east of B1535 are also considered within the scope of assessment.

19.5.4 The links connecting to the TA junctions form the scope of the local transport network to be considered within this ES chapter for vehicular movement.

19.5.5 For Non-Motorised Users, the scope of assessment is localised within a 5 kilometre radius around the Classified Road centreline consistent with the WCHAR Study Area. The same Study Area is also used for Personal Injury Accidents and highway safety as shown in **Figure 6-21** of the **TA** (Document Reference: 4.01.00).

19.6 Assessment Methodology

19.6.1 The following documents have been used to inform and guide the assessment methodology:

- The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for the Environmental Assessment of Road Traffic' (2023); and
- Design Manual for Roads and Bridges (DMRB) LA104 Environmental Assessment and Monitoring.

Assessment Process

19.6.2 The IEMA Guidelines state in paragraph 3.12 that:

"A critical feature of an environmental assessment is determining whether a given impact is significant. Having quantified the magnitude of the impact (i.e. the level of change) there are various ways of interpreting whether or not this is considered significant. […] there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources."

Impacts Assessed

19.6.3 The following types of impacts have been considered as a part of this chapter:

- Severance (pedestrian and cyclist);
- Delay (pedestrian, cyclist and drivers);
- Amenity (pedestrian and cyclist);
- Fear and Intimidation;
- Accidents and safety; and
- Hazardous / abnormal Loads.

19.6.4 The following indirect impacts will be informed by this assessment; however, they are not assessed directly as part of this chapter but are assessed in their own chapters of the Environmental Statement:

- **Chapter 6 - Air Quality**; and
- **Chapter 7 - Noise and Vibration**.

19.6.5 The future assessment years used for the above is the same as included in the Norwich Area Transportation Strategy (NATS) model and set out in the **TA** (Document Reference: 4.01.00), which are 2029 and 2044. The Transport Assessment considers an interim year of 2039 which is 10 years after opening of the Proposed Scheme.

19.6.6 The construction phase and operational phase effects of the Proposed Scheme have been assessed separately. The assessment within this T&T chapter is predominantly based on Annual Average Daily Traffic Flows, whereas the **TA** focusses on the highway peak hours.

Screening Process

19.6.7 To assist with assigning a magnitude to traffic and transport impacts, the IEMA Guidelines (**Ref 15**) sets out considerations, and in some cases thresholds, in respect to changes in the volume and composition of traffic.

19.6.8 The assessment methodology for defining the magnitude of traffic and transport impacts has been derived from IEMA Guidance (**Ref 15**) and is set out below. Where no guidance is available, commonly agreed thresholds for judging the magnitude of traffic and transport impacts and professional judgement, backed-up by data / quantified information has been applied as suggested in paragraph 3.12 of the IEMA guidance (**Ref 15**).

19.6.9 Dependent on the magnitude of impact, the effect on receptors can be beneficial or adverse or neutral if there is no change. An impact may also be classed as temporary or permanent.

19.6.10 **Table 19-2** provides a summary of the criteria used for the assessment of magnitude of impacts based on IEMA Guidance (**Ref 15**). Details of each impact category is fully explained in **Appendix 1**: **Magnitude of Impact** (Document Reference: 3.19.01).

Table 19-2 - Assessment of the Magnitude of Impact

Impact	**Magnitude of Impact: Very Low**	**Magnitude of Impact: Low**	**Magnitude of Impact: Medium**	**Magnitude of Impact: High**
Severance (Ref 15 para 2.19)	Change in total traffic of > 0 and <30%	Change in total traffic of >=30 and <60%	Change in total traffic of >=60 and <90%	Change in total traffic of >90%
Delay (pedestrian, cyclist) (Ref 16 Table 3.11)	Change in total traffic > 0 and <4,000	Change in total traffic >4,000 and <=8,000	Change in total traffic >8,000 and <=16,000	Change in total traffic > 16,000
Delay (pedestrian, cyclist) (Ref 19 Table 5.1)	Change in Severance: None	Change in Severance: Slight	Change in Severance: Moderate	Change in Severance: Severe
Total Delay (pedestrian, cyclist) (Ref 19 Table 3.11)	Change in total traffic > 0 and <4,000 and no change in severance	Change in total traffic >4,000 and <=8,000 and slight change in severance	Change in total traffic >8,000 and <=16,000 and moderate change in severance	Change in total traffic > 16,000 and severe change in severance
Amenity (pedestrian and cyclist); (Ref 15 Para 3.30)	Change in two way traffic or HGV of >0 and <=100%	Change in two way traffic or HGV of >100% and <=130%	Change in two way traffic or HGV of >130% and <=160%	Change in two way traffic or HGV of >160%

Impact	**Magnitude of Impact: Very Low**	**Magnitude of Impact: Low**	**Magnitude of Impact: Medium**	**Magnitude of Impact: High**
Amenity (pedestrian and cyclist); (Ref 20 Appendix B);	Footway width>3.3m	Footway width >2.2m <= 3.3m	Footway width >2.0m <= 3.2m	Footway width >0m <= 2.0m
Amenity (pedestrian and cyclist) (Ref 4)	Two way traffic > 2,500	Two way traffic >2,501 - <=5,000	Two way traffic >5,000 - <=10,000	Two way traffic > 10,000
Total Amenity	Change in two-way traffic of >0 and <=100% and AADT two-way traffic less than 2,500 vehicles per day and footway width >3.3m	Change in two-way traffic of >100% and <=130% and AADT two-way traffic between >2501 and <=5,000 vehicles per day and footway width 2.2m to 3.3m	Change in two-way traffic of >130% and <=160% and AADT two-way traffic between >5,000 and <=10,000 and footway width 2.0m to 2.2m	Change in two-way traffic of >160% and AADT two-way traffic greater than >10,000 vehicles per day and footway width 0m to 2m

Impact	Magnitude of Impact: Very Low	Magnitude of Impact: Low	Magnitude of Impact: Medium	Magnitude of Impact: High
Fear and Intimidation (pedestrian and cyclist); (Ref 15 Table 3.1)	Degree of hazard (0): 18hour AADT +<600, HGV +<1,000, speed =>20mph	Degree of hazard (10): 18hour AADT 600-1,200, HGV 1,000-2,000, speed 20-30mph	Degree of hazard (20): 18hour AADT 1,200-1,800, HGV 2,000-3,000, speed 30-40mph	Degree of hazard (30): 18hour AADT +1,800, HGV +3,000, speed =>40mph
Fear and Intimidation (pedestrian and cyclist); (Ref 15 Table 3.2)	Levels of fear and intimidation: 0-20	Levels of fear and intimidation: 21-40	Levels of fear and intimidation: 41-70	Levels of fear and intimidation: 71+
Fear and Intimidation (pedestrian and cyclist); (Ref 15 Table 3.3)	Magnitude of impact: No step change	Magnitude of impact: One step change with <400 18 hours AADT vehicles increase and <500 HV increase in total 18hr HV flow	Magnitude of impact: One step change with >400 18 hours AADT vehicles increase and >500 HV increase in total 18hr HV flow	Two step changes in level
Driver Delay (Seconds) (Ref 15)	Average vehicle delay changes >0s and <= 20s (LOS A, B)	Average vehicle delay changes >20s and <= 30s (LOS C, D)	Average vehicle delay changes >30s and <= 60s (LOS E)	Average vehicle delay changes > 60s (LOS F)

Impact	Magnitude of Impact: Very Low	Magnitude of Impact: Low	Magnitude of Impact: Medium	Magnitude of Impact: High
Accidents and safety (Ref 15)	Qualitative assessment based on the likely impact of a change in traffic flows on road user safety (Criteria based on professional judgement)	Qualitative assessment based on the likely impact of a change in traffic flows on road user safety (Criteria based on professional judgement)	Qualitative assessment based on the likely impact of a change in traffic flows on road user safety (Criteria based on professional judgement)	Qualitative assessment based on the likely impact of a change in traffic flows on road user safety (Criteria based on professional judgement)

Hazardous / abnormal Loads

19.6.11 Hazardous / abnormal loads require specific permission from National Highways via the ESDAL (Electronic Service Delivery for Abnormal Loads) system and notification will be made for any Abnormal Loads which can be dealt with on a case by case basis. Specific notifications would be made to the CPA, Norfolk Constabulary and National Highways in advance.

19.6.12 Details of the access routing, timings and number of abnormal load movements would be discussed and agreed with the CPA as part of the final Construction Environmental Management Plan (CEMP). A specific abnormal loads assessment would be carried out by a competent contractor. However, routes to be considered on approach to site would include A47 which is a dual carriageway trunk road, A1270 which is also dual carriageway standard and A1067 which is of A Road standard. The internal haul road which forms the main alignment of the Proposed Scheme would be used for Abnormal Loads. Marl Hill Road and Ringland Lane would also be considered.

19.6.13 Where possible the internal haul roads will be used to minimise reliance on the surrounding road network for construction traffic. Appropriate Traffic

Management Measures would be in place on relevant roads to prevent conflicts with public vehicles. This may include temporary road closures on minor rural roads of short duration in accordance with the New Roads and Street Works Act 1991. This is consistent with the approach taken by other DCO applications within the local area. Co-operation agreements will be in place to manage in-combination effects with other major schemes.

19.7 Receptor Sensitivity

19.7.1 The sensitivity of receptors to traffic and transport impacts depends upon a combination of its value and susceptibility. The sensitivity of different receptors to traffic and transport effects is outlined in **Table 19-3**.

Table 19-3 Receptor Sensitivity

Receptor Sensitivity	**Receptor Type**
High	Highly sensitive receptors (e.g. hospitals, schools, nurseries, nursing homes, a high concentration of residential dwellings and facilities and amenities, areas with high tourist footfall, significant pedestrian / cycle desire lines etc.) Or No / limited separation provided by the highway environment (e.g. no footway provision / cycle provision) in an area where there are significant pedestrian / cycle desire lines.

Receptor Sensitivity	**Receptor Type**
Medium	Medium sensitive receptors (e.g. medium concentration of residential dwellings and facilities and amenities, designated pedestrian / cycle desire lines including cycle routes and public footpaths). Or No / limited separation from traffic provided by the highway environment (e.g. narrow, intermittent footway provision close to carriageway, substandard pedestrian and cycle provision) in an area where there are some pedestrian / cycle desire lines.
Low	Low sensitive receptors (e.g. small concentration of residential dwellings, facilities and amenities, few pedestrian / cycle desire lines etc) Or A highway environment that can accommodate changes in volume of traffic (e.g. adequate (i.e. to standard) footway provision / cycle provision, well separated provision from carriageway) with few pedestrian / cycle desire lines.
Very Low	No sensitive receptors (e.g., no residential dwellings, facilities and amenities and no pedestrian / desire lines etc) such as a rural area. Or A highway environment that can accommodate changes in volume of traffic (e.g. adequate (i.e. to standard) footway provision / cycle provision, well separated provision from carriageway) with no sensitive receptors (very low).

19.7.2 The sensitivity of non-motorised users for each selected link in the Study Area is listed in **Appendix 2: Link Sensitivity Assessment** (Document Reference: 3.10.02).

Accident and Safety - Non Motorised User (NMU) Sensitivity

19.7.3 For accident and safety sensitivity, the IEMA guidance recommends the review of STATS19 data (Collisions on the public highway which involve injury or death are recorded by the police on a STATS19 form and collated by the local highway authority. The data includes a wide variety of information about the collision, such as time, date, location, road conditions) to identify any emerging patterns or factors that could be exacerbated by traffic or movement generation. This should be combined with a Safe System approach which involves:

- Identifying the Study Area using historic crash data.
- Establishing a baseline road safety level for the roads within the Study Area (could be based on International Road Assessment Programme (iRAP) (**Ref 21**) Star Ratings protocols or similar tools)
- Assessing the effects of additional development traffic for all users

19.7.4 The **TA** (Document Reference: 4.01.00) identifies locations where accident clusters on the surrounding highway network have occurred in the most recent five-year period from 1 April 2017 to 26 March 2022 at key locations within the scope of the assessment area.

19.7.5 Following the above, the sensitivity criteria for NMUs (road safety) is based on a qualitative assessment of links using the iRAP (**Ref 21**) ratings combined with a review of the collision clusters to determine the road safety sensitivity of discrete areas of the highway network.

19.7.6 This assessment considers:

- Existing highway infrastructure provision (e.g., footways, cycleways, crossing facilities, visibility etc.);

- The type of users using a link (e.g., is a link likely to be used by pedestrians, cyclists, and equestrians); and
- Review of personal injury accident records (e.g., are there any accident clusters?).

19.7.7 The sensitivity of NMUs in the Study Area is based on the thresholds set out in **Table 19-4**Error! Reference source not found. adapted from the iRAP ratings.

19.7.8 The rating protocols utilises a 3-star rating (1, 2 and 5), to provide consistency across all the assessment criteria, the rating was interpolated to include 2 and 3 star ratings as shown in **Table 19-4**Error! Reference source not found. below.

Table 19-4 – Categories of Road Safety Sensitivity

Rating	Walking	Cycling	Motorcycle	Vehicles
1 Star	No Sidewalk No safe crossing 60kmh traffic	No cycle path No safe crossings Poor road surface 70kmh traffic	No motorcycle lane Undivided road Trees close to road Winding alignment 90kmh traffic	Undivided road Narrow centreline Trees close to road Winding alignment 100kmh traffic
2 Star	No sidewalk / very narrow sidewalk Street lightning No pedestrian refuge 55kmh Traffic	On-road cycle lane Good road surface Street lightning 60kmh Traffic	On-road motorcycle lane Undivided road Good road surface >5m to any roadside hazard 90kmh Traffic	Wide centreline separating oncoming vehicles >5m to any roadside hazard 100kmh Traffic

Rating	Walking	Cycling	Motorcycle	Vehicles
3 Star	Sidewalk present Street lightning Pedestrian refuge 50 kmh Traffic	On-road cycle lane Good road surface Street lightning 60kmh Traffic	On-road motorcycle lane Undivided road Good road surface >5m to any roadside hazard 90kmh Traffic	Wide centreline separating oncoming vehicles >5m to any roadside hazard 100kmh Traffic
4 Star	Sidewalk present Signalised crossing with no refuge Street lightning 45kmh Traffic	On-road cycle lane Good road surface Street lighting No raised platform for crossing 32kmh Traffic	On-road motorcycle lane Undivided road, >5m to any roadside hazard Good road surface Street lighting 85kmh Traffic	Wide centreline Separating oncoming vehicles >5m to any roadside hazard Straight alignment 100kmh Traffic
5 Star	Sidewalk present Signalised crossing with refuge Street lightning 40 kmh Traffic	Off-road dedicated cycling facility Raised platform crossing of major roads Street lighting	Dedicated separated motorcycle lane Central hatching No roadside hazards Straight alignment 80 kmh Traffic	Safety barrier separating oncoming vehicles Protection from roadside hazards Straight alignment 100kmh Traffic

Source: International Road Assessment Programme (iRAP)

19.7.9 The collision cluster data was reviewed based on the criteria set out in **Table 19-4**.

Table 19-5 – Collision Cluster Road Safety Sensitivity

Sensitivity	**Severity**
High	Clusters showing 2 or more killed (K) and or 5 or more serious injuries (SI)
Medium	Clusters showing 1 or more killed (K) and or 5 or more serious injuries (SI)
Low	Clusters showing 2 or more serious injuries (SI)
Very Low	Clusters showing 5 or more slight injuries

19.7.10 To establish the road safety sensitivity level within the Study Area, the iRAP scoring (**Table 19-4**Error! Reference source not found.) and the collision cluster scoring (**Table 19-5** were combined with the receptor sensitivity assessment (**Table 19-3**) to derive the overall receptor sensitivity attached at **Appendix 1**: **Magnitude of Impact** (Document Reference: 3.19.01)**.**

19.7.11 The route sensitivity assessment was undertaken for the Do Minimum (reference case) Scenario and compared with the Do-Something Scenarios (with road scheme and road scheme + housing scheme) to establish any changes in levels as follows:

- No Step Change Very Low
- 1 Step Change Low
- 2 Step Change Medium
- 3 Step Change High

Significance of Effects

19.7.12 The significance of the traffic and transport effect is a product of the receptors' sensitivity and magnitude of impact. The effects are classified as beneficial or adverse or neutral (if there is no change) and temporary or permanent.

19.7.13 The significance of effect on receptors for each of the environmental effects have been considered in relation to the significance matrix from Table 3.8.1 of Section 3 of DMRB LA 104 (**Ref 16**). The matrix used to establish the significance of the effect is provided in **Table 19-6** below. It should be noted that for consistency the matrix has been adjusted to align with the criteria established in calculating the magnitude of impact and receptor sensitivity.

Table 19-6 - Significance Matrix

Nature of Effect Magnitude / Probability / Reversibility	**Receptor Sensitivity / Value: High**	**Receptor Sensitivity / Value: Medium**	**Receptor Sensitivity / Value: Low**	**Receptor Sensitivity / Value: Very Low**	**Receptor Sensitivity / Value: Negligible**
High	Substantial	Substantial	Moderate	Minor	Negligible
Medium	Substantial	Moderate	Minor	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible	Negligible
Very Low	Minor	Minor	Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

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

- **Substantial effect** – where the Proposed Scheme could be expected to have a very significant effect (either positive or negative) on users of the local transport network.

- **Moderate effect** - where the Proposed Scheme could be expected to have a noticeable effect (either positive or negative) on users of the local transport network.
- **Minor effect** - where the Proposed Scheme could be expected to result in a small, barely noticeable effect (either positive or negative) on users of the local transport network.
- **Negligible** – where no discernible effect is expected as a result of the Proposed Scheme on users of the local highway network.

Assumptions and Limitations

19.7.15 Any qualitative assessment will be subject to interpretation by the assessor. However, the assessor has experience in this area and has therefore applied their knowledge and expertise to provide a robust assessment of effects. That said, this should be read in conjunction with the assumptions set out within the TA which underpins the traffic flows utilised in the assessment within this report.

19.8 Baseline Conditions

Existing Highway Network

19.8.1 The local highway network is discussed in detail in the **Chapter 6** of the **TA** (Document Reference: 4.01.00) and summarised below.

A1270 Broadland Northway

19.8.2 The A1270 Broadland Northway, formerly known as the Norwich Northern Distributor Road (NDR), was fully opened to traffic in April 2018. The route is of dual carriageway standard that covers about 19km around the north and east of Norwich, connecting the A47 junction at Postwick in the east, to the A1067 Fakenham Road in the west.

A1067 Fakenham Road

19.8.3 The A1067 a single carriageway route that connects to the A1270 Broadland Northway on the western edge of Taverham and is the main radial route

connecting Fakenham to Norwich. This is a rural road subject to a 50mph speed limit where it passes through the Red Line Boundary about 500 metres west of Attlebridge. As it continues east into central Norwich beyond A1270 it becomes more urban in character through Taverham, Drayton and Hellesdon.

Wood Lane B1535, Frans Green, Weston Green Road and Weston Hall Road

19.8.4 B1535 is a single carriageway B-Road route that connects the A47 to A1067. It comprises several components – at its southern extent, Wood Lane B1535 connects A47 to Frans Green at the southern edge of Weston Green, and then joins Sandy Lane further west and turns north west to become Weston Green Road before merging with Weston Hall Road on a broadly north-south alignment to meet A1067 at a crossroads.

Paddy's Lane, Honingham Road and Marl Hill Road

19.8.5 Paddy's Lane is a rural single carriageway north of Wood Lane B1535 running approximately north-east to south-west through the settlement of Weston Green, leading to Weston Longville. The route connects B1535 junction with Frans Green to A1067 via Honingham Road, Woodforde Close, Church Street and Marl Hill Road. The route between B1535 and A1067 is flanked with trees and pockets of residential development. It also passes All Saints Church and 'The Hall for All' village hall. Several traffic calming features such as give way chicanes are in place through the village of Weston Longville together with a 20mph speed limit. There is a single lane section with passing places north of the Hall for All to its junction with Marl Hill Road and Morton Lane. Church Street includes steep sided verges and constrained forward visibility to minimise attractiveness to through traffic.

19.8.6 This route runs broadly parallel with B1535 and connects with A1067 approximately 2.4 kilometres east of Weston Hall Road. Despite the traffic calming features already in place, this offers a considerably shorter route for onward journeys connecting with A1270 Broadland Northway in comparison with B1535. This route would remain as an available route once the A47 North Tuddenham to Easton Improvement scheme is in place.

Ringland Lane and Morton Lane

19.8.7 Ringland Lane is a rural road which follows a northwest-southeast alignment connecting Weston Longville via Marl Hill Road to Ringland (south-east). Only a small number of residential settlements are located on Ringland Lane, mainly towards the south-eastern end. Ringland Lane will remain open to all users with the Proposed Scheme in place.

The Street, Ringland

19.8.8 Ringland village, is located in the centre of the Study Area, with connections to Taverham and Costessey to the east and Weston Longville to the west. It is situated south of the River Wensum. The Street, forms Ringland's main street linking the Ringland Lane approach from the west to Ringland Road in the east. The Street has a single lane alignment with a 30mph speed limit and a bend at its midpoint. The route through the village is narrow with some tight bends and has residential properties immediately adjacent to the carriageway which constrain the available width.

Costessey Lane

19.8.9 Costessey Lane forms the southern arm of the junction between The Street and Ringland Road. It connects Ringland village to Costessey and Drayton, meeting A1067 at Drayton High Road junction with School Road and Taverham Lane. It is narrow and has tight bends along its alignment.

Ringland Road

19.8.10 Ringland Road, branches off The Street, Ringland to the east of the village, connecting Ringland to Taverham. Ringland Road south of Ringland is a two direction rural single carriageway road that branches off Costessey Lane at a T-junction heading south towards the A47. It has a general width of 4.8 metres - 5.5 metres, but is narrower in places with tall verges and tree roots constraining two-way movement.

Church Hill Lane (Weston Road)

19.8.11 Church Hill Lane (Weston Road) is a rural road subject to national speed limit to the west of Ringland that connects to Weston Green via Weston Green Road. The route passes Honingham Lane at a T-junction slightly west of the junction of Church Hill Lane (Weston Road), The Street and Field Road.

Honingham Lane

19.8.12 Honingham Lane is a single carriageway rural road orientated generally north-south. It is subject to the national speed limit and meets Telegraph Hill at a crossroads adjacent to a caravan park on the western arm of the junction. The eastern arm runs east-west between the junction with Honingham Lane and a T-junction with Ringland Road running north-south.

Taverham Road

19.8.13 Taverham Road, runs broadly parallel with Ringland Road. It has a single lane alignment and provides access from the A47 to Taverham and Ringland, except for HGVs due to its road width.

Aylsham Road

19.8.14 Aylsham Road is located north of Norwich town centre. It is a busy road, well-lit and subject to a 20mph speed limit. It follows a north to south alignment connecting the A1042 Mile Cross Lane with Woodcock Road which provides further connection to the A140 Aylsham Road (a radial route connecting the town centre and the A1042 outer ring road). It provides direct access to residential properties, businesses and school and provides informal crossing points at key locations.

A47

19.8.15 The A47 is part of the Strategic Road Network (SRN) managed and operated by National Highways. It is the main strategic route linking Norfolk to the Midlands and the North. The existing A47 intersects with the Proposed Scheme at Wood Lane B1535 / Berrys Lane crossroads at Honingham to the south, where the route is currently of single carriageway standard. However,

National Highways has been granted Development Consent Orders under the Planning Act 2008 for wider improvements to the A47 with work to include dualling the sections of North Tuddenham to Easton, Blofield to North Burlingham and Thickthorn junction with A11.

Berrys Lane

19.8.16 Berrys Lane is a rural road which is located to the west of Honingham and south of the Wood Lane B1535 with direct access onto the A47. Immediately to the south of its junction with the A47, is Dereham Road that provides Honingham village a western access to the A47.

19.8.17 Berrys Lane joins Barnham Broom Road at a crossroads approximately 1km south of its junction with the A47. Mattishall Road forms the eastern and western arms of the junction as it runs from Norwich Road to the south-east of Honingham, west towards East Tuddenham.

Barnham Broom Road, Honingham

19.8.18 Barnham Broom Road has a single carriageway north-south alignment subject to the national speed limit, it becomes Honingham Road at a T-junction to a minor access road and continues south to Barnham Broom, where it is subject to a 30mph speed limit in the centre of the village.

19.9 Public Transport

Bus

19.9.1 A review has been undertaken of the existing bus services and facilities that operate and exist in the local area, particularly at each end of the Proposed Scheme. There are bus services available throughout the Study Area, with the greatest concentrations located within the key residential areas, which reduce in the more isolated, rural zones.

19.9.2 Along the proposed route of the Classified Road or within the Red Line Boundary, there are no existing or proposed bus stops. The nearest facilities are located on Norwich Road and A1067 Fakenham Road at Attlebridge on

A1067 adjacent to its junction with The Street about 500 metres from the edge of the Red Line Boundary.

19.9.3 The nearest services are to the north-east of the Study Area on the Yellow Line, by the bus operator First Bus Norfolk, or the Excel services to Fakenham and Dereham, King's Lynn and Peterborough.

19.9.4 Norwich Bus Station is located in Norwich City Centre, off Surrey Street and Queens Road, which is managed and operated by Konectbus. A summary of the services is provided in **Table 19-7**.

19.9.5 Konectbus provide the 3 and 4 services to the west of Norwich, connecting Barnham Broom, Barford, Mattishall, East Tuddenham, Honingham, Easton and Hockering.

Table 19-7 Local Bus Services Frequency / Hour

Route and service number	Nearest bus stop	Weekday frequency (per hour)	Saturday frequency (per hour)	Sunday frequency (per hour)	Weekday hours of operation	Operator
EXCEL Peterborough, Wisbech, Kings Lynn, Swaffham, Dereham and Norwich	The Street, Hockering	1	1	1	06:53 - 22:17	First Bus
EXCEL Norwich, Dereham, Swaffham, Kings Lynn, Wisbech and Peterborough	The Street, Hockering	1	1	1	07:58 - 23:18	First Bus
X29 Fakenham, Lenwade, Taverham, Norwich	St Faith's Close, Lenwade	1	1	0	06:57 - 19:07	First Bus
X29 Norwich, Taverham, Lenwade and Fakenham	St Faith's Close, Lenwade	1	1	0	08:07 - 18:39	First Bus

Route and service number	Nearest bus stop	Weekday frequency (per hour)	Saturday frequency (per hour)	Sunday frequency (per hour)	Weekday hours of operation	Operator
3 Watton and Norwich	Cock Inn, B1108, Barford	1	1	0	07:03 - 17:08	Konectbus
3 Norwich and Watton	Cock Inn, B1108, Barford	1	1	0	07:47 - 20:40	Konectbus
4 Norwich, Dereham and Swanton Morley	Pump, East Tuddenham	1	1	0	07:53 - 19:00	Konectbus
4 Swanton Morley, Dereham and Norwich	Pump, East Tuddenham	1	1	0	06:31 - 17:36	Konectbus

Source: First Bus and Konectbus (2022)

Train

19.9.6 A review has been undertaken of the existing rail services and facilities in the local area surrounding the proposed scheme.

19.9.7 To the south-east, is Wymondham Railway Station on the Breckland Line; to the east is Norwich Railway Station, on the Wherry Line. Further services on the Bittern Line (Norwich to Cromer) and Great Eastern Mainline (Norwich to London Liverpool Street) allow for Norwich to have strong connectivity to key destinations. Norwich and Wymondham Train Stations are operated by Greater Anglia and received 4.04 million and 196,000 passengers in 2019 / 2020 respectively (Office for Rail and Road, 2021). Statistics for 2020 / 2021 have not been used as there was reduced public transport patronage due to the COVID-19 pandemic.

19.9.8 The majority of services from Wymondham are to Cambridge and Norwich, with stops to Attleborough, Thetford, Brandon, Ely and Cambridge North creating an average journey time of 1 hour 7 minutes. Greater Anglia have now included an hourly service to Stansted Airport from Norwich, following the Norwich to Cambridge route.

19.9.9 From Norwich Station, a number of key destinations can be accessed, namely to London Liverpool Street, Lowestoft, Great Yarmouth, Liverpool Lime Street and Sheringham.

19.9.10 **Table 19-8** below summarises the weekday services available from Norwich Station, operated by Greater Anglia.

Table 19-8 Weekday Direct Rail Services from Norwich Station

Destination	Calling points	Weekday Frequency	First service	Last service	Average journey time
Ipswich	Diss and Stowmarket	Half hourly	05:00	23:05	40 minutes
London Liverpool Street	Diss, Stowmarket, Ipswich, Manningtree, Colchester and Stratford	Half hourly	05:00	22:02	1 hour 45 minutes
Great Yarmouth	Brundall	Hourly	05:06	23:00	30 minutes
Lowestoft	Brundall, Brundall Gardens, Cantley, Reedham, Hadiscoe, Somerleyton and Oulton Broad	Hourly	05:36	22:40	40 minutes

Destination	Calling points	Weekday Frequency	First service	Last service	Average journey time
Cromer & Sheringham	Salhouse, Hoveton & Wroxham, Worstead, North Walsham, Gunton, Roughton Road, Cromer and West Runton	Hourly	05:10	23:05	1 hour
Ely & Cambridge	Wymondham, Attleborough, Thetford, Brandon, Ely and Cambridge North	Hourly	05:33	22:40	1 hour 20 minutes

Source: Timetable 4, Timetable 8, Timetable 9, Greater Anglia (2022)

19.10 Existing Accessibility Review

Walking

19.10.1 Walking is particularly well suited as an alternative to car trips under 25 minutes and capable of integration with all forms of transport for journeys further afield.

19.10.2 The Proposed Scheme is located in the rural area of western Norwich, and therefore has a limited existing pedestrian network and formal pedestrian facilities (i.e. footways and dedicated surfaced facilities) do not exist across the majority of the Study Area.

Isochrones have been produced to show the walking accessibility from different origins (key settlements) within the Study Area. The analysis has been used to assess accessibility, both with and without the Proposed Scheme, to see how accessibility will change as a result. For walking, a 25-minute catchment, based on an average walking speed of 80 metres / minute has been assumed, with isochrones shown in 5-minute bands.

19.10.3 Below summarises the local network to key destinations prior to the delivery of the Proposed Scheme.

- Attlebridge, pedestrians can travel into Morton Hall, Weston Longville and Upgate within 30 minutes; further travel to the east and west of the A1067 is hindered by the lack of safe pedestrian infrastructure;
- Costessey, within a 30 minute walk is New Costessey, Costessey Park, the Marriott's Way and Taverham, showing that a number of amenities are easy to access for local residents;
- Drayton, is centrally located and so a number of key settlements and amenities can be reached, including the outskirts of Costessey. Taverham, Thorpe Marriott and the outskirts Horsford and Hellesdon;
- Hockering, travel by non-motorised modes is not attractive along the A47 as there are no suitable routes and so travel is constrained to the north and south of the arterial road. Within 30 minutes Mattishall, Whitford and Hockering Heath can be reached;
- Horsford, is quite isolated and so only Drayton and the neighbouring woodland are accessible on foot within 30 minutes;

- Lenwade, is constrained to the west by the limited provision of pedestrian infrastructure along the A1067, however pedestrians can still travel to Pockthorpe, Weston, Great Witchingham;
- Mattishall, within a 30 minute walk travel can be achieved in all directions to Welbourne, the outskirts of East Tuddenham' Mattishall Burgh and Clippings Green;
- Ringland, is located towards the north portion for the Proposed Scheme and current routes would allow for pedestrians to cross the route. Ringland Hills, Taverham and the outskirts of Attlebridge, Morton Hall and Weston can be reached;
- Taverham, similar to that of Drayton, is constrained by the A1067 to the west and east and so travel is only possible to Costessey and the outskirts of Thorpe Marriott; and
- Weston Longville is located to the north-west of the Proposed Scheme, and so within a 30 minute walk, pedestrians cross the route. Within 30 minutes Morton Hall, Weston Green and the outskirts of Morton and Attlebridge.

19.10.4 In summary, walking can cover a wide area and the delivery of the Proposed Scheme can enhance the level of pedestrian use and possibly open up new routes for local residents and enthusiast to enjoy.

Cycling

19.10.5 As with walking, cycling also has the potential to be a substitute for short car trips, further facilitating sustainable travel. The Gear Change policy explains that cycling is particularly suitable for trips under five miles.

19.10.6 The Study Area encompasses a number of cycling routes and facilities, including those of the Norfolk Trails, discussed further below.

Furthermore, there are a number of local cycling groups active in the Study Area.

19.10.7 National Cycle Network Route 1 is located to the north and east of the proposed route, known as the Marriott's Way.

19.10.8 Cycling isochrones have been produced and provided within the TA to show the cycling accessibility from different origins, key settlements, within the Study Area.

19.11 Accident History

19.11.1 A review of Personal Injury Accident (PIA) data for the 5-year period between April 2017 and March 2022, at key locations within approximately 5 kilometre radius of the Classified Road centreline revealed that 227 PIAs (212 were of slight severity, 62 were of serious severity, and 3 were of fatal severity) were recorded in the Study Area.

19.11.2 The LHA define 'accident cluster' as where five or more PIAs have occurred in a 3-year period within a 50 metre radius (urban) and 100 metre radius (rural). An 'urban' area is defined as an area with a 40mph speed limit or less; a 'rural' area is where there is a speed limit of 50mph or more.

19.11.3 Based on the above criteria, the following locations within the Study Area have been identified as accident cluster locations. The accidents are presented in detail in **Table 19-9**.

Table 19-9 Accident Cluster Details

Accident Cluster	Slight Severity	Serious Severity	Fatal Severity	Number of Vehicles Involved	Number of Casualties
1 - A47 / Church Lane / Sandy Lane	5	0	0	12	8

Accident Cluster	Slight Severity	Serious Severity	Fatal Severity	Number of Vehicles Involved	Number of Casualties
2 - A47 / Church Lane / Dereham Lane	12	0	0	19	17
3 - A47 / William Frost Way / A1074 Dereham Road	9	0	0	18	14
4 - William Frost Way / Alex Moorhouse Way / Ernest Gage Avenue	5	0	0	10	5
5 - A1270 Broadland Northway / Drayton Lane / Brewery Lane	7	0	0	10	9
6 - Shortthorn Road / B1149 Holt Road	6	0	0	14	12

19.11.4 The above accident cluster sites have been reviewed and considered in the development of the Proposed Scheme. It is noted that Sites 1 and 2 will either be removed or significantly alleviated from traffic as a result of the A47 TUD dualling scheme.

19.11.5 Site 3 is to be considered as part of a separate intervention scheme for Longwater Interchange being pursued as a separate project by NCC.

19.11.6 Site 4 is not a junction within the scope of this ES T&T assessment, and it is unlikely to be significantly affected by Proposed Scheme's traffic.

19.11.7 Site 5 is currently the subject of a separate study which would provide baseline capacity enhancement by NCC regardless of the Proposed Scheme; and Site 6 is a junction already being proposed for mitigation as part of the Proposed Scheme . This junction would have right turning movements restricted. This proposal would therefore be beneficial from a highway safety point of view.

19.11.8 The above review highlights that all of the junctions identified as accident clusters, with the exception of Site 4 will either be addressed as part of the Proposed Scheme or another baseline highway scheme, so would not continue to pose a constraint on the local highway network.

19.11.9 There have also been several recent accidents at the existing A47 junctions with Wood Lane B1535 and Berrys Lane plus Taverham Road / Blind Lane and Easton and Honingham roundabouts. However, these junctions would be removed, or grade separated as part of the National Highways A47 TUD dualling works.

19.11.10 Though not considered a cluster, the access to the main construction site off Paddy's Lane recorded 2 serious accidents and one slight accident in the vicinity.

19.12 Baseline Traffic Flows

19.12.1 The LHA has completed an update of the Norwich Area Transportation Strategy Model (NATS) strategic SATURN model to a 2019 base year, which has replaced the previous 2015 base year,

following extensive surveys collected in October 2019 to validate the model outputs against observed travel conditions.

19.12.2 The baseline traffic flows have been informed by the 2019 base year flows extracted from the NATS model. This is considered to offer a robust starting point as it is based on pre-COVID traffic levels.

19.13 Future Baseline

19.13.1 The assessment considers a future baseline of 2029 and 2044. This baseline has been derived using the NATS model and stand-alone junction models.

19.13.2 The NATS model was used to produce the AADT flows for the 2029 and 2044 future years.

19.13.3 The Do Minimum future baseline forecast includes committed developments and infrastructure that are near certain or more than likely.

19.13.4 The 2029 and 2044 DM Future Baseline link flows, without Proposed Scheme are summarised in **Appendix 3: Future Baseline Link Flows** (Document Reference: 3.19.03), further detail is provided in the accompanying TA and a summary of committed development and infrastructure set out below.

19.14 Committed Developments

19.14.1 Committed developments are the major developments in close proximity, as set out in the Uncertainty Log (UL) contained within **Appendix 8** of the **Transport Assessment** (Document Reference: 4.01.08) for the NATS model 2019 update. The Uncertainty Log sets out the committed developments in the Study Area for the strategic model. The relevant Local Planning Authorities have provided input to the development of the Uncertainty Log as the project has progressed and the status of the developments included in the model have been amended to suit the most likely Scenario. The nearby significant

developments have been included in the baseline of the updated NATS model with the extent of anticipated growth at major development sites that are 'near certain' or 'more than likely' in 2029 and 2044 as listed in **Appendix 17: Cumulative Development Data** (Document Reference: 4.01.17) of the TA.

Committed Development

19.14.2 The key developments considered within the NATS model in the vicinity of the Scheme are discussed at Chapter 7 of the **TA** (Document Reference: 4.01.00) and listed below:

- Marriott's Park major housing development in Taverham;
- 1,044 dwellings at Easton;
- Broadway Enterprise Park, Cromer Road junction with A1270;
- Norwich Airport expansion;
- Norwich Research Park expansion; and
- Food Enterprise Zone (FEZ) at Easton.

Committed Infrastructure

19.14.3 Committed highway schemes considered within TA are listed below with further details provided within Chapter 7 of the **TA** (Document Reference: 4.01.00):

- A47 NHNTE Dualling Scheme
- A11 / A47 Thickthorn Junction improvements
- A47 North Burlingham to Blofield dualling scheme which also has DCO approval in place.
- Signalisation of Fir Covert Road / Beach Avenue junction and adjacent food store development which was recently constructed on site and now open to traffic.

- Schemes associated with the Transport for Norwich Strategy

19.14.4 There are also a number of other committed highway improvements which are considered as baseline schemes within the TA as they are near certain or more than likely at the time of writing but were not included in the NATS modelling for public consultation. These are as follows:

- A140 / A1270 junction improvements to add an extra arm to the northern roundabout for access to the Recycling Centre which opened in December 2020 – this would also provide access to the BEP site; and

19.14.5 Following the UKs ambitions to expand renewable energy generation in the form of offshore wind farms, there are several committed and planned projects that are being progressed within the greater Norfolk area. The projects listed below are considered in terms of construction traffic impact only (as detailed in Chapter 10 of the **TA** (Document Reference: 4.01.00)) due to the proximity of the onshore cable routes to the Proposed Scheme corridor. However, they will have very little ongoing operational impacts so have not been considered as a committed development for the Proposed Scheme's operational assessment periods. These schemes are as follows:

- The Hornsea Three (HOW 3) project by Orsted for up to 231 offshore wind turbine off the north coast of Norfolk has received DCO approval in December 2020. The planned onshore cable route between Cromer and National Grid Norwich Main Substation in Dunston, south of Norwich is proposed to intersect the Proposed Scheme corridor.

- Extensions to existing Sheringham Shoal and Dudgeon (SEP and DEP) offshore wind farm project by Equinor are planned, with the application for DCO assessment to the Planning Inspectorate accepted in October 2022 and is currently

awaiting a decision following Examination. The planned onshore cable route between Weybourne and National Grid Norwich Main Substation in Dunston, south of Norwich is proposed to intersect the Proposed Scheme corridor close to Weston Road.

19.15 Mitigation Measures (Embedded / Primary, Secondary and Tertiary)

19.15.1 A number of primary, secondary and tertiary mitigation measures have been identified through the iterative EIA process and have been incorporated into the design and construction planning of the Proposed Scheme.

19.15.2 Primary mitigation is often referred to as ‘embedded mitigation’ and includes modifications to the location or design of the development that are an inherent part of the project and a fundamental part of the design for which consent is sought.

19.15.3 Secondary mitigation measure is one that is more 'bespoke' to the proposed development and that is required to mitigate adverse significant effects. This is further discussed in Section 19.19.11 to 19.19.15.

19.15.4 Tertiary mitigation measures are legal requirements or standard practices that would be implemented as part of the Proposed Scheme. These include best practice measures, such as those that would be set out in the Construction Traffic Management Plan (CTMP), Construction Worker Travel Plan and Construction Environmental Management Plan (CEMP).

19.15.5 The assessment of likely significant effects of the Proposed Scheme assumes that these mitigation measures are in place.

19.15.6 These measures are summarised in this section so that it is clear where and why they have been included and the way in which

they have contributed to the management and reduction of environmental effects.

Primary Mitigation

19.15.7 A number of primary mitigation measures have been embedded into the design, and for the assessment, this chapter assumes that the Non-Motorised User Provisions are in place to mitigate otherwise potentially significant effects on Pedestrians, Cyclists and Equestrians in the immediate vicinity of the Classified Road. The assessment notes that these mitigation measures would require construction and implementation themselves and hence the construction traffic assessment takes into account these requirements.

19.15.8 The following primary mitigation, relevant to transport, has been embedded into the Proposed Scheme. The proposed mitigation measures are set out within the TA and summarised below:

- A Non-Motorised User Strategy has been developed and would be implemented in the immediate vicinity of the Proposed Scheme. These works consists of a network of new and enhanced Public Rights of Way (PRoW) connecting up the existing fragmented and sparse existing PRoW network around the Proposed Scheme and mitigating severance caused by the scheme with the provision of new green bridges and underpasses crossing the scheme which accessible to Non-Motorised Users. These would replace the existing routes which cross the Proposed Scheme's alignment. This is considered within all Scenarios assessed with the Proposed Scheme included (Do-Something and Do-Something plus Mitigation Scenarios)

Tertiary Mitigation

19.15.9 Some mitigation measures comprise standard management practices and are therefore included as tertiary mitigation against

which impacts are assessed. These measures are embedded processes / procedures, rather than physical design measures.

19.15.10 These include best practice measures set out in:

- Construction Environmental Management Plan – this provides information on measures to manage the impact of construction on the environment. An Outline CEMP (Document Reference: 3.03.01) is submitted with the planning application as a framework document explaining the key principles.
- At a later stage a Construction Traffic Management Plan would be produced once further detail on construction proposals is produced – this would provide information on traffic routing and hours of operation, plus mitigation measures to manage and control the traffic and transport impacts of construction traffic and abnormal loads.
- Construction Worker Travel Plan – this would set out a strategy to encourage sustainable travel by construction workers and visitors travelling to / from the Proposed Scheme.

19.16 Assessment of Environmental Effects

19.16.1 This section sets out the assessment of the transport effects arising from the construction and operation of the Proposed Scheme.

19.16.2 The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Scheme, and the sensitivity of the affected receptor / receiving environment to change. Magnitude of change and the sensitivity of the affected receptor / receiving environment are both assessed on a scale of high, medium, low and negligible.

19.16.3 Paragraph 1.27 of the IEMA guidance advise that as a general rule of thumb, environmental assessment practitioners should consider:

"the forecast changes to baseline (magnitude of change/impact), the relative value/sensitivity/importance of the affected asset/receptor and the scale, nature and significance of the effect (consequence). The EIA Regulations also require consideration of whether the anticipated effect is short-term, medium-term or long-term and whether it is permanent or temporary."

19.16.4 For transparent and systematic identification of likely significant environmental effects from the Proposed Scheme, the use of the terms 'impact' and 'effect' will follow the below definition:

- **Impacts**: changes resulting from an action; and
- **Effects**: the consequences of impacts.

19.17 Construction Phase

19.17.1 There will be a temporary increase in HGV traffic during the construction period. HGV movements will be principally associated with the delivery of plant and materials, and the removal of construction waste. In addition, construction personnel and visitors to the site will also generate car and van movements as they arrive and depart.

19.17.2 Construction of the Proposed Scheme is planned to take about 36 months from commencement. The works will be carried out in phases, with appropriate traffic management measures in place to facilitate safe construction access and protect members of the public from highway safety issues where there is increased risk of conflict.

19.17.3 As discussed in **Section 19.13**, there are several committed and planned projects that are being progressed within the greater Norfolk area. Many of them will have very little construction impact in combination with the Proposed Scheme due to proximity, construction trip generation, construction route and construction period.

19.17.4 However, the Orsted Hornsea 3 (HOW3) and the Equinor Sheringham and Dudgeon (SEP and DEP) windfarm projects are planned to be at various stages of construction at the same time as the Proposed Scheme.

19.17.5 The HOW3 scheme is already under construction in 2024 with works planned to install Horizontal Directional Drilled ducting beneath the Proposed Scheme route in spring 2024. Based on the latest available programme information, the HOW3 works proposed in the overlapping Study Area is therefore expected to be largely completed at the time of the construction phase for the Proposed Scheme in 2026. Further consideration of overlapping effects is provided in **Chapter 10** of the **TA** (Document Reference: 4.01.00).Though these schemes will have an insignificant operational impact, they have been considered in terms of construction traffic impact due to the proximity of the onshore cable routes to the Proposed Scheme.

19.17.6 The HOW3, SEP and DEP construction traffic will be routed via the A47, Ringland Lane, Marl Hill Road, the A1067 (Marl Hill Road to A1270) and the A1270 (A1067 to Fir Covert Road). These routes will be used by the Proposed Scheme construction traffic. However, due to the programme durations for the three cable schemes and geographic scope, it is unlikely that all will have their busiest construction phase occurring at the same time as each other as well as the Proposed Scheme.

19.17.7 The SEP and DEP schemes have yet to receive DCO approval as the decision has been postponed until April 2024. Hence, it is not expected that there would be an overlap with the Proposed Scheme works until 2028 - 2029 which would avoid the busy period for the Proposed Scheme which is expected to occur between March 2027 and October 2027.

19.17.8 The SEP and DEP scheme consists of two wind farm cables which will cross the route of the Proposed Scheme in the vicinity of Church Hill Lane (Weston Road). The SEP and DEP Construction Traffic information provided in **Appendix 14** of the **TA** (Document Reference: 4.01.14) offers two scenarios – with both schemes constructed simultaneously or for each individual scheme (SEP only or DEP only).

19.17.9 As a worst-case Scenario, the peak SEP and DEP combined traffic for both schemes constructed simultaneously have been considered in combination with the Proposed Scheme's busy period construction traffic to consider the cumulative effects in the event of overlapping construction works. It should be noted that the likelihood for the peaks to occur at the same time on the same route is very minimal, the in-combination assessment discussed below therefore represents a robust case.

19.17.10 As the SEP and DEP scheme is a combined scheme comprising two wind farm cables, it is assumed that the HOW3 Construction traffic would be at a lower level of magnitude if the works were to overlap with the Proposed Scheme construction phase and it is unlikely that SEP and DEP would overlap with HOW3 in the same location. Hence it is sufficient to assess only the SEP & DEP combined scheme with the Proposed Scheme in combination.

19.17.11 The geographic scope of the overlapping effects would also be confined to Marl Hill Road, Morton Lane and Ringland Lane, A1067, A1270 and A47. The HOW3 scheme also takes access via Taverham Road which is not a construction access route for the Proposed Scheme, so there would be no overlapping effects in that location.

19.17.12 At Ringland Lane, the HOW3 scheme also proposes a haul road which is coincident with that to be used for the Proposed Scheme. This is intended to minimise vehicle conflicts but the HOW3

scheme is already under construction and due to be completed in the vicinity of the Proposed Scheme prior to start of construction in 2026 for the Proposed Scheme.

Construction Traffic Routeing

19.17.13 The main internal haul road will occupy the footprint of the Proposed Scheme main carriageway south of Ringland Lane. This will connect from the A47 / Wood Lane B1535 junction to Ringland Lane, allowing materials to be delivered and moved, with minimal impact on the minor roads within the surrounding highway network. An additional construction haul road will also be provided parallel with Ringland Lane on the south side to enable a one way loop to be created to minimise conflict with opposing construction vehicle movements. .

19.17.14 The routes and access points are outlined clearly in **Figure 10-2** of the **TA** (Document Reference: 4.01.00).

19.17.15 Based on a review of potential material source locations and discussions with the Contractor, it has been assumed that for the duration of construction, the following split of construction vehicle movements will occur due to the location of internal haul roads and access to materials and construction activities:

Typical Day Scenario – is the main case with earthworks loadings at both ends so would be representative of the typical daily average but would offer a robust case looking at a combination of scenario 4 and 8 for HGVs, thus:

- Marl Hill Road sensitivity test – this scenario represents a worst case for the northern roads, Marl Hill Road / A1067 / A1270 (assuming Wood Lane B1535 / A47 junction is not available to HGVs temporarily).
- Wood Lane sensitivity test as a worst case for Wood Lane B1535 / A47 southern extent of the Study Area (assuming all earthworks materials / disposals arrive and depart from Wood Lane B1535

junction, so only the temporary elevated platform material is delivered at the north of the site via Marl Hill Road).

19.17.16 There are four proposed access points to access the main site compound, satellite welfare facilities and haul road, these are listed below and shown in **Figure 10-4** of the **TA** (Document Reference: 4.01.00).

- Direct access from A1067 close to the proposed new roundabout;
- Ringland Lane west of the Proposed Scheme (avoiding Ringland Village);
- Paddy's Lane between Breck Lane (Breck Road) and The Broadway (main site compound);
- Directly from Wood Lane B1535; and,
- Direct access from the new A47 TUD northern roundabout with Wood Lane B1535

19.17.17 The sensitivity of the links forming the routes identified above are set out in **Table 19-10** which highlights the qualification of the sensitivity of each link based on the criteria set out within **Table 19-3**.

Table 19-10 Definition of Sensitivity (Construction)

Reception / Link	**Sensitivity of Receptor**	**Qualification**
A1067 (West of Marl Hill Road)	Medium	Medium concentration of residential dwellings and facilities, with pedestrian / cycle desire lines

Reception / Link	Sensitivity of Receptor	Qualification
A1067 (East of Marl Hill Road)	Low	Small concentration of residential dwellings, some pedestrian / cycle desire lines
A1067 (site access)	Low	Small concentration of residential dwellings, some pedestrian / cycle desire lines
Marl Hill Road>Ringland Lane (site access)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.
Ringland Lane (Haul Road) (site access)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.
Wood Lane B1535>Paddy's Lane (site access)	Low	Small concentration of residential dwellings and industrial units some pedestrian / cycle desire lines
A47 roundabout (site access)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.
A47 (West of Wood Lane B1535)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.

Reception / Link	Sensitivity of Receptor	Qualification
A47 (East of Wood Lane B1535)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.
A1270 (A1067 to Fir Covert Road)	Very Low	No sensitive receptors - no residential dwellings, facilities and amenities and no pedestrian / desire lines.

Construction Traffic Impact Assessment

19.17.18 The magnitude of an impact is typically defined by four factors:

- Extent (area over which an effect occurs);
- Duration (time over which the effect occurs);
- Frequency (how often the effect occurs); and
- Severity (degree of change relative to existing environmental conditions).

19.17.19 The construction traffic effects have been based on the typical day construction traffic Scenario (as discussed above). The Flows for 2019 base year has been utilised for robustness (as they offer a lower base for impact magnitude).

19.17.20 The change in traffic flows based on the IEMA guidance for link selection have been set out in **Table 19-11.**

Table 19-11 Total two-way Construction Traffic and Magnitude of Impact

Link	2019 Base (All Vehicles)	Proposed Scheme	Impact
A1067 (East of Marl Hill Road)	16206	196	1%
A1067 (West of Marl Hill Road)	16206	420	3%
Marl Hill Road	2829	406	14%
Ringland lane	**279**	**203**	**73%**
Ringland lane (Haul Road)	0	203	0%
Paddy's Lane	2829	170	6%
Wood Lane B1535	2829	170	6%
A47 from Wood Lane to Taverham Road	24851	126	1%
A47 from Blind Lane to Dereham Road	24700	126	1%
A47 from Dereham Road to A1074	35039	126	0%
A47 (West of Wood Lane B1535)	24851	126	1%
A1270 from A1067 to Fir Covert Road	8183	420	5%

19.17.21 Based on the traffic flows outlined in **Table 19-11**, it is evident that the effects of the construction traffic movements on the strategic 'A' roads are generally less than the typical daily variation of traffic (+ / - 5%), so would not be noticeable to other road users.

19.17.22 **Table 19-11** shows that Ringland Lane has the highest magnitude of impacts, resulting in a 73% magnitude of impact.

19.17.23 Ringland Lane has a very low base flow, hence the large percentage uplift with the construction traffic added. That said the route has a rural character with no properties adjacent to the road.

The two-way flows with both schemes under construction would be less than 1000 vehicles / day.

19.17.24 Construction traffic routeing as discussed above is mainly via A and B roads which have very low sensitivity. The local roads used to access the sites have only a small concentration of settlements with little or no walking or cycling desire lines, or destinations that attract NMU trips, thus the sensitivity of receptors on the identified routes to driver delay, pedestrian and cyclist delay, severance, amenity and fear and intimidation (as set out in **Table 19-10**) is very low to medium.

Construction Traffic Effects

19.17.25 The significance of effect based on the sensitivity of the construction route (set out in **Table 19-10**) and the magnitude of construction traffic effect (set out in **Table 19-11**) is outlined in **Table 19-12.**

19.17.26 The assessment of construction traffic effect based the links scoped in for assessment (flows above 30%) has been based on Ringland Lane where the highest impacts are expected, however Marl Hill Road has also been assessed. The full assessment of the remaining links is shown in **Appendix 4: In-Combination Assessment** (Document Reference: 3.19.04) based on the construction traffic typical day scenario. The results show a temporary negligible to minor effect which is not significant, on driver delay, pedestrian and cyclist delay, amenity and fear and intimidation on all links which is not significant.

19.17.27 Sensitivity Test for Scenarios 4 and 8 as worst-case construction traffic via the north and south were also considered. The results were not different from the main case and have been included in **Appendix 4: In-Combination Assessment** (Document Reference: 3.19.04).

19.17.28 The conversion of Low Farm from a residential dwelling to Office use has been considered and would not have any construction effects as there are no significant construction works proposed to the building. However, the operational effects of the existing use are proposed to be replaced with commuting and business trips for up to 5 employees. As a result of the change of use to office use, the number of total vehicle movements at Back Lane per day will be similar to the existing use of Low Farm (with about 5-6 vehicles accessing the site per day on average) but the make up of traffic would have a higher LGV and HGV component. Further information is provided about the proposed change of use at Low Farm in the chapter 3 of the Transport Assessment (Document Reference 4.01.00). However, the change of use of an individual residential dwelling would not normally require an environmental assessment, so this aspect of the Proposed Scheme is scoped out of the ES from a transport perspective.

19.17.29 Enabling works for the Proposed Scheme will also take access via Back Lane, Ringland. Typical vehicle movements for this are listed in Appendix 12 of the TA (Document Reference 4.01.12). This will result in around 34 LGVs and 5-6 HGVs per day so the increase in total vehicle flows will be comparable to the likely existing use of the route. However, mitigation will be provided in the form of a CEMP and the Construction Phase Travel Plan, both of which will apply during the enabling works phase.

19.17.30 Back Lane is lightly trafficked with estimated DM flows under 1,000 vehicles a day. As set out in Section 19.18, DM flows under 1,000 AADT are scoped out due to the low level of flow, and as such further assessment of effects on Fear and Intimidation, Severance and NMU Amenity effects during construction are therefore scoped out for Back Lane.

19.17.31 In relation to accidents and safety, it is acknowledged that the access route is adjacent to residential properties and constrained with

width restrictions and there are no footways, so the access route is sensitive. Back Lane is also a public right of way (part of Ringland Footpath FP3 and FP1) so is used by Non-Motorised Users. Despite this, flows of 34 LGVs and 5-6 HGV vehicles per day is a low number of movements per day in absolute terms. The impact would also be short term during the enabling works phase of the Proposed Scheme and temporary with intermittent use similar to previous Geotech intrusive site surveys which have been successfully completed taking access via Back Lane, Ringland. Specific measures will be defined within the Construction Traffic Management Plan (CTMP) which will be prepared prior to construction and agreed with the Local Highway Authority. Therefore, it is anticipated that the effects on accidents and safety for local residents and NMUs can be appropriately managed so that effects would be reduced to **minor adverse**, with localised controls on site to address highway safety risks at the site access for vehicles arriving to site and departing via Back Lane, in particular to manage conflicts with Non-Motorised Users and HGVs.

Severance

19.17.32 The assessment of severance on the links screened into the assessment is summarised overleaf.

Table 19-12 Construction Traffic Effect on Severance (All Vehicles)

Link	2019 Base	NWL Flow	Base + Construction	Change in Traffic Flows	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
Marl Hill Road	2,829	406	3,235	14%	Very Low	Very Low	Negligible	**Adverse**
Ringland Lane	279	203	482	73%	Low	Medium	Minor	**Adverse**

19.17.33 As shown above Marl Hill Road is expected to see a **temporary , negligible adverse** effect on severance which is **not significant**. Ringland Lane will see a **temporary , minor adverse effect** on severance which is **not significant.**

Pedestrian and Cycle Amenity

19.17.34 The complete assessment of amenity during the construction phase is set out below.

Table 19-13 Construction Traffic Effect on Pedestrian and Cycle Amenity

Street Name	2019 Base	NWL Flow	Base + Construction	Footway Width (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
Marl Hill Road	2,829	406	3,235	0	High	Very Low	Low	Very Low	Negligible	Adverse
Ringland lane	279	203	482	0	High	Low	Medium	Very Low	Minor	Adverse

19.17.35 As shown above Marl Hill Road is expected to see a **temporary, negligible adverse** effect on Pedestrian and Cycle Amenity which is **not significant**. Ringland Lane will see a **temporary, minor adverse effect** on Pedestrian and Cycle Amenity which is **not significant.**

Pedestrian and Cycle Delay

19.17.36 The assessment of pedestrian and cycle delay during the construction phase is set out below.

Table 19-14 Change in Traffic Flow / Day (DMRB LA112 Table 3.11)

Street Name	Base Flows	NWL Construction Flows	Base + NWL Construction	Change in Traffic Flow	Change in Base Traffic Flow + Construction	Magnitude Step Change in Flow
Marl Hill Road	2,829	406	3,235	Very Low	Very Low	Very Low
Ringland lane	279	203	482	Very Low	Very Low	Very Low

Table 19-15 Change in Severance (TAG Unit A4.1 Table 5.1)

Street Name	Severance	Construction Severance	Step Change in Severance	Combined Magnitude of Change (Severance + Flow)	Receptor Sensitivity	Effect Significance	Effect Polarity
Marl Hill Road	Low	Low	Very Low	Very Low	Very Low	Negligible	Adverse
Ringland lane	Low	Low	Very Low	Very Low	Low	Negligible	Adverse

19.17.37 As shown above, Marl Hill Road is expected to see a **temporary, negligible adverse** effect on Pedestrian and Cycle Delay which is **not significant**. Ringland Lane will see a **temporary, negligible adverse effect** on Pedestrian and Cycle Delay which is **not significant.**

Fear and Intimidation

19.17.38 The assessment of fear and intimidation during the construction phase is set out below with further details set out within **Appendix A**.

Table 19-16 Level of Fear and Intimidation Degree of Hazard – Base Flows

Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
Marl Hill Road	262	0	28	0	0	10	+10	Small
Ringland lane	11	0	25	0	0	10	+10	Small

Table 19-17 Level of Fear and Intimidation Degree of Hazard – Base Flows + Construction Traffic

Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
Marl Hill Road	285	366	28	0	0	10	+10	Small
Ringland Lane	22	183	25	0	0	10	+10	Small

19.17.39 The assessments above demonstrate that with the base flows on Marl Hill Road and Ringland Lane, they see a small level of fear and intimidation.

19.17.40 The magnitude of change assessed above has been combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation. The assessment is as follows.

Table 19-18 Fear and Intimidation Magnitude of Change and Significance of Effect 2029 DS1- (without mitigation)

Street Name	Base Flow Level of F&I	Base Flow + NWL Level of F&I	Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
Marl Hill Road	Small	Small	0	<400	<500	Negligible	Very Low	Negligible	Adverse
Ringland Lane	Small	Small	0	<400	<500	Negligible	Low	Negligible	Adverse

19.17.1 As shown above, Marl Hill Road and Ringland Lane are expected to see a **temporary , negligible adverse** effect on Fear and Intimidation which is **not significant**.

Accident and Road Safety

19.17.2 The approach used for assessing the effects on accident and road safety is summarised in **Section 19.6.**

19.17.3 For Accident and Road Safety, all links within the Study Area were assessed. All links are expected to see a **permanent negligible** effect on accident and road safety which is **not significant**.

19.17.4 The full assessment of all the links is provided within in **Appendix 4: In-Combination Assessment** (Document Reference: 3.19.04).

19.18 Operation Phase

Traffic Link Screening

19.18.1 The link screening has been based on the Norwich Area Transport Strategy (NATS) SATURN Model which was updated to a 2019 base year with comprehensive surveys across Norwich. The NATS model shows how traffic will be likely to re-route and alter existing journey patterns to access the Proposed Scheme.

19.18.2 The traffic and transport effects of the Proposed Scheme has been established by comparing the following Scenarios:

- **Scenario 1** Do-Minimum (**DM**): 2029 and 2044 without the Proposed Scheme
- **Scenario 2** Do-Something (**DS1**): 2029 and 2044 with the Proposed Scheme.
- **Scenario 3** Do-Something (**DS2**): 2029 and 2044 with the Proposed Scheme + mitigation.

19.18.3 The Do Something and Do Something with mitigation Scenarios have been compared with a Do Minimum Scenario that is based on the most likely future situation that is expected for the surrounding highway network without the Proposed Scheme in place. The Do Minimum

baseline forecast includes committed developments that are near certain or more than likely.

19.18.4 The Do Something with mitigation Scenario includes the Proposed Scheme and off-site transport mitigation proposals as part of the scheme, including the closure of Honingham Lane.

19.18.5 The mitigation package considered is set out within the TA and is consistent with the proposals presented during the summer 2022 public consultation.

19.18.6 The links within the Study Area have been screened to identify those scoped in for assessment in line with the IEMA guidelines. The screening process is based on the percentage change in traffic and sensitivity of receptors along a link.

19.18.7 The traffic link screening for each selected link in the Study Area has been undertaken by applying (flows increase more than 30%) and 2 (flows increase more than 10% in sensitive areas) of the screening process to the AADT traffic flows. In addition, DM flows under 1,000 vehicles a day have been scoped out given the low base flows.

19.18.8 **Appendix 6: Traffic link Screening** (Document Reference: 3.19.06) summarises the traffic link screening for each link in the Study Area by applying rule 1 and 2 of the screening process to the AADT.

19.18.9 Applying the rules above, the links that have been scoped in have been assessed for the without and with mitigation Scenarios (Scenario 1-2 and 1-3) respectively, thus; **Table 19-19** and **Table 19-20** (Scenario 1 and 2) and **Table 19-21** and **Table 19-22**(Scenario 1 and 3) for each assessment year.

Table 19-19 Link Screening 2029 (Without Mitigation)

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS1-DM (%)
14	Brick Kiln Road	B1149	Low	1030	1460	42%
16	Shortthorn Road	B1149 & Serpentine Lane	Medium	3360	5580	66%
18	Bell Road	Mill Road & Norwich Road	High	1000	1330	33%
108	Burgh Lane	Dereham Road & Mattishall Lane	Medium	1690	2230	32%
109	South Green / Mill Street	South of Norwich Road	High	1980	2360	19%
117	The Common	East of Heath Road	High	4540	4410	-3%
140	A47	Taverham Road & Dereham Road	Very Low	1410	2070	47%
165	Old Fakenham Road	Fakenham Road & Station Road	High	1660	2810	69%
228	Taverham Road	The Street & Reepham Road	High	3240	7040	117%
230	The Street, Felthorpe	Mill Lane & Bilney Lane	High	3900	7240	86%
248	A1270	Fakenham Road & Fir Covert Rd	Very Low	11990	29900	149%

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS1-DM (%)
254	A1270	Reepham Road & Drayton Lane	Very Low	21950	29230	33%

Table 19-20 Link Screening 2044 (Without Mitigation)

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS1-DM (%)
16	Shortthorn Road	B1149 & Serpentine Lane	Medium	3890	6170	59%
18	Bell Road	Mill Road & Norwich Road	High	1130	1920	70%
24	Low Road	Hospital Lane	Medium	7710	8200	6%
92	Mattishall Road	Norwich Road & Barnham Broom Road	Low	1920	2840	48%
108	Burgh Lane	Dereham Road & Mattishall Lane	Medium	1890	2460	30%
109	South Green / Mill Street	South of Norwich Road	High	2390	2730	14%
117	The Common	East of Heath Road	High	4940	4850	-2%
118	Heath Road	The Common & Blind Lane	Medium	4940	4850	-2%
165	Old Fakenham Road	Fakenham Road & Station Road	High	1510	3040	101%

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS1-DM (%)
228	Taverham Road	The Street & Reepham Road	High	4510	8140	80%
230	The Street, Felthorpe	Mill Lane & Bilney Lane	High	5120	8340	63%
248	A1270	Fakenham Road & Fir Covert Rd	Very Low	16010	39460	146%
254	A1270	Reepham Road & Drayton Lane	very Low	27920	36470	31%

19.18.10 The assessment shows that with the Proposed Scheme in place, the network sees some traffic redistribution with additional traffic using the local roads (scoped in above) to access the Proposed Scheme .

19.18.11 Based on the individual link assessments, the following links in 2029 without mitigation are expected to see the highest magnitude of impact, with more than 100% change in traffic:

- Taverham Road (between The Street and Reepham Road)
- A1270 (between Fakenham Road and Fir Covert Road)

19.18.12 The following links in 2044 without mitigation are expected to see the highest magnitude of impact, with more than 100% change in traffic:

- Old Fakenham Road (between Fakenham Road & Station Road)
- A1270 (between Fakenham Road and Fir Covert Road)

19.18.13 It is worth noting that though links 117 and 118 have less than 30% change in traffic, they are scooped in because they are in a high

sensitivity area with more than 10% change in HGV flows as shown in **Appendix 5: Traffic link screening** (Document Reference: 3.19.05).

19.18.14 The effect of the mitigation proposed to alleviate the anticipated magnitude of impact on the links is summarised in **Table 19-21** and **Table 19-22**.

Table 19-21 Link Screening - 2029 (With Mitigation)

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS-DM (%)
14	Brick Kiln Road	B1149	Low	1030	1260	22%
16	Shortthorn Road	B1149 & Serpentine Lane	Medium	3360	1220	-64%
18	Bell Road	Mill Road & Norwich Road	High	1000	1050	5%
108	Burgh Lane	Dereham Road & Mattishall Lane	Medium	1690	2340	38%
109	South Green / Mill Street	South of Norwich Road	High	1980	2570	30%
117	The Common	East of Heath Road	High	4540	4440	-2%
140	A47	Taverham Road & Dereham Road	Very Low	1410	1990	41%
165	Old Fakenham Road	Fakenham Road & Station Road	High	1660	1120	-33%
228	Taverham Road	The Street & Reepham Road	High	3240	3190	-2%

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS-DM (%)
230	The Street, Felthorpe	Mill Lane & Bilney Lane	High	3900	3010	-23%
248	A1270	Fakenham Road & Fir Covert Rd	Very Low	11990	29570	147%
254	A1270	Reepham Road & Drayton Lane	very Low	21950	32110	46%

Table 19-22 Link Screening - 2044 (With Mitigation)

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS-DM (%)
16	Shortthorn Road	B1149 & Serpentine Lane	Medium	3890	1450	-63%
18	Bell Road	Mill Road & Norwich Road	High	1130	1190	5%
24	Low Road	Hospital Lane	Medium	7710	8000	4%
92	Mattishall Road	Norwich Road & Barnham Broom Road	Low	1920	2190	14%
108	Burgh Lane	Dereham Road & Mattishall Lane	Medium	1890	2580	37%
109	South Green / Mill Street	South of Norwich Road	High	2390	3000	26%
117	The Common	East of Heath Road	High	4940	4900	-1%
118	Heath Road	The Common & Blind Lane	Medium	4940	4900	-1%

Link ID	Street Name	Junctions or Between	Receptor Sensitivity	AADT DM	AADT DS	DS-DM (%)
165	Old Fakenham Road	Fakenham Road & Station Road	High	1510	1120	-26%
228	Taverham Road	The Street & Reepham Road	High	4510	4350	-4%
230	The Street, Felthorpe	Mill Lane & Bilney Lane	High	5120	4160	-19%
248	A1270	Fakenham Road & Fir Covert Rd	Very Low	16010	39660	148%
254	A1270	Reepham Road & Drayton Lane	Very Low	27920	40040	43%

19.18.15 As demonstrated in **Table 19-22**, in 2029 the proposed mitigation results in traffic flow reduction below 30% on most links except:

- Burgh Lane (between Dereham Road & Mattishall Lane)
- A47 (between Taverham Road and Dereham Road)
- A1270 (Fakenham Road and Fir Covert Road)

19.18.16 In 2044, the proposed mitigation results in traffic flow reduction below 30% on most links except:

- Burgh Lane (between Dereham Road & Mattishall Lane)
- A1270 (Fakenham Road and Fir Covert Road)

19.18.17 It is worth noting that whilst traffic flow increases on Burgh Lane exceed 30%, the link flows remain very close to 2500 total vehicles per day, which in line with LTN / 120 is suitable for most cycle trips.

19.18.18 The A1270 is also considered to be suitable for tolerating the anticipated increase as it is designed to carry heavy traffic.

19.18.19 The effects of these changes in flows on the links scoped in for assessment is set out below. The full assessment of links is shown in **Appendix 8: Assessment of Operational Effects** (Document Reference: 3.19.08).

19.18.20 As previously stated, some links have less than 30% change in traffic but have been scoped in as they are in a high sensitivity area with more than 10% change in HGV flows as shown in **Appendix 5: Traffic link screening** (Document Reference: 3.19.05).

Severance

Scenario 1 and 2 (Without Mitigation)

19.18.21 The approach used for assessing the effects on severance is summarised in Section 19.4. IEMA guidance (**Ref. 15**) suggests that changes in traffic flow of 30%, 60% and 90% would be low, medium and high magnitude of impact on severance, respectively.

19.18.22 The assessment of severance on all links is summarised below.

19.18.23 The following abbreviations are used within the below tables: DM – Do Minimum, DS1 – Do Something (no mitigation), DS1-DM – Do Something minus Do Minimum.

Table 19-23 Severance – 2029 (Without Mitigation)

Link ID	Street Name	DM	DS1	DS1-DM (%)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
14	Brick Kiln Road	1,030	1,460	42%	Low	Low	Minor	**Adverse**
16	Shortthorn Road	3,360	5,580	66%	Medium	Medium	**Moderate**	**Adverse**
18	Bell Road	1,000	1,330	33%	High	Low	**Moderate**	**Adverse**
108	Burgh Lane	1,690	2,230	32%	Medium	Low	Minor	**Adverse**
109	South Green / Mill Street	1,980	2,360	19%	High	Very Low	Minor	**Adverse**
117	The Common	4,540	4,410	-3%	High	Very Low	Minor	Beneficial
140	A47	1,410	2,070	47%	Very Low	Low	Negligible	**Adverse**
165	Old Fakenham Road	1,660	2,810	69%	High	Medium	**Substantial**	**Adverse**
228	Taverham Road	3,240	7,040	117%	High	High	**Substantial**	**Adverse**
230	The Street, Felthorpe	3,900	7,240	86%	High	Medium	**Substantial**	**Adverse**
248	A1270	1,1990	29,900	149%	Very Low	High	Minor	**Adverse**
254	A1270	21,950	29,230	33%	Very Low	Low	Negligible	**Adverse**

Table 19-24 Severance – 2044 (Without Mitigation)

Link ID	Street Name	DM	DS1	DS1-DM (%)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Significance
16	Shortthorn Road	3,890	6,170	59%	Medium	Low	Minor	**Adverse**
18	Bell Road	1,130	1,920	70%	High	Medium	**Substantial**	**Adverse**
24	Low Road	7,710	8,200	6%	Medium	Very Low	Minor	**Adverse**
92	Mattishall Road	1,920	2,840	48%	Low	Low	Minor	**Adverse**
108	Burgh Lane	1,890	2,460	30%	Medium	Low	Minor	**Adverse**
109	South Green / Mill Street	2,390	2,730	14%	High	Very Low	Minor	**Adverse**
117	The Common	4,940	4,850	-2%	High	Very Low	Minor	Beneficial
118	Heath Road	4,940	4,850	-2%	Medium	Very Low	Minor	Beneficial
165	Old Fakenham Road	1,510	3,040	101%	High	High	**Substantial**	**Adverse**
228	Taverham Road	4,510	8,140	80%	High	Medium	**Substantial**	**Adverse**
230	The Street, Felthorpe	5,120	8,340	63%	High	Medium	**Substantial**	**Adverse**
248	A1270	16,010	39,460	146%	Very Low	High	Minor	**Adverse**
254	A1270	27,920	36,470	31%	Very Low	Low	Negligible	**Adverse**

19.18.24 The assessment shows that in 2029 with the Proposed Scheme in place, Old Fakenham Rd, Taverham Road and The Street (Felthorpe) are expected to see the highest magnitude of change resulting in a **permanent, substantial, adverse** effect which is **significant.**

19.18.25 Bell Road with high sensitivity and low magnitude of change will see a permanent, moderate, adverse effect which is significant. Likewise, Shortthorn Road with a moderate sensitivity and moderate magnitude of change will see a **permanent, moderate, adverse** effect which is **significant**.

19.18.26 The remaining links are expected to see additional flows resulting in a **permanent, minor, adverse** effect on severance which is **not significant**.

19.18.27 In 2044, with the Proposed Scheme in place, Old Fakenham Rd, Taverham Road, The Street, Felthorpe are expected to continue to see the highest magnitude of change as well as Bell Road resulting in a **permanent, substantial, adverse** effect which is **significant**.

19.18.28 The remaining links are expected to see additional flows resulting in a **permanent, minor, adverse effect** on severance which is **not significant**.

Scenario 1 & 3 (With Mitigation)

19.18.29 Following the proposed mitigation, the effect of traffic on severance is set out within the tables below.

Table 19-25 Severance - 2029 (With Mitigation)

Link ID	Street Name	DM	DS2	DS2-DM (%)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
14	Brick Kiln Road	1,030	1,260	22%	Low	Very Low	Negligible	**Adverse**
16	Shortthorn Road	3,360	1,220	-64%	Medium	Medium	**Moderate**	Beneficial
18	Bell Road	1,000	1,050	5%	High	Very Low	Minor	**Adverse**
108	Burgh Lane	1,690	2,340	38%	Medium	Low	Minor	**Adverse**
109	South Green / Mill Street	1,980	2,570	30%	High	Very Low	Minor	**Adverse**
117	The Common	4,540	4,440	-2%	High	Very Low	Minor	Beneficial
140	A47	1,410	1,990	41%	Very Low	Low	Negligible	**Adverse**
165	Old Fakenham Road	1,660	1,120	-33%	High	Low	**Moderate**	Beneficial
228	Taverham Road	3,240	3,190	-2%	High	Very Low	Minor	Beneficial
230	The Street, Felthorpe	3,900	3,010	-23%	High	Very Low	Minor	Beneficial
248	A1270	1,1990	29,570	147%	Very Low	High	Minor	**Adverse**
254	A1270	2,1950	3,2110	46%	Very Low	Very Low	Negligible	**Adverse**

Table 19-26 Severance – 2044 (With Mitigation)

Link ID	Street Name	DM	DS2	DS2-DM (%)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Significance
16	Shortthorn Road	3,890	1,450	-63%	Medium	Medium	**Moderate**	Beneficial
18	Bell Road	1,130	1,190	5%	High	Very Low	Minor	**Adverse**
24	Low Road	7,710	8,000	4%	Medium	Very Low	Minor	**Adverse**
92	Mattishall Road	1,920	2,190	14%	Low	Very Low	Negligible	**Adverse**
108	Burgh Lane	1,890	2,580	37%	Medium	Low	Minor	**Adverse**
109	South Green / Mill Street	2,390	3,000	26%	High	Very Low	Minor	**Adverse**
117	The Common	4,940	4,900	-1%	High	Very Low	Minor	Beneficial
118	Heath Road	4,940	4,900	-1%	Medium	Very Low	Minor	Beneficial
165	Old Fakenham Road	1,510	1,120	-26%	High	Very Low	Minor	Beneficial
228	Taverham Road	4,510	4,350	-4%	High	Very Low	Minor	Beneficial
230	The Street, Felthorpe	5,120	4,160	-19%	High	Very Low	Minor	Beneficial
248	A1270	1,6010	39,660	148%	Very Low	High	Minor	**Adverse**
254	A1270	27,920	40,040	43%	Very Low	Very Low	Negligible	**Adverse**

19.18.30 **Table 19-25** and **Table 19-26** shows that all other links would experience a **permanent negligible** to **minor adverse / beneficial** effect on severance which is **not significant**.

19.18.31 Old Fakenham Road and Shorthorn Road are expected to see a **permanent moderate beneficial** effect which is **significant**.

Pedestrian and Cycle Delay

Scenario 1 & 2 (Without Mitigation)

19.18.32 The approach used for assessing the effects on pedestrian and cycle delay is summarised in **Appendix 1**: **Magnitude of Impact** (Document Reference: 3.19.00). IEMA (**Ref 15**) recommended threshold based on Table 3.11 of DMRB LA112 (**Ref 16**) traffic flow thresholds and TAG Unit A4.1 (**Ref 19**) Table 5.1 (Change in Severance) as set out in **Section 19.6**.

19.18.33 The magnitude of change has been calculated based on the changes in severance ratings between the DM and DS Scenarios based on TAG Unit A4.1 Table 5.1, combined with changes in traffic flows based on thresholds set out in Table 3.1 of DMRB LA112.

19.18.34 The complete assessment of pedestrian and cycle delay on all links for the assessment year 2029 is set out in the tables below.

Table 19-27 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) – 2029 (Without Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS1)	Traffic Flow DM	Change in Traffic Flow DS1	Magnitude Step Change in Traffic_DM-DS1
14	Brick Kiln Road	1,030	1,460	Very Low	Very Low	Very Low
16	Shortthorn Road	3,360	5,580	Very Low	Very Low	Low
18	Bell Road	1,000	1,330	Very Low	Very Low	Very Low
108	Burgh Lane	1,690	2,230	Very Low	Very Low	Very Low
109	South Green / Mill Street	1,980	2,360	Very Low	Very Low	Very Low
117	The Common	4,540	4,410	Low	Low	Low
140	A47	1,410	2,070	Very Low	Very Low	Very Low
165	Old Fakenham Road 0	1,660	2,810	Very Low	Very Low	Very Low
228	Taverham Road	3,240	7,040	Very Low	Very Low	Low
230	The Street, Felthorpe	3,900	7,240	Very Low	Very Low	Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	1,1990	29,900	Medium	Medium	High
254	A1270 (Reepham Rd & Drayton Ln)	21,950	29,230	High	High	High

Table 19-28 Change in Severance (TAG Unit A4.1 Table 5.1) – 2029 (Without Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS1 Severance (with Road Scheme)	Magnitude Step Change in Severance (DM-DS1)
14	Brick Kiln Road	Low	Low	Very Low
16	Shortthorn Road	Medium	Medium	Very Low
18	Bell Road	Low	Medium	Very Low
108	Burgh Lane	Low	Medium	Very Low
109	South Green / Mill Street	Low	Medium	Very Low
117	The Common	Low	Low	Very Low
140	A47	High	High	Very Low
165	Old Fakenham Road 0	Low	Medium	Very Low
228	Taverham Road	Low	Medium	Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Low
254	A1270 (Reepham Rd & Drayton Ln)	High	High	Low

19.18.35 The step change between the DM and DS cases for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-29**.

Table 19-29 Pedestrian and Cycle Delay - Significance of Effect – 2029 (Without Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Road	Very Low	Very Low	Very Low	Low	Negligible	**Adverse**
16	Shortthorn Road	Low	Very Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
140	A47	Very Low	Very Low	Very Low	Very Low	Negligible	**Adverse**
165	Old Fakenham Road	Very Low	Low	Very Low	High	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
228	Taverham Road	Low	Low	Low	High	Moderate	Beneficial
230	The Street, Felthorpe	Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	Very Low	Negligible	**Adverse**

19.18.36 The assessment in **Table 19-29** shows that all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay which **not significant**.

19.18.37 Taverham Road is expected to see **moderate beneficial** effects which is **significant**.

19.18.38 The complete assessment of pedestrian and cycle delay on all links for the assessment year 2044 is set out in the tables below.

Table 19-30 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) – 2044 (Without Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS1)	Traffic Flow DM	Traffic Flow DS1	Magnitude Step Change in Traffic_DM-DS1
16	Shortthorn Road	3,890	6,170	Very Low	Very Low	Low
18	Bell Road	1,130	1,920	Very Low	Very Low	Very Low
24	Low Road	7,710	8,200	Low	Low	Low
92	Mattishall Road	1,920	2,840	Very Low	Very Low	Very Low
108	Burgh Lane	1,890	2,460	Very Low	Very Low	Very Low
109	South Green / Mill Street	2,390	,2730	Very Low	Very Low	Very Low
117	The Common	4,940	4,850	Low	Low	Low
118	Heath Road	4,940	4,850	Low	Low	Low
165	Old Fakenham Road	1,510	3,040	Very Low	Very Low	Very Low
228	Taverham Road	4,510	8,140	Low	Low	Low
230	The Street, Felthorpe	5,120	8,340	Low	Low	Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	1,6010	3,9460	High	High	High
254	A1270 (Reepham Rd & Drayton Ln)	2,7920	3,6470	High	High	High

Table 19-31 Change in Severance (TAG Unit A4.1 Table 5.1) 2029 (Without Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS1 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS1)
16	Shortthorn Road	Medium	Medium	Very Low
18	Bell Road	Low	Medium	Low
24	Low Road	Low	Medium	Low
92	Mattishall Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
118	Heath Road	High	High	Very Low
165	Old Fakenham Road	Low	Medium	Low
228	Taverham Road	Low	Medium	Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	high	Very Low

19.18.39 The step change between the DM and DS1 case for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-32.**

Table 19-32 Pedestrian and Cycle Delay - Significance of Effect – 2044 (Without Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Low	Very Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
24	Low Road	Low	Low	Low	Medium	Minor	**Adverse**
92	Mattishall Road	Very Low	Low	Very Low	Low	Negligible	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
118	Heath Road	Low	Very Low	Very Low	Medium	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
165	Old Fakenham Road	Very Low	Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Low	Low	Low	High	**Moderate**	Beneficial
230	The Street, Felthorpe	Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.40 The assessment in **Table 19-32** shows that all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay is not significant.

19.18.41 Taverham Road is expected to continue to see a **moderate beneficial** effect which is **significant**.

Scenario 1 & 3 (With Mitigation)

19.18.42 The assessment overleaf shows the traffic effect on pedestrian and cycle delay following mitigation.

Table 19-33 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) – 2029 (With Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS2)	Traffic Flow DM	Change in Traffic Flow DS2	Magnitude Step Change in Traffic_DM-DS3
14	Brick Kiln Road	1,030	1,260	Very Low	Very Low	Very Low
16	Shortthorn Road	3,360	1,220	Very Low	Low	Very Low
18	Bell Road	1,000	1,050	Very Low	Very Low	Very Low
108	Burgh Lane	1,690	2,340	Very Low	Very Low	Very Low
109	South Green / Mill Street	1,980	2,570	Very Low	Very Low	Very Low
117	The Common	4,540	4,440	Low	Low	Low
140	A47	1,410	1,990	Very Low	Very Low	Very Low
165	Old Fakenham Road 0	1,660	1,120	Very Low	Very Low	Very Low
228	Taverham Road	3,240	3,190	Very Low	Low	Very Low
230	The Street, Felthorpe	3,900	3,010	Very Low	Low	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	11,990	2,9570	Medium	High	High
254	A1270 (Reepham Rd & Drayton Ln)	21,950	3,2110	High	High	High

Table 19-34 Change in Severance (TAG Unit A4.1 Table 5.1) 2029 (With Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS2 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS2)
14	Brick Kiln Road	Low	Low	Very Low
16	Shortthorn Road	Medium	Low	Low
18	Bell Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
140	A47	High	High	Very Low
165	Old Fakenham Road 0	Low	Low	Very Low
228	Taverham Road	Low	Low	Very Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	High	Very Low

19.18.43 The step change between the DM and DS cases for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-35**.

Table 19-35 Pedestrian and Cycle Delay - Significance of Effect – 2029 (With Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM - DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Road	Very Low	Very Low	Very Low	Low	Negligible	**Adverse**
16	Shortthorn Road	Very Low	Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
140	A47	Very Low	Very Low	Very Low	Very Low	Negligible	**Adverse**
165	Old Fakenham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
230	The Street, Felthorpe	Very Low	Very Low	Very Low	High	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM - DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.44 The assessment in **Table 19-35** shows that all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay.

19.18.45 The complete assessment of pedestrian and cycle delay on all links for the assessment year 2044 is set out in the tables below.

Table 19-36 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) 2044 (With Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS2)	Traffic Flow DM	Traffic Flow DS2	Magnitude Step Change in Traffic_DM-DS2
16	Shortthorn Road	3,890	1,450	Very Low	Low	Very Low
18	Bell Road	1,130	1,190	Very Low	Very Low	Very Low
24	Low Road	7,710	8,000	Low	Medium	Low
92	Mattishall Road	1,920	2,190	Very Low	Very Low	Very Low
108	Burgh Lane	1,890	2,580	Very Low	Very Low	Very Low
109	South Green / Mill Street	2,390	3,000	Very Low	Very Low	Very Low
117	The Common	4,940	4,900	Low	Low	Low
118	Heath Road	4,940	4,900	Low	Low	Low
165	Old Fakenham Road	1,510	1,120	Very Low	Very Low	Very Low
228	Taverham Road	4,510	4,350	Low	Medium	Very Low
230	The Street, Felthorpe	5,120	4,160	Low	Medium	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	1,6010	39,660	High	High	High
254	A1270 (Reepham Rd & Drayton Ln)	2,7920	40,040	High	High	High

Table 19-37 Change in Severance (TAG Unit A4.1 Table 5.1) 2044 (With Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS2 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS2)
16	Shortthorn Road	Medium	Low	Low
18	Bell Road	Low	Medium	Low
24	Low Road	Low	Medium	Low
92	Mattishall Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
118	Heath Road	High	High	Very Low
165	Old Fakenham Road	Low	Low	Very Low
228	Taverham Road	Low	Low	Very Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	high	Very Low

19.18.46 The step change between the DM and DS1 case for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-38**.

Table 19-38 Pedestrian and Cycle Delay - Significance of Effect – 2044 (With Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM-DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Very Low	Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
24	Low Road	Low	Low	Low	Medium	Minor	**Adverse**
92	Mattishall Road	Very Low	Low	Very Low	Low	Negligible	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
118	Heath Road	Low	Very Low	Very Low	Medium	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM-DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
165	Old Fakenham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
230	The Street, Felthorpe	Very Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.47 The assessment in **Table 19-38** shows that in 2044 all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay which is **not significant**.

Scenario 1 & 2 (Without Mitigation)

19.18.48 The approach used for assessing the effects on pedestrian and cycle delay is summarised in **Appendix 1**: **Magnitude of Impact** (Document Reference: 3.19.01). IEMA (**Ref 15**) recommended threshold based on Table 3.11 of DMRB LA112 (**Ref 16**) traffic flow thresholds and TAG Unit A4.1 (**Ref 19**) Table 5.1 (Change in Severance) as set out in **Section 19.6**.

19.18.49 The magnitude of change has been calculated based on the changes in severance ratings between the DM and DS Scenarios based on TAG Unit A4.1 Table 5.1, combined with changes in traffic flows based on thresholds set out in Table 3.1 of DMRB LA112.

19.18.50 The assessment of pedestrian and cycle delay on all links for the assessment year 2029 is set out in the tables below.

Table 19-39 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) 2029 (Without Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS1)	Traffic Flow DM	Change in Traffic Flow DS1	Magnitude Step Change in Traffic_DM-DS1
14	Brick Kiln Road	1,030	1,460	Very Low	Very Low	Very Low
16	Shortthorn Road	3,360	5,580	Very Low	Very Low	Low
18	Bell Road	1,000	1,330	Very Low	Very Low	Very Low
108	Burgh Lane	1,690	2,230	Very Low	Very Low	Very Low
109	South Green / Mill Street	1,980	2,360	Very Low	Very Low	Very Low
117	The Common	4,540	4,410	Low	Low	Low
140	A47	1,410	2,070	Very Low	Very Low	Very Low
165	Old Fakenham Road 0	1,660	2,810	Very Low	Very Low	Very Low
228	Taverham Road	3,240	7,040	Very Low	Very Low	Low
230	The Street, Felthorpe	3,900	7,240	Very Low	Very Low	Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	1,1990	29,900	Medium	Medium	High
254	A1270 (Reepham Rd & Drayton Ln)	21,950	29,230	High	High	High

Table 19-40 Change in Severance (TAG Unit A4.1 Table 5.1) 2029 (Without Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS1 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS1)
14	Brick Kiln Road	Low	Low	Very Low
16	Shortthorn Road	Medium	Medium	Very Low
18	Bell Road	Low	Medium	Very Low
108	Burgh Lane	Low	Medium	Very Low
109	South Green / Mill Street	Low	Medium	Very Low
117	The Common	Low	Low	Very Low
140	A47	High	High	Very Low
165	Old Fakenham Road	Low	Medium	Very Low
228	Taverham Road	Low	Medium	Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Low
254	A1270 (Reepham Rd & Drayton Ln)	High	High	Low

19.18.51 The step change between the DM and DS cases for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-41**.

Table 19-41 Pedestrian and Cycle Delay - Significance of Effect – 2029 (Without Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Road	Very Low	Very Low	Very Low	Low	Negligible	Adverse
16	Shortthorn Road	Low	Very Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	Adverse
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	Adverse
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	Adverse
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
140	A47	Very Low	Very Low	Very Low	Very Low	Negligible	Adverse
165	Old Fakenham Road	Very Low	Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Low	Low	Low	High	**Moderate**	**Beneficial**
230	The Street, Felthorpe	Low	Very Low	Very Low	High	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	Adverse

19.18.52 The assessment in **Table 19-41** shows that all links would experience a **negligible to minor adverse / beneficial** effect on pedestrian and cycle delay which is **not significant**.

19.18.53 Taverham Road is expected to see **moderate beneficial** effects which is **significant**.

19.18.54 The assessment of pedestrian and cycle delay on all links for the assessment year 2044 is set out in the tables below.

Table 19-42 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) 2044 (Without Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS1)	Traffic Flow DM	Traffic Flow DS1	Magnitude Step Change in Traffic_DM-DS1
16	Shortthorn Road	3,890	6,170	Very Low	Very Low	Low
18	Bell Road	1,130	1,920	Very Low	Very Low	Very Low
24	Low Road	7,710	8,200	Low	Low	Low
92	Mattishall Road	1,920	2,840	Very Low	Very Low	Very Low
108	Burgh Lane	1,890	2,460	Very Low	Very Low	Very Low
109	South Green / Mill Street	2,390	2,730	Very Low	Very Low	Very Low
117	The Common	4,940	4,850	Low	Low	Low
118	Heath Road	4,940	4,850	Low	Low	Low
165	Old Fakenham Road	1,510	3,040	Very Low	Very Low	Very Low
228	Taverham Road	4,510	8,140	Low	Low	Low
230	The Street, Felthorpe	5,120	8,340	Low	Low	Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	16,010	39,460	High	High	High
254	A1270 (Reepham Rd & Drayton Ln)	27,920	36,470	High	High	High

Table 19-43 Change in Severance (TAG Unit A4.1 Table 5.1) 2029 (Without Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS1 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS1)
16	Shortthorn Road	Medium	Medium	Very Low
18	Bell Road	Low	Medium	Low
24	Low Road	Low	Medium	Low
92	Mattishall Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
118	Heath Road	High	High	Very Low
165	Old Fakenham Road	Low	Medium	Low
228	Taverham Road	Low	Medium	Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	high	Very Low

19.18.55 The step change between the DM and DS1 case for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-42**.

Table 19-44 Pedestrian and Cycle Delay - Significance of Effect – 2044 (Without Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Low	Very Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
24	Low Road	Low	Low	Low	Medium	Minor	**Adverse**
92	Mattishall Road	Very Low	Low	Very Low	Low	Negligible	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
118	Heath Road	Low	Very Low	Very Low	Medium	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS1	Magnitude Step Change in Severance (DM-DS1)	Combined Magnitude of Change (DM DS1)	Receptor Sensitivity	Effect Significance	Effect Polarity
165	Old Fakenham Road	Very Low	Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Low	Low	Low	High	**Moderate**	**Beneficial**
230	The Street, Felthorpe	Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.56 The assessment in **Table 19-44** shows that all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay which is not significant.

19.18.57 Taverham Road is expected to continue to see a moderate beneficial effect which is significant.

Scenario 1 & 3 (With Mitigation)

19.18.58 The assessment overleaf shows the traffic effect on pedestrian and cycle delay following mitigation.

Table 19-45 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) 2029 (With Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS2)	Traffic Flow DM	Change in Traffic Flow DS2	Magnitude Step Change in Traffic_DM-DS3
14	Brick Kiln Road	1,030	1,260	Very Low	Very Low	Very Low
16	Shortthorn Road	3,360	1,220	Very Low	Low	Very Low
18	Bell Road	1,000	1,050	Very Low	Very Low	Very Low
108	Burgh Lane	1,690	2,340	Very Low	Very Low	Very Low
109	South Green / Mill Street	1,980	2,570	Very Low	Very Low	Very Low
117	The Common	4,540	4,440	Low	Low	Low
140	A47	1,410	1,990	Very Low	Very Low	Very Low
165	Old Fakenham Road 0	1,660	1,120	Very Low	Very Low	Very Low
228	Taverham Road	3,240	3,190	Very Low	Low	Very Low
230	The Street, Felthorpe	3,900	3,010	Very Low	Low	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	11,990	29,570	Medium	High	High
254	A1270 (Reepham Rd & Drayton Ln)	21,950	32,110	High	High	High

Table 19-46 Change in Severance (TAG Unit A4.1 Table 5.1) 2029 (With Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS2 Severance (with Road Scheme)	Magnitude Step Change in Severance (DM-DS2)
14	Brick Kiln Road	Low	Low	Very Low
16	Shortthorn Road	Medium	Low	Low
18	Bell Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
140	A47	High	High	Very Low
165	Old Fakenham Road 0	Low	Low	Very Low
228	Taverham Road	Low	Low	Very Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	High	Very Low

19.18.59 The step change between the DM and DS cases for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-47**.

Table 19-47 Pedestrian and Cycle Delay - Significance of Effect – 2029 (With Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM - DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Road	Very Low	Very Low	Very Low	Low	Negligible	**Adverse**
16	Shortthorn Road	Very Low	Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
140	A47	Very Low	Very Low	Very Low	Very Low	Negligible	**Adverse**
165	Old Fakenham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM - DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
228	Taverham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
230	The Street, Felthorpe	Very Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.60 The assessment in **Table 19-47** shows that all links would experience a negligible to minor adverse / beneficial effect on pedestrian and cycle delay which is not significant.

19.18.61 The assessment of pedestrian and cycle delay on all links for the assessment year 2044 is set out in the tables below.

Table 19-48 Change in Traffic Flow / Day (DMRB LA112 Table 3.11) 2044 (With Mitigation)

Link ID	Street Name	Two-way AADT (DM)	Two-way AADT (DS2)	Traffic Flow DM	Traffic Flow DS2	Magnitude Step Change in Traffic_DM-DS2
16	Shortthorn Road	3,890	1,450	Very Low	Low	Very Low
18	Bell Road	1,130	1,190	Very Low	Very Low	Very Low
24	Low Road	7,710	8,000	Low	Medium	Low
92	Mattishall Road	1,920	2,190	Very Low	Very Low	Very Low
108	Burgh Lane	1,890	2,580	Very Low	Very Low	Very Low
109	South Green / Mill Street	2,390	3,000	Very Low	Very Low	Very Low
117	The Common	4,940	4,900	Low	Low	Low
118	Heath Road	4,940	4,900	Low	Low	Low
165	Old Fakenham Road	1,510	1,120	Very Low	Very Low	Very Low
228	Taverham Road	4,510	4,350	Low	Medium	Very Low
230	The Street, Felthorpe	5,120	4,160	Low	Medium	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	16,010	39,660	High	High	High
254	A1270 (Reepham Rd & Drayton Ln)	27,920	40,040	High	High	High

Table 19-49 Change in Severance (TAG Unit A4.1 Table 5.1) 2044 (With Mitigation)

Link ID	Street Name	DM Severance (without Scheme)	DS2 Severance (with Scheme)	Magnitude Step Change in Severance (DM-DS2)
16	Shortthorn Road	Medium	Low	Low
18	Bell Road	Low	Medium	Low
24	Low Road	Low	Medium	Low
92	Mattishall Road	Low	Medium	Low
108	Burgh Lane	Low	Medium	Low
109	South Green / Mill Street	Low	Medium	Low
117	The Common	Low	Low	Very Low
118	Heath Road	High	High	Very Low
165	Old Fakenham Road	Low	Low	Very Low
228	Taverham Road	Low	Low	Very Low
230	The Street, Felthorpe	High	High	Very Low
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	High	Very Low
254	A1270 (Reepham Rd & Drayton Ln)	High	high	Very Low

19.18.62 The step change between the DM and DS1 case for the traffic flow and severance thresholds have been combined to provide an overall step change. This has then been combined with the receptor sensitivity ratings to generate the significance of effect. This is summarised in **Table 19-50**.

Table 19-50 Pedestrian and Cycle Delay - Significance of Effect – 2044 (With Mitigation)

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM-DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Very Low	Low	Very Low	Medium	Minor	Beneficial
18	Bell Road	Very Low	Low	Very Low	High	Minor	**Adverse**
24	Low Road	Low	Low	Low	Medium	Minor	**Adverse**
92	Mattishall Road	Very Low	Low	Very Low	Low	Negligible	**Adverse**
108	Burgh Lane	Very Low	Low	Very Low	Medium	Minor	**Adverse**
109	South Green / Mill Street	Very Low	Low	Very Low	High	Minor	**Adverse**
117	The Common	Low	Very Low	Very Low	High	Minor	Beneficial
118	Heath Road	Low	Very Low	Very Low	Medium	Minor	Beneficial

Link ID	Street Name	Magnitude Step Change in Traffic_DM-DS2	Magnitude Step Change in Severance (DM-DS2)	Combined Magnitude of Change (DM-DS2)	Receptor Sensitivity	Effect Significance	Effect Polarity
165	Old Fakenham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
228	Taverham Road	Very Low	Very Low	Very Low	High	Minor	Beneficial
230	The Street, Felthorpe	Very Low	Very Low	Very Low	High	Minor	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	High	Very Low	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	High	Very Low	Low	very Low	Negligible	**Adverse**

19.18.63 The assessment in **Table 19-50** shows that in 2044 all links would experience a **negligible to minor adverse / beneficial** effect on pedestrian and cycle delay which is **not significant**.

Fear and Intimidation

19.18.64 The approach used for assessing the effects on fear and intimidation is summarised **Section 19.6**. All the links scoped into the study have been assessed using the thresholds set out in the IEMA guidance (**Ref 15**) to determine what the level of fear and intimidation which would be experienced by non-motorised users with and without the Proposed Scheme in place.

19.18.65 **Table 19-2 Error! Reference source not found.**summarises the recommended criteria set out in the IEMA guidance (**Ref 15**). This has been applied to the base and forecast flows to estimate the magnitude of change in fear and intimidation between the DM and DS cases. This has then been combined with the receptor sensitivity to estimate the significance of effect.

Degree of Hazard

19.18.66 To estimate the magnitude of change, the degree of hazard has been assessed with reference to the established thresholds (Crompton and Gilbert, 1976 study), and a score has been provided for each highway link under consideration. Table 3.1 (Error! Reference source not found. of this ES) of the IEMA guidance (**Ref 15**) provides an example of a scoring system which has been adapted for this assessment.

19.18.67 The total score from all three elements (a+b+c) of the degree of hazard calculations is combined to provide a 'level' of fear and intimidation as shown in Table 3.2 of the IEMA guidance (summarised in **Table 19-2** of this ES):

- Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)
- Total 18-hour heavy vehicle flow (b)
- Average vehicle speed18 (c).

Scenario 1 & 2 (2029) (Without Mitigation)

19.18.68 The degree of hazard and level of fear and intimidation for the DM and DS1 cases have been set out in in the tables overleaf.

Table 19-51 Level of Fear and Intimidation Degree of Hazard– 2029 (DM)

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
14	Brick Kiln Rd	59	0	25	0	0	10	+10	Small
16	Shortthorn Rd	193	40	40	0	0	30	+30	Great
18	Bell Road	58	40	31	0	0	20	+20	Small
20	Honingham Rd	43	30	34	0	0	20	+20	Small
108	Burgh Lane	97	50	31	0	0	20	+20	Small
109	South Green / Mill Street	114	50	31	0	0	20	+20	Small

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
117	The Common	262	100	28	0	0	10	+10	Small
140	A47	81	40	50	0	0	30	+30	Great
150	Station Road	23	0	31	0	0	20	+20	Small
165	Old Fakenham	96	30	22	0	0	10	+10	Small
228	Taverham Rd	187	30	31	0	0	20	+20	Small
230	The Street, Felthorpe	225	50	31	0	0	20	+20	Small

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
248	A1270 (Fakenham Rd & Fir Covert Rd)	691	400	68	10	0	30	+40	Extreme
254	A1270 (Reepham Rd & Draytor Ln)	1,265	500	68	20	0	30	+50	Extreme

Table 19-52 Level of Fear and Intimidation Degree of Hazard – 2029 (DS1- without mitigation)

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
14	Brick Kiln Rd	84	20	25	0	0	10	+10	Small
16	Shortthorn Rd	322	60	40	0	0	30	+30	Great
18	Bell Road	77	50	31	0	0	20	+20	Small
20	Honingham Rd	62	50	34	0	0	20	+20	Small
108	Burgh Lane	128	70	31	0	0	20	+20	Small

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
109	South Green / Mill Street	136	60	31	0	0	20	+20	Small
117	The Common	254	140	28	0	0	10	+10	Small
140	A47	119	50	50	0	0	30	+30	Great
150	Station Road	114	30	31	0	0	20	+20	Small
165	Old Fakenham	162	50	22	0	0	10	+10	Small

Link ID	Street Name	Average 18 Hour Daily Flow	Total 18 hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18 hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
228	Taverham Road	406	70	31	0	0	20	+20	Small
230	The Street, Felthorpe	417	100	31	0	0	20	+20	Small
248	A1270 (Fakenham Rd & Fir Covert)	1,723	850	68	20	0	30	+50	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1,684	890	68	20	0	30	+50	Extreme

19.18.69 The assessments above demonstrate that in the DM case (**Table 19-51**), the flows on the network will result in a small level of fear and intimidation except Shortthorn Road and the A47 (Link 140) between Taverham Road & Dereham Road where a great level of fear and intimidation is expected.

19.18.70 Also, the A1270 between Fakenham Rd & Fir Covert and Reepham Road & Drayton Lane are expected to see an extreme level of fear and intimidation due to high proportion of HGVs, speeds and total traffic volume.

19.18.71 The magnitude of impact is approximated with reference to the changes in the level of fear and intimidation from baseline conditions (DM). This is shown in **Table 19-53** below adapted from Table 3.3 of the IEMA guidance. The magnitude of change will be combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation.

Table 19-53 Fear and Intimidation Magnitude of Change and Significance of Effect 2029 DS1- (without mitigation)

ID	Street Name	DM Level of F&I	DS1 Level of F&I	DS1 Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Rd	Small	Small	0	<400	<500	Negligible	Low	Negligible	**Adverse**
16	Shortthorn Rd	Great	Great	0	<400	<500	Negligible	Medium	Negligible	Beneficial
18	Bell Road	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**

ID	Street Name	DM Level of F&I	DS1 Level of F&I	DS1 Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
20	Honingham Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
108	Burgh Lane	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Adverse**
109	South Green / Mill Street	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**
117	The Common	Small	Small	0	<400	<500	Negligible	High	Negligible	**Beneficial**
140	A47	Great	Great	0	<400	<500	Negligible	Very Low	Negligible	**Adverse**
150	Station Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
165	Old Faken-ham	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
228	Taverham Rd	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
230	The Street, Felthorpe	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial

ID	Street Name	DM Level of F&I	DS1 Level of F&I	DS1 Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
248	A1270 (Fakenham Rd & Fir Covert)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	Extreme	Extreme	0	>400	<500	Low	very Low	Negligible	**Adverse**

19.18.72 The assessment in **Table 19-53** demonstrates that in 2029 the changes in the level of fear and intimidation and degree of hazard between the DM and DS1 Scenarios is expected to be a **permanent, negligible beneficial / adverse** effect which is **not significant**.

Scenario 1 & 2 (2044) Without Mitigation

19.18.73 The degree of hazard and level of fear and intimidation for the DM and DS2 cases have been set out in in the tables overleaf.

Table 19-54 Level of Fear and Intimidation Degree of Hazard – 2044 (DM - Without Mitigation)

ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
16	Shortthorn Rd	193	30	40	0	0	30	+30	Great
18	Bell Road	58	40	31	0	0	20	+20	Small
20	Honingham Rd	43	40	34	0	0	20	+20	Small
24	Low Road	388	30	31	0	0	20	+20	Small
92	Mattishall Road	92	70	37	0	0	20	+20	Small
108	Burgh Lane	97	60	31	0	0	20	+20	Small

ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
109	South Green / Mil Street	114	50	31	0	0	20	+20	Small
117	The Common	262	110	28	0	0	10	+10	Small
118	Heath Road	262	110	37	0	0	20	+20	Small
150	Station Road	23	0	31	0	0	20	+20	Small
165	Old Fakenham	96	30	22	0	0	10	+10	Small

ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
228	Taverham Rd	187	30	31	0	0	20	+20	Small
230	The Street, Felthorpe	225	50	31	0	0	20	+20	Small
248	A1270 (Fakenham & Fir Covert Rd)	691	470	68	10	0	30	+40	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1265	560	68	20	0	30	+50	Extreme

Table 19-55 Level of Fear and Intimidation Degree of Hazard – 2044 (DS1- without mitigation)

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
16	Shortthorn Road	322	60	37	0	0	20	+20	Small
18	Bell Road	77	80	34	0	0	20	+20	Small
20	Honingham Road	62	70	34	0	0	20	+20	Small
24	Low Road	408	70	31	0	0	20	+20	Small
92	Mattishall Road	119	120	37	0	0	20	+20	Small
108	Burgh Lane	128	90	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
109	South Green / Mill Street	136	90	31	0	0	20	+20	Small
117	The Common	254	170	28	0	0	10	+10	Small
118	Heath Road	254	170	37	0	0	20	+20	Small
150	Station Road	114	40	31	0	0	20	+20	Small
165	Old Fakenham Road	162	60	22	0	0	10	+10	Small
228	Taverham Road	406	100	31	0	0	20	+20	Small
230	The Street, Felthorpe	417	120	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
248	A1270 (Fakenham Rd & Fir Covert Rd)	1,723	870	68	20	0	30	+50	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1,684	870	68	20	0	30	+50	Extreme

19.18.74 The assessments above demonstrate that in the DM (**Table 19-54**) and DS1 (**Table 19-55**), cases the flows on the network will result in a small level of fear and intimidation except the A1270 between Fakenham Rd & Fir Covert and Reepham Road & Drayton Lane are expected to see an extreme level of fear and intimidation due to high proportion of HGVs, total traffic volume and speeds.

19.18.75 The magnitude of change has been combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation shown in the table below.

Table 19-56 Fear and Intimidation Magnitude of Change and Significance of Effect 2044 (DS1- without mitigation)

Link ID	Street Name	DM Level of fear and intimidation	DS1 Level of fear and intimidation	DS1_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Great	Small	-2	<400	<500	Negligible	Medium	Negligible	Beneficial
18	Bell Road	Small	Small	0	<400	<500	Negligible	High	Negligible	Adverse
20	Honingham Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
24	Low Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Adverse
92	Mattishall Rd	Small	Small	0	<400	<500	Negligible	Low	Negligible	Adverse
108	Burgh Lane	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Adverse
109	South Green / Mill Street	Small	Small	0	<400	<500	Negligible	High	Negligible	Adverse
117	The Common	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
118	Heath Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
150	Station Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial

Link ID	Street Name	DM Level of fear and intimidation	DS1 Level of fear and intimidation	DS1_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
165	Old Fakenham Road	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
228	Taverham Road	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
230	The Street, Felthorpe	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	Adverse

19.18.76 The assessment in **Table 19-56** demonstrates that in 2044 the changes in the level of fear and intimidation and degree of hazard between the DM and DS1 Scenarios is expected to be a **permanent, negligible beneficial / adverse** effect which is **not significant**.

Scenario 1 & 3 (2029) With Mitigation

19.18.77 The degree of hazard and level of fear and intimidation for the DM and DS1 cases have been set out in in the tables overleaf.

Table 19-57 Level of Fear and Intimidation Degree of Hazard – 2029 (DM – With Mitigation)

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
14	Brick Kiln Rd	59	0	25	0	0	10	+10	Small
16	Shortthorn Rd	193	40	40	0	0	30	+30	Great
18	Bell Road	58	40	31	0	0	20	+20	Small
20	Honingham Rd	43	30	34	0	0	20	+20	Small
108	Burgh Lane	97	50	31	0	0	20	+20	Small
109	South Green / Mill Street	114	50	31	0	0	20	+20	Small
117	The Common	262	100	28	0	0	10	+10	Small
140	A47	81	40	50	0	0	30	+30	Great
150	Station Road	23	0	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
165	Old Fakenham	96	30	22	0	0	10	+10	Small
228	Taverham Rd	187	30	31	0	0	20	+20	Small
230	The Street, Felthorpe	225	50	31	0	0	20	+20	Small
248	A1270 (Fakenham Rd & Fir Covert Rd)	691	400	68	10	0	30	+40	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1,265	500	68	20	0	30	+50	Extreme

Table 19-58 Level of Fear and Intimidation Degree of Hazard – 2029 (DS2- with mitigation)

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
14	Brick Kiln Rd	73	10	25	0	0	10	+10	Small
16	Shortthorn Rd	71	20	37	0	0	20	+20	Small
18	Bell Road	60	0	31	0	0	20	+20	Small
20	Honingham Rd	38	0	34	0	0	20	+20	Small
108	Burgh Lane	135	70	31	0	0	20	+20	Small
109	South Green / Mill Street	148	70	31	0	0	20	+20	Small
117	The Common	256	140	28	0	0	10	+10	Small
140	A47	114	50	50	0	0	30	+30	Great
150	Station Road	0	0	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
165	Old Fakenham	65	40	22	0	0	10	+10	Small
228	Taverham Road	183	30	25	0	0	10	+10	Small
230	The Street, Felthorpe	173	40	31	0	0	20	+20	Small
248	A1270 (Fakenham Rd & Fir Covert)	1,703	850	68	20	0	30	+50	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1,850	910	68	30	0	30	+60	Extreme

19.18.78 The assessments above demonstrate that in the DM case (**Table 19-57**) and DS1 case (**Table 19-58**) the flows on the network will result in a small level of fear and intimidation except A47 (Link 140) between Taverham Road & Dereham Road where a great level of fear and intimidation is expected.

19.18.79 Also, the A1270 between Fakenham Rd & Fir Covert and Reepham Road & Drayton Lane are expected to see an extreme level of fear and intimidation due to high proportion of HGVs, speeds and total traffic volume.

19.18.80 The magnitude of change has been combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation. The results are shown below.

Table 19-59 Fear and Intimidation Magnitude of Change and Significance of Effect 2029 (DS2- with mitigation)

Link ID	Street Name	DM Level of fear and intimidation	DS1 Level of fear and intimidation	DS1_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
14	Brick Kiln Rd	Small	Small	0	<400	<500	Negligible	Low	Negligible	**Adverse**
16	Shortthorn Rd	Great	Small	-2	<400	<500	Negligible	Medium	Negligible	Beneficial
18	Bell Road	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**
20	Honingham Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
108	Burgh Lane	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Adverse**
109	South Green / Mill Street	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**
117	The Common	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial

140	A47	Great	Great	0	<400	<500	Negligible	Very Low	Negligible	**Adverse**
150	Station Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
165	Old Fakenham	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
228	Taverham Rd	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
230	The Street, Felthorpe	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
248	A1270 (Fakenham Rd & Fir Covert)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	Extreme	Extreme	0	>400	<500	Low	very Low	Negligible	**Adverse**

19.18.81 The assessment in **Table 19-59** demonstrates that in 2029 the changes in the level of fear and intimidation and degree of hazard between the DM and DS2 Scenarios is expected to be a **permanent, negligible beneficial / adverse** effect which is **not significant**.

Scenario 1 & 3 (2044) (With Mitigation)

19.18.82 The degree of hazard and level of fear and intimidation for the DM and DS2 (with mitigation) cases have been set out in in the tables overleaf.

Table 19-60 Level of Fear and Intimidation Degree of Hazard – 2044 (DM)

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
16	Shortthorn Rd	193	30	40	0	0	30	+30	Great
18	Bell Road	58	40	31	0	0	20	+20	Small
20	Honingham Rd	43	40	34	0	0	20	+20	Small
24	Low Road	388	30	31	0	0	20	+20	Small
92	Mattishall Road	92	70	37	0	0	20	+20	Small
108	Burgh Lane	97	60	31	0	0	20	+20	Small
109	South Green / Mill Street	114	50	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
117	The Common	262	110	28	0	0	10	+10	Small
118	Heath Road	262	110	37	0	0	20	+20	Small
150	Station Road	23	0	31	0	0	20	+20	Small
165	Old Fakenham	96	30	22	0	0	10	+10	Small
228	Taverham Rd	187	30	31	0	0	20	+20	Small
230	The Street, Felthorpe	225	50	31	0	0	20	+20	Small
248	A1270 (Fakenham & Fir Covert Rd)	691	470	68	10	0	30	+40	Extreme

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
254	A1270 (Reepham Rd & Drayton Ln)	1,265	560	68	20	0	30	+50	Extreme

Table 19-61 Level of Fear and Intimidation Degree of Hazard – 2044 (DS1- with mitigation)

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
16	Shortthorn Road	71	20	37	0	0	20	+20	Small
18	Bell Road	60	0	34	0	0	20	+20	Small
20	Honingham Road	38	0	34	0	0	20	+20	Small
24	Low Road	401	70	31	0	0	20	+20	Small
92	Mattishall Road	104	70	37	0	0	20	+20	Small
108	Burgh Lane	135	80	31	0	0	20	+20	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
109	South Green / Mill Street	148	90	31	0	0	20	+20	Small
117	The Common	256	150	28	0	0	10	+10	Small
118	Heath Road	256	150	37	0	0	20	+20	Small
150	Station Road	0	0	31	0	0	20	+20	Small
165	Old Fakenham Road	65	40	22	0	0	10	+10	Small
228	Taverham Road	183	60	25	0	0	10	+10	Small

Link ID	Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
230	The Street, Felthorpe	173	70	31	0	0	20	+20	Small
248	A1270 (Fakenham Rd & Fir Covert Rd)	1703	870	68	20	0	30	+50	Extreme
254	A1270 (Reepham Rd & Drayton Ln)	1,850	950	68	30	0	30	+60	Extreme

19.18.83 The assessments above demonstrate that in the DM (**Table 19-60**) and DS1 (**Table 19-61**), cases the flows on the network will result in a small level of fear and intimidation except the A1270 between Fakenham Rd & Fir Covert

and Reepham Road & Drayton Lane are expected to see an extreme level of fear and intimidation due to high proportion of HGVs, total traffic volume and speeds.

19.18.84 The magnitude of change has been combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation. The results are shown in **Table 19-62**.

Table 19-62 Fear and Intimidation Magnitude of Change and Significance of Effect 2044 DS2- (with mitigation)

Link ID	Street Name	DM Level of fear and intimidation	DS2 Level of fear and intimidation	DS2_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
16	Shortthorn Road	Great	Small	-2	<400	<500	Negligible	Medium	Negligible	Beneficial
18	Bell Road	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**
20	Honingham Rd	Small	Small	0	<400	<500	Negligible	Medium	Negligible	Beneficial
24	Low Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Adverse**
92	Mattishall Rd	Small	Small	0	<400	<500	Negligible	Low	Negligible	**Adverse**
108	Burgh Lane	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Adverse**

Link ID	Street Name	DM Level of fear and intimidation	DS2 Level of fear and intimidation	DS2_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
109	South Green / Mill Street	Small	Small	0	<400	<500	Negligible	High	Negligible	**Adverse**
117	The Common	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
118	Heath Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Beneficial**
150	Station Road	Small	Small	0	<400	<500	Negligible	Medium	Negligible	**Beneficial**
165	Old Fakenham Road	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
228	Taverham Road	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial

Link ID	Street Name	DM Level of fear and intimidation	DS2 Level of fear and intimidation	DS2_Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
230	The Street, Felthorpe	Small	Small	0	<400	<500	Negligible	High	Negligible	Beneficial
248	A1270 (Fakenham Rd & Fir Covert Rd)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	**Adverse**
254	A1270 (Reepham Rd & Drayton Ln)	Extreme	Extreme	0	>400	<500	Low	Very Low	Negligible	**Adverse**

19.18.85 The assessment in **Table 19-62** demonstrates that in 2044 the changes in the level of fear and intimidation and degree of hazard between the DM and DS2 Scenarios is expected to be a **permanent, negligible beneficial / adverse** effect which is **not significant**.

Pedestrian and Cycle Amenity

19.18.86 The approach used for assessing the effects on amenity is summarised in **Section 19.6**.

Scenario 1 & 2 (Without Mitigation)

19.18.87 The assessment of amenity during the operational phase is included in the tables overleaf.

Table 19-63 Pedestrian and Cycle Amenity – 2029 (Without Mitigation)

Link ID	Street Name	DM	DS1	DS-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
14	Brick Kiln Road	1,030	1,460	42%	0.50	High	Low	Medium	Very Low	Minor	Adverse
16	Shortthorn Road	3,360	5,580	66%	0.50	High	Medium	High	Very Low	Minor	Adverse
18	Bell Road	1,000	1,330	33%	1.00	High	High	High	Very Low	Minor	Adverse
108	Burgh Lane	1,690	2,230	32%	1.00	High	Medium	High	Very Low	Minor	Adverse
109	South Green / Mill Street	1,980	2,360	19%	1.00	High	High	High	Very Low	Minor	Adverse
117	The Common	4,540	4,410	-3%	1.00	High	High	High	Very Low	Minor	Beneficial
140	A47	1,410	2,070	47%	0.00	High	Very Low	Low	Very Low	Negligible	Adverse
165	Old Fakenham	1,660	2,810	69%	0.00	High	High	High	Very Low	Minor	Adverse

Link ID	Street Name	DM	DS1	DS-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
228	Taverham Rd	3,240	7,040	117%	0.50	High	High	High	Low	**Moderate**	**Adverse**
230	The Street, Felthorpe	3,900	7,240	86%	0.50	High	High	High	Very Low	Minor	Adverse
248	A1270 (Fakenham& Fir Covert Rd)	11,990	29,900	149%	0.00	High	Very Low	Low	Low	Minor	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	21,950	29,230	33%	0.00	High	very Low	Low	Very Low	Negligible	Adverse

Table 19-64 Pedestrian and Cycle Amenity – 2044 (Without Mitigation)

Link ID	Street Name	DM	DS1	DS1-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
16	Shortthorn Rd	3,890	6,170	59%	0.50	High	Medium	High	Very Low	Minor	Adverse
18	Bell Road	1,130	1,920	70%	1.00	High	High	High	Very Low	Minor	Adverse
24	Low Road	7,710	8,200	6%	1.00	High	Medium	High	Very Low	Minor	Adverse
92	Mattishall Rd	1,920	2,840	48%	0.00	High	Low	Medium	Very Low	Minor	Adverse
108	Burgh Lane	1,890	2,460	30%	1.00	High	Medium	High	Very Low	Minor	Adverse
109	South Green / Mill Street	2,390	2,730	14%	1.00	High	High	High	Very Low	Minor	Adverse
117	The Common	4,940	4,850	-2%	1.00	High	High	High	Very Low	Minor	Beneficial
118	Heath Road	4,940	4,850	-2%	1.00	High	Medium	High	Very Low	Minor	Beneficial
165	Old Fakenham	1,510	3,040	101%	0.00	High	High	High	Very Low	Minor	Adverse
228	Taverham Road	4,510	8,140	80%	0.50	High	High	High	Very Low	Minor	Adverse
230	The Street, Felthorpe	5,120	8,340	63%	0.50	High	High	High	Very Low	Minor	Adverse

Link ID	Street Name	DM	DS1	DS1-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
248	A1270 (Fakenham & Fir Covert)	16,010	39,460	146%	0.00	High	Very Low	Low	Low	Minor	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	27,920	36,470	31%	0.00	High	very Low	Low	Very Low	Negligible	Adverse

19.18.88 As demonstrated in **Table 19-63**, in 2029 Taverham Road would experience a **permanent moderate adverse** effect on amenity which is **significant**.

19.18.89 The Common is expected to see a **permanent minor beneficial** effect which is **not significant**.

19.18.90 The remaining links are expected to see a **permanent minor or negligible** effect on amenity which is **not significant**.

19.18.91 In 2044, the assessment (**Table 19-64**) shows that The Common and Heath Road are expected to see a **permanent minor beneficial** effect which is **not significant**.

19.18.92 The remaining links are expected to see a **permanent minor or negligible** effect on amenity which is **not significant**.

Scenario 1 & 3 (With Mitigation)

19.18.93 Following mitigation, the outcome of the effect on amenity is set out within the tables overleaf.

Table 19-65 Pedestrian and Cycle Amenity – 2029 (With Mitigation)

ID	Street Name	DM	DS2	DS2-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
14	Brick Kiln Road	1,030	1,260	22%	0.50	High	Low	Medium	Very Low	Minor	Adverse
16	Shortthorn Road	3,360	1,220	-64%	0.50	High	Medium	High	Very Low	Minor	Beneficial
18	Bell Road	1,000	1,050	5%	1.00	High	High	High	Very Low	Minor	Adverse
108	Burgh Lane	1,690	2,340	38%	1.00	High	Medium	High	Very Low	Minor	Adverse
109	South Green / Mill Street	1,980	2,570	30%	1.00	High	High	High	Very Low	Minor	Adverse
117	The Common	4,540	4,440	-2%	1.00	High	High	High	Very Low	Minor	Beneficial
140	A47	1,410	1,990	41%	0.00	High	Very Low	Low	Very Low	Negligible	Adverse
165	Old Fakenham	1,660	1,120	-33%	0.00	High	High	High	Very Low	Minor	Beneficial

ID	Street Name	DM	DS2	DS2-DM (%)	Footway Width (DS1) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
228	Taverham Rd	3,240	3,190	-2%	0.50	High	High	High	Very Low	Minor	Beneficial
230	The Street, Felthorpe	3,900	3,010	-23%	0.50	High	High	High	Very Low	Minor	Beneficial
248	A1270 (Fakenham& Fir Covert Rd)	11,990	29,570	147%	0.00	High	Very Low	Low	Low	Minor	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	21,950	32,110	46%	0.00	High	very Low	Low	Very Low	Negligible	Adverse

Table 19-66 Pedestrian and Cycle Amenity – (Scenario 1&3) 2044 (With Mitigation)

ID	Street Name	DM	DS2	DS2-DM (%)	Footway Width (DS2) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
16	Shortthorn Rd	3,890	1,450	-63%	0.50	High	Medium	High	Very Low	Minor	Beneficial
18	Bell Road	1,130	1,190	5%	1.00	High	High	High	Very Low	Minor	Adverse
24	Low Road	7,710	8,000	4%	1.00	High	Medium	High	Very Low	Minor	Adverse
92	Mattishall Rd	1,920	2,190	14%	0.00	High	Low	Medium	Very Low	Minor	Adverse
108	Burgh Lane	1,890	2,580	37%	1.00	High	Medium	High	Very Low	Minor	Adverse
109	South Green / Mill Street	2,390	3,000	26%	1.00	High	High	High	Very Low	Minor	Adverse
117	The Common	4,940	4,900	-1%	1.00	High	High	High	Very Low	Minor	Beneficial
118	Heath Road	4,940	4,900	-1%	1.00	High	Medium	High	Very Low	Minor	Beneficial
165	Old Fakenham	1,510	1,120	-26%	0.00	High	High	High	Very Low	Minor	Beneficial
228	Taverham Road	4,510	4,350	-4%	0.50	High	High	High	Very Low	Minor	Beneficial
230	The Street, Felthorpe	5,120	4,160	-19%	0.50	High	High	High	Very Low	Minor	Beneficial

ID	Street Name	DM	DS2	DS2-DM (%)	Footway Width (DS2) (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude Step Change (DM to DS)	Effect Significance	Effect Polarity
248	A1270 (Fakenham & Fir Covert)	16,010	39,660	148%	0.00	High	Very Low	Low	Low	Minor	Adverse
254	A1270 (Reepham Rd & Drayton Ln)	27,920	40,040	43%	0.00	High	very Low	Low	Very Low	Negligible	Adverse

19.18.94 As demonstrated in **Table 19-65** and **Table 19-66** in 2029 and 2044 following mitigation, all links are expected to experience a **permanent minor or negligible adverse / beneficial** effect on amenity which is **not significant**.

Driver Delay

Scenario 1 & 2 (Without Mitigation)

19.18.95 The approach used for assessing the effects on driver delay is summarised in **Section 19.6.** Changes in delay below 20 seconds is considered very low, between 20 to 30 seconds is low, 30 to 60 seconds is medium and above 60 seconds is high.

19.18.96 As set out in the IEMA guidance, Driver Delay is only likely to be an issue requiring consideration of mitigation where junctions are operating beyond capacity. Individual junctions on the network have been assessed and junction arms with RFCs at or above 0.85 (theoretical capacity) have been considered for assessment. The assessment of Driver Delay has been based on 2039 flows at the junctions, thus 10 years after the opening of the Proposed Scheme. All links scoped out as part of the screening process have RFCs below 0.85 as such these have not been considered for Driver Delay.

19.18.97 **Table 19-67** shows the difference in delay with (DS) and without (DM) the Proposed Scheme and Proposed Scheme + mitigation (DS2) at junction arms at or near capacity.

Table 19-67 Driver Delay (Without Mitigation)

Link ID	Junction	Street Name	DM Driver Delay (sec)	DS1 Driver Delay (sec)	Mean Delay Increase (sec)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
35	J13	A1074	64	49	-15	High	Very Low	Minor	Beneficial
36	J13	Longwater Lane	64	49	-15	Medium	Very Low	Minor	Beneficial
43	J20	Costessey Lane	168	71	-97	Very Low	High	Minor	Beneficial
62	J4	Marl Hill Road	290	0	-290	Very Low	High	Minor	Beneficial
255	J21	A1270	1,389	64	-1,325	Very Low	High	Minor	Beneficial

19.18.98 **Table 19-67** demonstrates that the Proposed Scheme results in a net beneficial effect on the network within the Study Area. The results show no perceptible change in delay following the Proposed Scheme at most junctions.

19.18.99 The effect under this Scenario will be **permanent**, **minor**, **beneficial** effect which is not significant.

Scenario 1 & 3 (With Mitigation)

19.18.100 Following the proposed mitigation, **Table 19-68** below shows the changes in delay.

Table 19-68 Driver Delay (With Mitigation)

Link ID	Junction	Street Name	DM Driver Delay (sec)	DS2 Driver Delay (sec)	Mean Delay Increase (sec)	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
35	J13	A1074	64	49	-15	High	Very Low	Minor	Beneficial
36	J13	Longwater Lane	64	49	-15	Medium	Very Low	Minor	Beneficial
43	J20	Costessey Lane	168	85	-83	Very Low	High	Negligible	Beneficial
62	J4	Marl Hill Road	290	0	-290	Very Low	High	Minor	Beneficial
255	J21	A1270	1,389	65	-1,324	Very Low	High	Minor	Beneficial

19.18.101 **Table 19-68** demonstrate that the Proposed Scheme results in a net beneficial effect on the network within the Study Area. The results show no perceptible change in delay following the Proposed Scheme at most junctions.

19.18.102 The effect under this Scenario will be at worst **permanent**, **negligible**, **adverse** effect on Costessey Lane which is **not significant**.

Accident and Road Safety

19.18.103 The approach used for assessing the effects on accident and road safety is **summarised** in **Section 19.6.** Changes in traffic flow have been based on the vehicle flow thresholds sets out in Table 3.11 of DMRB LA112 to estimate the magnitude of change.

19.18.104 As discussed in **Section 19.6**, the sensitivity criteria for highway users is based on a qualitative assessment of links using the iRAP (**Table 19-4**) **ratings** combined with a review of the collision clusters (**Table 19-5**) and the receptor sensitivity criteria (**Table 16-7**) to determine the overall road safety sensitivity of discrete areas of the highway network. The full link sensitivity assessment is provided at **Appendix 6: Link Sensitivity Assessment (Document Reference 3.19.06)** and the full assessment of significance of effect is provided at **Appendix 7: Assessment of Operational Effects** (Document Reference: 3.19.07)**.**

19.18.105 It is worth noting that for Accident and Road Safety all links within the Study Area were assessed. All links are expected to see a **permanent negligible adverse** / **beneficial** effect on accident and road safety in all Scenarios which is **not significant**.

19.19 Additional Mitigation and Monitoring

19.19.1 This section summarises the need for any additional mitigation following the implementation of all necessary embedded mitigation.

Construction Phase Mitigation

19.19.2 Ringland Lane would be mitigated with a parallel haul road, so would halve the impact and prevent collisions as the haul road would operate as a one-way loop with the existing carriageway catering for the opposite direction.

19.19.3 Ringland Lane, would be closed for about one year during construction. The Broadway would offer an alternative route during this time for Non-Motorised Users only and a small number of authorised vehicles.

19.19.4 Temporary PRoW diversions or closures for FP1 and RB1 can be arranged via the Local Highway Authority. Any PRoW closures would need to be timed appropriately with the construction phasing. The detail of arrangements to be made for diversion or temporary closure of PRoW crossing the scheme at the appropriate time would taken forward via the temporary traffic regulation order process.

19.19.5 Marl Hill Road would have localised widening to accommodate sufficient width to enable two HGVs to pass safely. Chicane features or single lane sections would be included to prevent the need for tree removal at pinch points.

19.19.6 The effects on these routes would be relatively short term and temporary during construction. The effects of construction are expected to be managed adequately with the appropriate traffic management, scheduling and monitoring that will be outlined in the detailed CEMP during the later stages of development planning.

19.19.7 A VMS system will be in place on the wider road network on the approaches to the construction site to inform users in advance of restrictions and temporary changes to access as a result of the various schemes being constructed in the vicinity. This will help minimise confusion for drivers and vehicles will be less likely to route through the construction access routes during the works.

19.19.8 The mitigation of construction related activities has been considered throughout the planning stages of the Proposed Scheme, involving discussions with Local Highway Authority and various local stakeholders including other major projects who are forecast to be operating in the area around the same timeframe as the Proposed Scheme construction period.

19.19.9 A CEMP will be provided to ensure that works are completed safely and effects on the local environment are adequately mitigated. An **Outline CEMP** is provided as an appendix to the ES (Document Reference: 3.03.01).

Operational Phase Mitigation

Scope of Mitigation

19.19.10 In order to scope the extent of mitigation proposed to an appropriate and proportionate scale of works for the Proposed Scheme, a threshold of 1000 vehicle increase per day as a result of the scheme prior to mitigation was set as a criteria for considering links for intervention.

19.19.11 This criteria is the equivalent to the 1000 vehicle threshold for Quiet Lane designation. It is also the magnitude of change required to trigger a 1Db noise increase. It is considered that impacts less than 1000 vehicles per day (i.e., adding a quiet lane equivalent to existing traffic) could be tolerated on the majority of the surrounding road network without adversely affecting the quality of life for local residents. This also equates to the DMRB criteria for scoping of links for Air Quality assessment as specified within LA105.

19.19.12 Link flow traffic mitigation on selected links with changes in flows over 1,000 vehicles a day with the Proposed Scheme in place as compared to the forecast baseline situation. On review of the traffic modelling results in the opening year of 2029 in relation to this criteria (based on a comparison of Do Minimum and Do-Something AADT flows), the following locations were identified as requiring consideration for intervention:

- A1067 Fakenham Road, Drayton
- A1067 Fakenham Road, Attlebridge

- A1270 Broadland Northway
- A47 west of Honingham
- A140 north of A1270
- Shortthorn Road, Felthorpe
- Station Road, Attlebridge
- Bell Road, Barnham Broom

19.19.13 The A-Roads listed above are considered to be suitable for tolerating the forecast magnitude of increase in traffic and applying mitigation to these routes would most likely result in unsustainable re-routing through less suitable side roads. Hence no traffic mitigation is proposed for link flows on A47, A1270, A1067 or A140. Mitigation is therefore proposed for Shortthorn Road, Felthorpe, Station Road, Attlebridge and Bell Road, Barnham Broom. Speed Management measures in these locations (plus Holt Road, Horsford to prevent secondary rat running in response to the above measures) are included in the Do-Something plus Mitigation Scenario only.

19.19.14 The TA also identified additional link mitigation required to enable the network to operate acceptably at peak times in the future assessment year of 2029 and 2044 following the Proposed Scheme opening. This includes:

- Station Road and Felthorpe Road, Attlebridge, access restrictions are proposed to deter through traffic from travelling through the village from Reepham Road and Broad Lane to prevent through movement was found to help reduce traffic movement.
- At Felthorpe, turning restrictions at the staggered crossroads junction of Shorthorn Road and B1149 Holt Road was found to offer a reduction in through traffic travelling through the village from A140 to access the Proposed Scheme. This junction also has a relatively poor accident record and would benefit from changes to enhance user safety. Speed limit reductions were also found to be needed in the villages of

Horsford and Felthorpe to support this proposal to minimise secondary re-routing.

- Changes to speed limits south of A47 through Barnham Broom Road, Carleton Forehoe and in Kimberley and the north of Wymondham to reduce the attractiveness of routes through minor villages to access the Proposed Scheme.

19.19.15 Following the above the assessment of the effect of operational traffic within this chapter shows that there are not expected to be any significant adverse effects during the operational phase given the mitigation measures proposed.

19.19.16 Generally, across the network within the Study Area, there will be a **negligible** to **minor** impact from traffic and transport on receptors due to the Proposed Scheme.

19.19.17 The assessment of the links against the individual criteria thresholds following mitigation resulted in more **beneficial** effects on most links and a **moderate beneficial** effect on severance on Shortthorn Road and Old Fakenham Road which is significant.

19.20 Residual Effects

19.20.1 Based on the assessment within the chapter, the Proposed Scheme will see no significant residual effects. The redistribution of trips will however mean that the A1270 will see an increase in traffic flow following the mitigation. The A1270 and adjacent junctions however have capacity as per the modelling results, the level of effect is therefore **not significant**.

19.21 Cumulative Assessment

Construction

19.21.1 Construction of the Proposed Scheme is likely to coincide with the construction of other schemes (A47 dualling and STS schemes) and developments within the area. A committed development allocations

assessment was undertaken separately to assesses the in-combination impact of the Proposed Scheme and STS schemes. This is provided at **Appendix 5: In-Combination Assessment of Committed Development** (Document Reference: 3.19.05).

19.21.2 The assessment revealed that most proposed developments within the area are located remotely from the site and the construction effects will have a negligible or minor effect in combination with the Proposed Scheme.

19.21.3 The CSTM works, thus; a range of supplementary interventions that would be brought forward in the wider west of Norwich region complementary to, but distinct from, the Proposed Scheme, would be carried out after the Proposed Scheme is completed so there would be no in-combination effects during construction. These works do not form part of the Proposed Scheme but are complementary measures.

19.21.4 The DEP and SEP project has however been considered in Section 19.16 in terms of construction traffic impact due to the proximity of the onshore cable routes to the Proposed Scheme corridor. The HOW3 scheme is also under construction currently and unlikely to have significant in combination effects.

19.21.5 The change in traffic flows based on the IEMA guidance for link selection have been set out in **Table 19-69**.

Table 19-69 Total two-way Construction Traffic and Magnitude of Impact

Link	2019 Base (All Vehicles)	NWL	Impact	DEP and SEP	Impact	In-Combination Flows	In-Combination Impact
A1067 (East of Marl Hill Road)	16,206	196	1%	129	1%	325	2%
A1067 (West of Marl Hill Road)	16,206	420	3%	0	0%	420	3%
Marl Hill Road	2,829	406	14%	62	2%	468	17%
Ringland lane	**279**	**203**	**73%**	**62**	**22%**	**265**	**95%**
Ringland lane (Haul Road)	0	203	0%	0	0%	203	0%
Paddy's Lane	2,829	170	6%	0	0%	170	6%
Wood Lane B1535	2,829	170	6%	0	0%	170	6%
A47 from Wood Lane to Taverham Road	24,851	126	1%	472	2%	598	2%
A47 from Blind Lane to Dereham Road	24,700	126	1%	472	2%	598	2%
A47 from Dereham Road to A1074	35,039	126	0%	417	1%	543	2%
A47 (West of Wood Lane B1535)	24,851	126	1%	0	0%	126	1%

Link	2019 Base (All Vehicles)	NWL	Impact	DEP and SEP	Impact	In-Combination Flows	In-Combination Impact
A1270 from A1067 to Fir Covert Road	8,183	420	5%	81	1%	501	6%

19.21.6 Based on the traffic flows outlined in **Table 19-69**, it is evident that the effects of the construction traffic movements on the strategic 'A' roads are generally less than the typical daily variation of traffic (+ / - 5%), so would not be noticeable to other road users.

19.21.7 **Table 19-69** shows that Ringland Lane has the highest magnitude of impacts, resulting in 95% magnitude of impact when the Proposed Scheme (73%) is considered in combination with the SEP & DEP (22%) schemes. Marl Hill Road is seen to have the second highest impact i.e. 17% when considered cumulatively.

19.21.8 These two links have been assessed have been assessed as worst case for the cumulative effect.

Severance

19.21.9 The complete assessment of severance on the links screened into the assessment is summarised overleaf.

Table 19-70 Construction Traffic Effect on Severance

Link	2019 Base	NWL +SEP & DEP Flow	Base + Construction	Change in Traffic Flows	Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
Marl Hill Road	2,829	468	3,297	17%	Very Low	Very Low	Negligible	Adverse
Ringland Lane	279	265	544	95%	Low	High	**Moderate**	**Adverse**

19.21.10 As shown above Marl Hill Road is expected to see a **temporary , negligible adverse** effect on severance which is **not significant**. Ringland Lane will see a **temporary , moderate adverse effect** on severance which is **significant.**

19.21.11 As discussed in **Section 19.17**, Ringland Lane has a very low base flow, hence the large percentage uplift with the construction traffic added. The route also has a rural character with no properties adjacent and so has a low sensitivity. The two-way flows with both schemes under construction would be less than 1,000 vehicles / day, the effect is therefore not expected to be significant.

19.21.12 That said, Ringland Lane will be mitigated with a parallel haul road. This would likely halve the impact and prevent collisions as the haul road would operate as a one-way loop with the existing carriageway catering for the opposite direction. Ringland Lane would also be closed to public users for approximately one year during construction of the underpass where the Proposed Scheme crosses.

19.21.13 Exercising professional judgement and taking into account the above factors, the effect on Ringland Lane could be expected to be **temporary , minor to negligible adverse** on severance which is **not significant**.

Pedestrian and Cycle Amenity

19.21.14 The complete assessment of amenity during the construction phase is set out below.

Table 19-71 Cumulative Construction Traffic Effect on Pedestrian and Cycle Amenity

Street Name	2019 Base	NWL +SEP & DEP Flow	Base + Construction	Footway Width (m)	Footway Width Sensitivity	Receptor Sensitivity	Overall Receptor Sensitivity	Magnitude	Effect Significance	Effect Polarity
Marl Hill Road	2,829	468	3,235	0	High	Very Low	Low	Very Low	Negligible	Adverse
Ringland lane	279	265	482	0	High	Low	Medium	Very Low	Minor	Adverse

19.21.15 As shown above Marl Hill Road is expected to see a **temporary , negligible adverse** effect on Pedestrian and Cycle Amenity which is **not significant**. Ringland Lane will see a **temporary , minor adverse effect** on Pedestrian and Cycle Amenity which is **not significant.**

Pedestrian and Cycle Delay

19.21.16 The assessment of pedestrian and cycle delay during the construction phase is set out below.

Table 19-72 Change in Cumulative Traffic Flow / Day (DMRB LA112 Table 3.11)

Street Name	Base Flows	NWL Construction Flows	Base + NWL Construction	Change in Traffic Flow	Change in Base Traffic Flow + Construction	Magnitude Step Change in Flow
Marl Hill Road	2829	468	3297	Very Low	Very Low	Very Low
Ringland lane	279	265	544	Very Low	Very Low	Very Low

Table 19-73 Change in Severance (TAG Unit A4.1 Table 5.1)

Street Name	Severance	Construction Severance	Step Change in Severance	Combined Magnitude of Change (Severance + Flow)	Receptor Sensitivity	Effect Significance	Effect Polarity
Marl Hill Road	Low	Low	Very Low	Very Low	Very Low	Negligible	Adverse
Ringland lane	Low	Low	Very Low	Very Low	Low	Negligible	Adverse

19.21.17 As shown above, Marl Hill Road is expected to see a **temporary , negligible adverse** effect on Pedestrian and Cycle Delay which is **not significant**. Ringland Lane will see a **temporary , negligible adverse effect** on Pedestrian and Cycle Delay which is **not significant.**

Fear and Intimidation

19.21.18 The assessment of fear and intimidation during the construction phase is set out below with further details set out within **Appendix A**.

Table 19-74 Level of Fear and Intimidation Degree of Hazard – Base Flows

Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
Marl Hill Road	262	0	28	0	0	10	+10	Small
Ringland lane	11	0	25	0	0	10	+10	Small

Table 19-75 Level of Fear and Intimidation Degree of Hazard – Base Flows + Construction Traffic

Street Name	Average 18_Hour Daily Flow	Total 18-hour heavy vehicle flow	Average Speed (Mph)	Score of Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Score of Total 18-hour heavy vehicle flow (b)	Score of Average vehicle speed (c)	Total hazard score (a)+(b)+(c)	Level of fear and intimidation
Marl Hill Road	288	420	28	0	0	10	+10	Small
Ringland Lane	25	237	25	0	0	10	+10	Small

19.21.19 The assessments above demonstrate that with the base flows on Marl Hill Road and Ringland Lane, they see a small level of fear and intimidation.

19.21.20 The magnitude of change assessed above has been combined with the sensitivity of receptors to deduce the significance of the effect on fear and intimidation. The assessment is as follows.

Table 19-76 Fear and Intimidation Magnitude of Change and Significance of Effect 2029 DS1- (without mitigation)

Street Name	Base Flow Level of F&I	Base Flow + NWL Level of F&I	Step Change Level of F&I	Change in Total 18hr Traffic	Change in 18hr HGV Traffic	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Effect Polarity
Marl Hill Road	Small	Small	0	<400	<500	Negligible	Very Low	Negligible	Adverse
Ringland Lane	Small	Small	0	<400	<500	Negligible	Low	Negligible	Adverse

19.21.21 As shown above, Marl Hill Road and Ringland Lane are expected to see a **temporary, negligible adverse** effect on Fear and Intimidation which is **not significant**.

Accident and Road Safety

19.21.22 The approach used for assessing the effects on accident and road safety is **summarised** in **Section 19.6.**

19.21.23 For Accident and Road Safety, all links within the Study Area were assessed. All links are expected to see a **permanent negligible** effect on accident and road safety which is **not significant**.

19.21.24 The full assessment of all the links is provided within **Appendix 4: In-Combination Assessment** (Document Reference: 3.19.04).

Additional Mitigation and Monitoring

Construction Phase Mitigation

19.21.25 The key highway safety risk is that Ringland Lane and Marl Hill Road have existing width constraints that may lead to conflicts between HGVs. A reduced speed limit and suitable passing laybys would be required as mitigation. This should be possible to achieve within the extents of the Proposed Scheme boundary. Pinch points with give way features would also be introduced so that HGVs do not attempt to pass each other at unsafe locations.

19.21.26 Ringland Lane will be mitigated with a parallel haul road, so would halve the impact and prevent collisions as the haul road would operate as a one-way loop with the existing carriageway catering for the opposite direction. Ringland Lane would also be closed to public users for approximately one year during construction of the underpass where the Proposed Scheme crosses.

19.21.27 Marl Hill Road would have temporary localised widening to accommodate sufficient width to enable two HGVs to pass safely. Chicane features or single lane sections would be included to prevent the need for tree removal at pinch points.

19.21.28 The effects on these routes would be relatively short term and temporary during construction. The effects of construction are expected

to be managed adequately with the appropriate traffic management, scheduling and monitoring that will be outlined in the detailed CEMP during the later stages of development planning.

19.21.29 A VMS system will be in place on the wider road network on the approaches to the construction site to inform users in advance of restrictions and temporary changes to access as a result of the various schemes being constructed in the vicinity. This will help minimise confusion for drivers and vehicles will be less likely to route through the construction access routes during the works.

19.21.30 The mitigation of construction related activities has been considered throughout the planning stages of the Proposed Scheme, involving discussions with Local Highway Authority and various local stakeholders including other major projects who are forecast to be operating in the area around the same timeframe as the Proposed Scheme construction period.

19.21.31 The Hornsea 3 and SEP and DEP windfarm projects are planned to be at various stages of construction at the same time as the Proposed Scheme. Cooperation agreements with the other major projects will be put in place to minimise overlap of construction traffic impact and required project information sharing among parties. So, timings can be managed to minimise disruptions to other parties and local communities. It is noted that the wind farm projects are not anticipated to have any operational traffic, only traffic associated with construction.

19.21.32 An **Outline CEMP** is provided as an appendix to the ES (Document Reference: 3.03.01) to ensure that works are completed safely and effects on the local environment are adequately mitigated.

Operational Phase Mitigation

19.21.33 The above assessment included committed development as it is not possible to assess the Proposed Scheme without the committed developments. The assessment has demonstrated that with the proposed mitigation, the network is expected to see moderate beneficial effects which is significant and minor beneficial and adverse effects which are not significant. The proposed beneficial mitigation will be further enhanced by the NMU Provision (See **Sustainable Transport Strategy** (STS) Document Reference: 4.02.00).

19.22 Summary of Effects

19.22.1 The summary of the significant effects resulting from the Construction and Operational phases of the Proposed Scheme are presented within the tables overleaf.

Table 19-77 Summary of Transportation Effects – Construction Phase

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short Term / Medium Term / Long Term)	Summary of Mitigation
Severance	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, Closure of Ringland Lane with diversion of Non-Motorised User to the Broadway.
Driver Delay	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, Temporary Traffic Management measures, temporary haul roads within the site.
Pedestrian and Cyclist Delay	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, Diversion of Non-Motorised Users, advisory signage on approach routes.
Pedestrian and Cyclist Amenity	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, Public Rights of Way closures and diversions to prevent conflicts of Non-Motorised Users with construction vehicles.
Fear and Intimidation	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, Diversion of Non-Motorised Users, advisory signage on approach routes.
Accidents and Safety	Minor	Adverse	Temporary	Direct	Medium Term	CEMP, localised widening of Marl Hill Road and temporary haul roads within the site to minimise conflicts, advisory signage on approach routes.
Hazardous / abnormal Load	N/A	N/A	Temporary	Direct	Short Term	Specific permission and notifications would be made to the Local Highway Authority (LHA), Norfolk Constabulary and National Highways. Details of the access routing, timings and number of abnormal load movements would be discussed and agreed with the CPA

Key: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N / A = Not Applicable, CEMP = Construction Environmental Management Plan.

Table 19-78 Summary of Residual Transportation Effects – Construction Phase

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short Term / Medium Term / Long Term)
Severance	Negligible To Minor	Adverse	Temporary	Direct	Medium Term
Driver Delay	Negligible To Minor	Adverse	Temporary	Direct	Medium Term
Pedestrian and Cyclist Delay	Negligible To Minor	Adverse	Temporary	Direct	Medium Term

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short Term / Medium Term / Long Term)
Pedestrian and Cyclist Amenity	Negligible To Minor	Adverse	Temporary	Direct	Medium Term
Fear and Intimidation	Negligible To Minor	Adverse	Temporary	Direct	Medium Term
Accidents and Safety	Negligible To Minor	Adverse	Temporary	Direct	Medium Term
Hazardous / abnormal Load	N/A	Adverse	Temporary	Direct	Short Term

Key: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N / A = Not Applicable, CEMP = Construction Environmental Management Plan.

Table 19-79 Summary of Transportation Effects – Operation Phase (2029)

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short Term / Medium Term / Long Term)	Summary of Mitigation
Severance	Moderate	Beneficial	Permanent	Direct	Long Term	No mitigation required - Beneficial effects due to the inclusion of NMU Provision (See **Sustainable Transport Strategy** (STS) Document Reference: 4.02.00).
Driver Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation
Pedestrian and Cyclist Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation
Pedestrian and Cyclist Amenity	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation.
Fear and Intimidation	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term	Negligible effects do not require mitigation.
Accidents and Safety	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term	Negligible effects do not require mitigation.

Key: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N / A = Not Applicable, CTMP = Construction Traffic Management Plan.

Table 19-80 Summary of Residual Transportation Effects – Operation Phase (2029)

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short Term / Medium Term / Long Term)
Severance	Moderate	Beneficial	Permanent	Direct	Long Term
Driver Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Pedestrian and Cyclist Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Pedestrian and Cyclist Amenity	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Fear and Intimidation	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term
Accidents and Safety	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term
Hazardous / abnormal Load	N/A	N/A	N/A	N/A	N/A

Table 19-81 Summary of Transportation Effects – Operation Phase (2044)

Description of Likely Significant Effects	(Major, Moderate, Minor, Negligible)	Adverse / Beneficial	(Permanent / Temporary)	(Direct / Indirect)	(Short / Medium / Long Term)	Summary of Mitigation
Severance	Moderate	Beneficial	Permanent	Direct	Long Term	Beneficial effects do not require mitigation.
Driver Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation
Pedestrian and Cyclist Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation
Pedestrian and Cyclist Amenity	Minor	Adverse / Beneficial	Permanent	Direct	Long Term	Minor effects not considered to require mitigation
Fear and Intimidation	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term	Negligible effects do not require mitigation.
Accidents and Safety	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term	Negligible effects do not require mitigation.
Abnormal Load	N/A	N/A	N/A	N/A	N/A	N/A

Key: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N / A = Not Applicable, CTMP = Construction Traffic Management Plan.

Table 19-82 Summary of Residual Transportation Effects – Operation Phase (2044)

Description of Likely Significant Effects	**(Major, Moderate, Minor, Negligible)**	**Adverse / Beneficial**	**(Permanent / Temporary)**	**(Direct / Indirect)**	**(Short Term / Medium Term / Long Term)**
Severance	Moderate	Beneficial	Permanent	Direct	Long Term
Driver Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Pedestrian and Cyclist Delay	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Pedestrian and Cyclist Amenity	Minor	Adverse / Beneficial	Permanent	Direct	Long Term
Fear and Intimidation	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term
Accidents and Safety	Negligible	Adverse / Beneficial	Permanent	Direct	Long Term
Hazardous / abnormal Load	N/A	N/A	N/A	N/A	N/A

Conclusions of significance Evaluation

19.23 Summary of Baseline and Policy

19.23.1 The assessment of traffic and transport considers potential effects of the Proposed Scheme on users of the local transport network in the immediate vicinity. The results of the assessment are presented by comparing the future situation with the Proposed Scheme in place against a future baseline without it.

19.23.2 The Proposed Scheme responds to recent transport policy requirements and includes provision for pedestrians, cyclists and horse riders, such as new green bridges crossing the highway and new sections of PRoW which join up and enhance the existing network and connect with National Highways Improvement Scheme Proposals.

19.23.3 The baseline studies for traffic and transportation considered the current state of the road network for pedestrians, cyclists and drivers and travel by public transport. It also considered local public rights of way and other routes used by pedestrians, cyclists and horse riders. The studies showed that the existing network is not currently well used by these types of users. The existing highway network is also significantly constrained in terms of highway geometry as set out within the **Transport Assessment** (Document Reference: 4.01.00) and the Do Minimum Scenario is characterised by increased traffic on minor rural roads that are not designed to cater for strategic traffic movements. This makes them less attractive for active travel.

19.24 Summary of Construction effects

19.24.1 The construction assessment found there will be a temporary increase in HGV traffic during the construction period. HGV movements will generally be for the delivery of plant and materials and the removal of construction waste. Site workers and visitors will also generate traffic movements. The works will be carried out in phases, construction traffic will be contained within the site with internal haul roads where possible to minimise movement on

existing rural roads. Beyond the Red Line Boundary appropriate traffic management measures will be put in place for safe construction access and to protect members of the public. The assessment found that, taking into account the measures recommended for inclusion in the CEMP to manage and monitor construction traffic associated with the Proposed Scheme, there would be no significant adverse effects to traffic and transportation.

19.25 Summary of Operation effects

19.25.1 The Proposed Scheme is not expected to generate new trips on the network but rather result in the redistribution of vehicle journeys. This means some routes could receive an uplift in traffic, while others receive a corresponding reduction and beneficial traffic relief. The assessment found that in the opening year (2029) and in the future assessment year (2044), taking into account the proposed mitigation, there would be no significant adverse effects to traffic and transportation. As set out within the **Transport Assessment** (Document Reference: 4.01.00), the Proposed Scheme will also provide a more suitable route for strategic traffic and HGV movement that helps to offer resilience to the local highway network and future proofing.

19.25.2 As part of the overall Transport for Norwich Strategy, the Proposed Scheme will assist in delivering a sustainable transport solution across the city. With traffic relief on rural minor roads as a result of the new links, there is also an opportunity to introduce additional Complementary Sustainable Transport Measures as explained in the **Sustainable Transport Strategy** for the Proposed scheme (Document Reference: 4.02.00). The transport benefits are also explained in Chapter 4 of the **Transport Assessment** (Document Reference 4.01.00).

19.26 References

Ref 1 - National Planning Policy Framework (NPPF) 2021

Ref 2 - National Planning Practice Guidance (PPG, 2014)

Ref 3 - Department for Transport Circular (2022)

Ref 4 - Cycle Infrastructure Design Local Transport Note LTN 1 / 20 (2020)

Ref 5 - Gear Change: A Bold Vision for Walking & Cycling (2020)

Ref 6 - Decarbonising Transport: A Better, Greener Britain (Department for Transport, 2021)

Ref 7 - Norfolk Strategic Framework: Shared Spatial Objectives for a Growing County (2017)

Ref 8 - Transport for Norwich (TfN) Strategy (2021)

Ref 9 - Norfolk County Council Environmental Policy (2019)

Ref 10 - Broadland District Council (BDC) Local Plan (Adopted 2016)

Ref 11 - South Norfolk District Local Plan (Adopted 2011)

Ref 12 - Breckland District Council Local Plan (2019)

Ref 13 - The Greater Norwich Local Plan (2024)

Ref 14 - Local Cycling and Walking Infrastructure Plan (2022)

Ref 15 - The Guidelines for the Environmental Assessment of Road Traffic by Institute of Environmental Management and Assessment (IEMA) 2023

Ref 16 - Design Manual for Road and Bridges (DMRB) (DfT 2022).

Ref 17 – New Roads and Street Works Act (NRSWA) 1991

Ref 18 – Transport Research Laboratory (TRL SR356, Goldschmidt, 1976)

Ref 19 – Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021)

Ref 20 – Pedestrian Comfort Guidance for London (2019) by Transport for London (TfL)

Ref 21 – International Road Assessment Programme (iRAP)

Ref 22 – Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Statutory Instrument 2017 No. 571