

North Walsham Western Urban Extension





DRAFT Transport Assessment

ESCO Developments Limited, Lovell Partnerships Limited,
Flagship Housing Group

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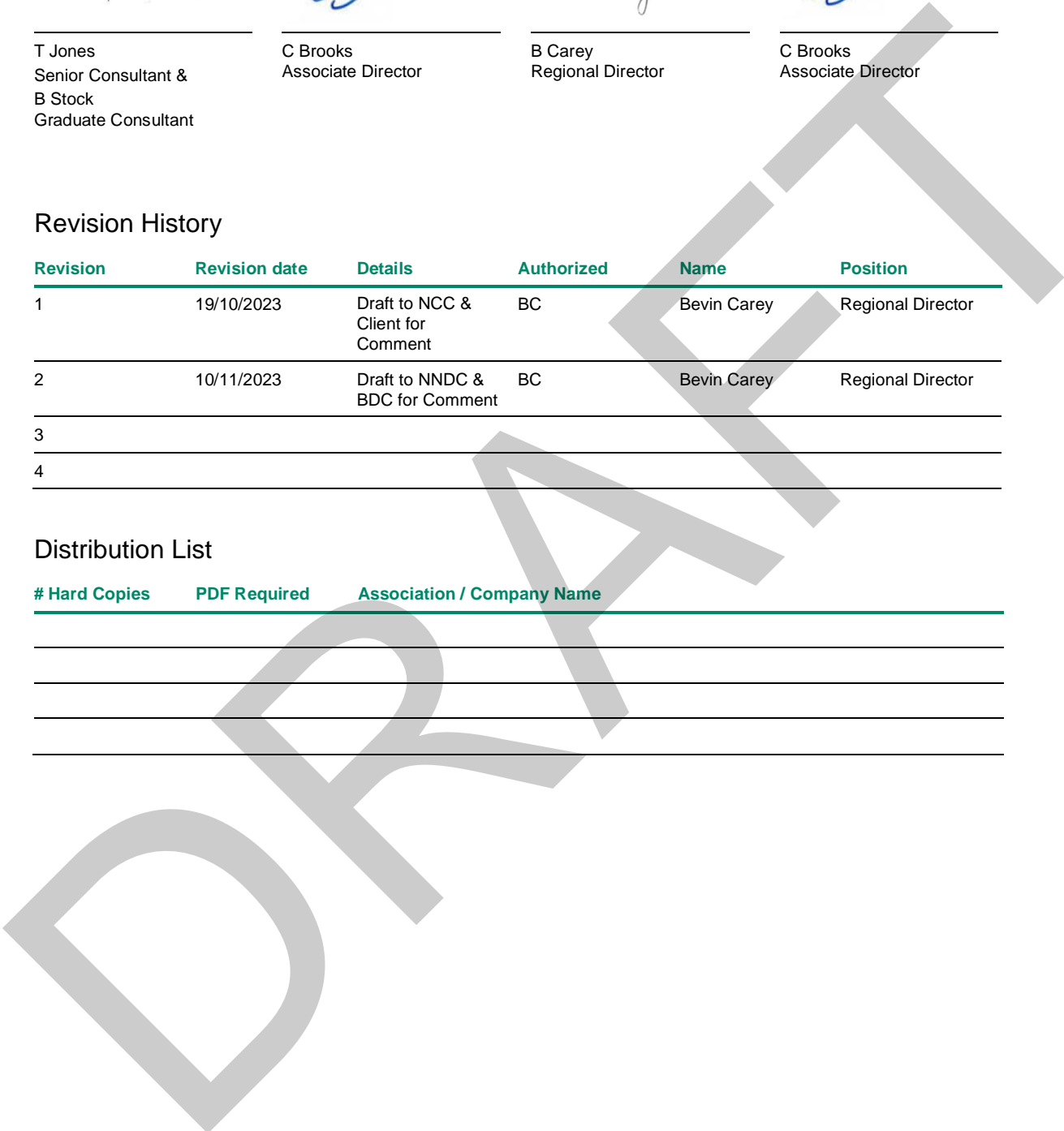
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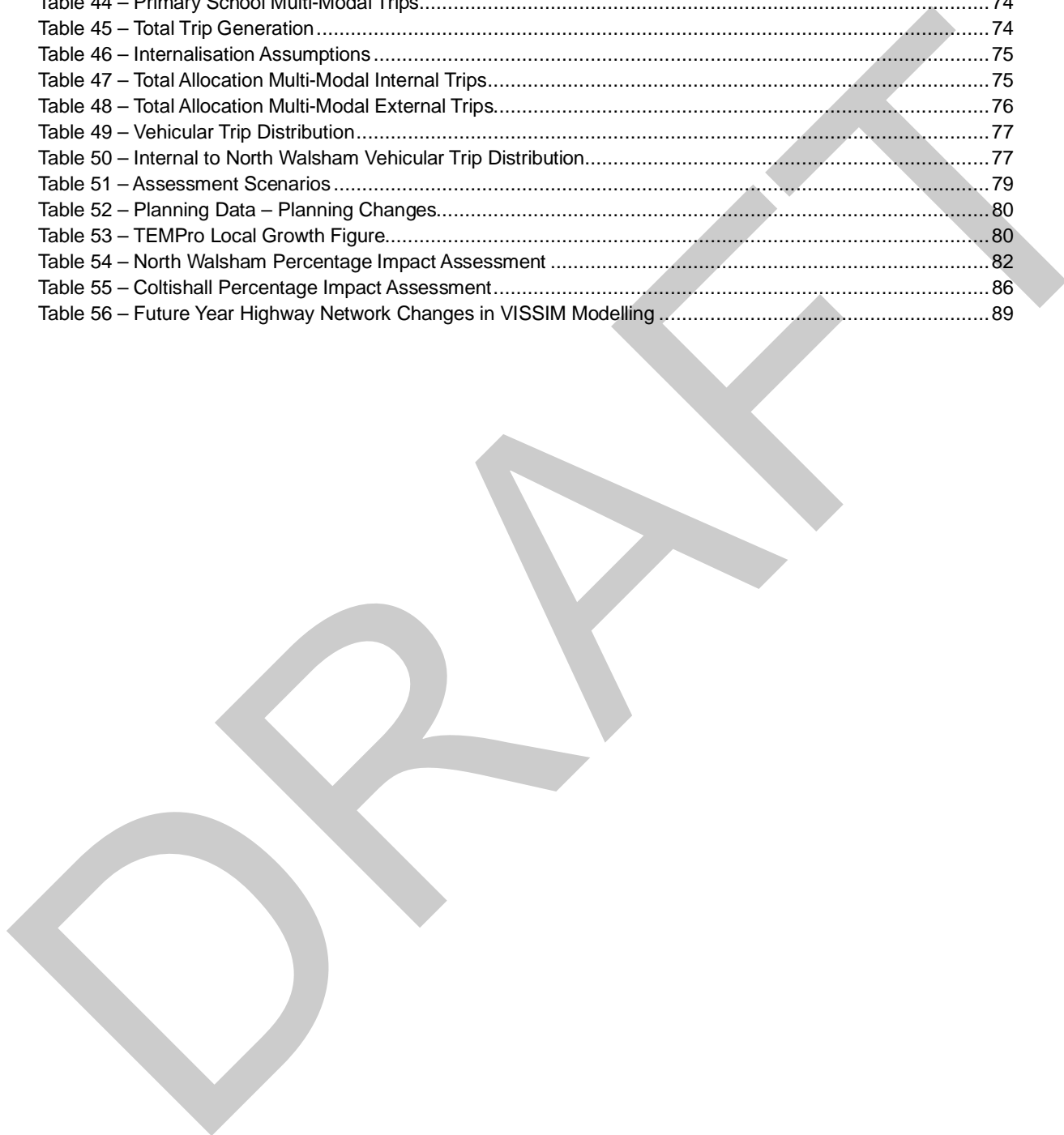
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1. Introduction

Introduction

- 1.1 AECOM has been appointed by ESCO Developments, Lovell Partnerships, and Flagship Housing Group hereby referred to as the 'Client Consortium' to provide transport planning advice to accompany a land allocation submission for the provision of a mixed-use development on land to the west of North Walsham, Norfolk for the North Norfolk District Council (NNDC) Local Plan 2016-2036.
- 1.2 The allocation, identified in the Regulation 19 version of the NNDC Local Plan 2016-2036 as 'Land West of North Walsham (NW62/A)', is expected to deliver:
 - Approximately 1,800 dwellings.
 - 7ha of serviced employment land.
 - Green infrastructure.
 - Community facilities, including a new primary school.
 - A road linking Norwich Road, Cromer Road, and the industrial estate.
 - Other required infrastructure, improvements and mitigation including, but not limited to, health services, drainage, and power.
- 1.3 The allocation is located on the western side of North Walsham as shown in **Figure 1** and is approximately 1.1km to 1.6km from the town centre and 600m to 1.6km from the train station.

Figure 1 – Allocation Location



- 1.4 Generally, the allocation comprises of agricultural land with a small amount of former industrial land in the most northerly section where the railway line bisects the allocation land. As the allocation runs in a north-south direction, several roads bisect the allocation including A149 Cromer Road, Bradfield Road, B1145 Aylsham Road, and Skeyton Road whilst the B1150 Norwich Road forms the south-eastern boundary.
- 1.5 The allocation is bounded by residential developments to the east, whilst the north, south, and west is bounded predominantly by agricultural land. There are also a variety of leisure, commercial, and industrial uses scattered through and adjacent to the allocation.

Assessment of Allocation

- 1.6 Whilst the development proposals are not yet at planning application stage, a Transport Assessment (TA) has been prepared to inform the Regulation 19 submission of the NNDC Local Plan 2016-2036 of the impacts of the allocation in terms of transport on the sustainable transport and highway networks, and how those impacts can be addressed. This TA has been prepared in accordance with the Government's Planning Practice Guidance on the Planning Portal as well as extensive scoping discussions with Norfolk County Council (NCC), as highway authority.
- 1.7 The scope of the assessment and findings of the assessment have been developed in parallel with regular discussions with NCC as the highway authority. This has included consultation with the Public Rights of Way (PRoW) and Local Cycling and Walking Infrastructure Plan (LCWIP) teams to discuss the masterplan for the development its impact on the existing and future sustainable transport network within North Walsham. A site visit and discussions have also been carried out with NCC's Road Safety Team to discuss potential improvements on the external sustainable and highway networks which have subsequently been audited by the team for compliance with Design Manual for Roads and Bridges (DMRB) Road Safety Audit (RSA) guidance.
- 1.8 In addition, two public consultation events, relating to a Development Brief for the proposed allocation site, as well as briefings with Council members at both NNDC and Broadland District Council (BDC) have been undertaken. The feedback from each of the events has been reviewed and taken into consideration as appropriate within the TA for this stage in the planning process.
- 1.9 This TA focuses on the existing transport situation for all modes, the allocation proposals, and the transport impact of the allocation. The aim of this report is to assess the allocation's impact on the surrounding sustainable transport and highway network and where necessary identify how those impacts can be mitigated.
- 1.10 Although the allocation is in North Walsham, it was made clear during scoping discussions that the impact of the allocation would also need to be assessed within Coltishall and Horstead which sit within the BDC area.
- 1.11 Previous modelling had been carried out by NCC in North Walsham using SATURN. However, this was not considered appropriate to be reutilised for this assessment as it did not provide the level of detail required, was not based on up-to-date traffic data, nor did it cover the full area to be assessed. It was therefore agreed that it would be most appropriate to assess impacts using a VISSIM microsimulation model for North Walsham and a separate model for Coltishall. The VISSIM models would provide sufficient evidence at the level of detail required for the assessment on how the existing and future highway network would operate without and with the allocation in place. Further detail relating to this is provided in the TA.

Structure of Report

- 1.12 The remainder of this TA is structured as follows:
- **Chapter Two** provides a review of the national and local policies of relevance to the allocation.
 - **Chapter Three** sets out the existing transport conditions, accessibility, and a review of the highway network for North Walsham, as well as a review of the highway network in Coltishall.
 - **Chapter Four** sets out the proposals for the allocation.
 - **Chapter Five** sets out the sustainable transport strategy for the allocation which examines the existing conditions and identifies proposed improvements.
 - **Chapter Six** sets out the access strategy for the allocation for both sustainable modes and vehicular access.
 - **Chapter Seven** sets out the multi modal trip generation for the allocation, and the vehicular trip distribution.
 - **Chapter Eight** sets out the highway network scope and allocation impact on the highway network.
 - **Chapter Nine** sets out the highway network assessment.

- **Chapter Ten** sets out a summary of the mitigation proposals.
- **Chapter Eleven** sets out construction traffic management requirements.
- **Chapter Twelve** provides a summary and conclusion for the report.

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2. Policy

Introduction

- 2.1 This section reviews the relevant policy and guidance for this TA, in the context of the allocation.

National Policy

National Planning Policy Framework (2023)

- 2.2 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.
- 2.3 At the heart of the framework is a presumption in favour of sustainable development. This means that plans need to seek opportunities to meet the development needs of their area and be sufficiently flexible to adapt to rapid change. Sustainable development must contribute to the economic, social, and environmental aspects of a community.
- 2.4 The use of sustainable transport modes for the movement of goods and people is widely encouraged. Sustainable transport modes are defined in the NPPF as 'Any efficient, safe and accessible means of transport with overall low impact on the environment, including walking and cycling, ultra-low and zero-emission vehicles, car sharing and public transport'.
- 2.5 Section 9 of the NPPF entitled 'Promoting Sustainable Transport' outlines the transport considerations for plan-making and development proposals. Paragraphs of relevance include:
- Paragraph 104 - outlines how transport issues should be considered in plan-making.
 - Paragraphs 105-109 - outline how planning policy should encourage sustainable travel.
 - Paragraph 110 - outlines the key considerations when allocating sites.
 - Paragraphs 111-112 - outline the transport considerations for developments.
 - Paragraph 113 - outlines when a TA, Travel Plan (TP) or Transport Statement (TS) are required.

National Planning Practice Guidance (2014)

- 2.6 The Government has undertaken a review of the planning guidance that supports the delivery of the NPPF and published an updated National Planning Practice Guidance (NPPG) online at <http://planningguidance.planningportal.gov.uk/>. The updated planning practice guidance includes guidance on TPs, TAs, and TSs.
- 2.7 The Planning Practice Guidance on TPs, TAs, and TSs sets out:
- When TPs, TAs, and TSs are required.
 - How the scope of the plans and assessment should be defined.
 - What should be included within the documents.
- 2.8 The allocation is compliant with the NPPF and the NPPG as it is conveniently located in terms of essential facilities which can be accessed by sustainable modes of transport, minimising the need to travel by car. This TA has been prepared in accordance with the guidance set out in NPPG.

Local Policy

North Norfolk Local Plan 2008-2021

- 2.9 The existing NNDC Local Plan guides development decisions up to 2021, however, NNDC have submitted a new Local Plan to the Planning Inspectorate for consideration and approval.

Core Strategy

2.10 The core strategy document sets out the key elements of the planning framework for North Norfolk that will be used for planning proposals, covering the period up to 2021. It provides the overarching approach to development in the district.

2.11 The relevant core aims that will aim to achieve the overall strategy of the Local Plan are outlined as follows:

- Core Aim 2: To provide for sustainable development and mitigate and adapt to climate change.

This aim will be achieved by concentrating development in the settlements that have the greatest potential to become more self-contained and strengthen their role as centres for employment, retail, and services. The allocation is suitably located in North Walsham and delivery of a large-scale urban extension creates the opportunity to provide development which is sustainably connected to existing and future facilities, and which can deliver meaningful infrastructure needed to support the growth. The increase in population will support the growth of local businesses.

- Core Aim 6: To improve access for all jobs, services, leisure, and cultural activities.

This aim will be achieved by protecting and improving existing infrastructure, and to improve access to key services by public transport and facilitate increased walking and cycling. This allocation will improve access to key services by public transport by promoting bus-based travel, with the provision of bus stops and a transport hub within the allocation. Walking and cycling access to jobs and facilities will be facilitated through the sustainable transport strategy outlined within this TA.

2.12 The relevant policies that will achieve the core aims set out above that are related to transport and access for this site from the North Norfolk Local Plan 2008-2021 are as follows:

- Policy CT 5: The Transport Impact of New Development

The allocation will be designed to reduce the need to travel and promote and maximise the use of sustainable modes of transport to reduce the transport impact of the allocation in terms of highways. Off-site mitigation will be identified to improve both the sustainable transport network and the highway network.

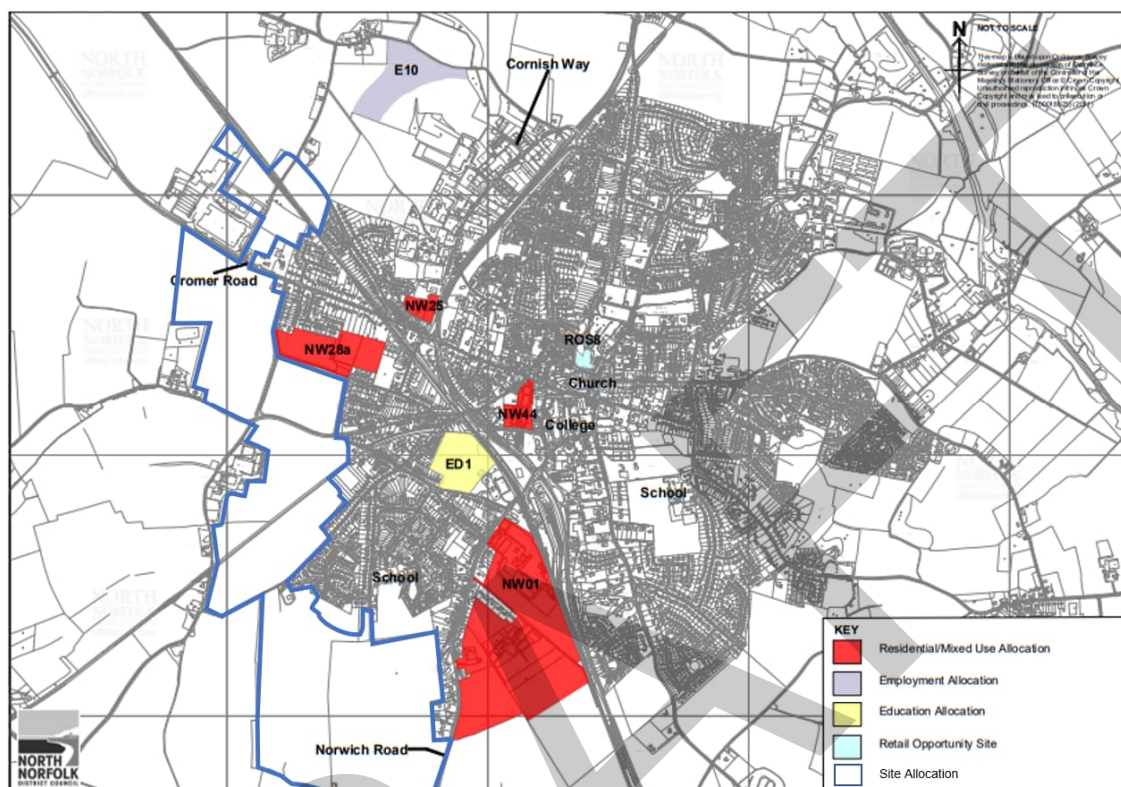
- Policy CT 6: Parking Provision

Adequate vehicle parking facilities will be provided by developers to serve the allocation, in line with NCC parking standards at the time of a planning application.

Site Allocations

- 2.13 The site allocation map for the current Local Plan is shown in **Figure 2** below.

Figure 2 – Current Local Plan Site Allocation Policy Map (© NNDC)



- 2.14 The blue line identified in the figure above represents the boundary of the allocation. This confirms that there are no existing Local Plan allocations within the boundary.

Proposed North Norfolk Local Plan 2016-2036

- 2.15 NNDC have submitted a new Local Plan to the Planning Inspectorate for consideration and approval. This will guide development decisions in North Norfolk up to 2036. The plan details where new developments will be created to meet the needs of the district, with this development forming an allocated site in the new Local Plan.

Local Plan Proposed Submission Version

- 2.16 The relevant policies relating to transport and access for this site from the Proposed North Norfolk Local Plan 2016-2036 (Regulation 19) are as follows:

- Policy CC 1: Delivering Climate Resilient Sustainable Growth

Policy CC 1 sets out the guiding principles that all development proposals should address to ensure that any new development positively contributes to sustainable growth and mitigating and adapting to climate change to address the challenges that are most relevant for North Norfolk.

This suggests that large-scale developments, like the allocation should facilitate sustainable transport options through careful design and a balanced mix of uses that promote and support walking and cycling, as well as public transport. This is proposed through the sustainable transport strategy for the allocation.

- Policy CC 8: Electric Vehicle Charging

Policy CC 8 sets out that in developments where vehicle parking is proposed, it must include appropriate provision for electric vehicle charging points. For major developments, details of how the required electric vehicle charging points will be allocated, located, and managed, including the mechanism/procedure for taking payments must be detailed in the TA. As the allocation comes forward electric vehicle charging points will be provided in accordance with the requirements of the NCC Parking Standards applicable at the time.

- Policy CC 9: Sustainable Transport

Policy CC 9 sets out that developments will be well located and designed to minimise the need to travel and to maximise the use of sustainable transport and active travel for its location. The policy outlines that new developments must provide safe and convenient pedestrian and cycling facilities, suitable access to the highway network and the traffic generated by the development must not have a detrimental impact on the existing road network. If a development will generate significant traffic movements, then the proposal must be accompanied by a TP. As the allocation moves to a planning application, a TP will be provided.

- Policy HC 7: Parking Provision

Policy HC 7 sets out that developments will need to provide adequate, safe, and secure vehicle and cycle parking facilities and must be in accordance with the latest NCC Parking Standards.

- Policy NW62/A: Land West of North Walsham

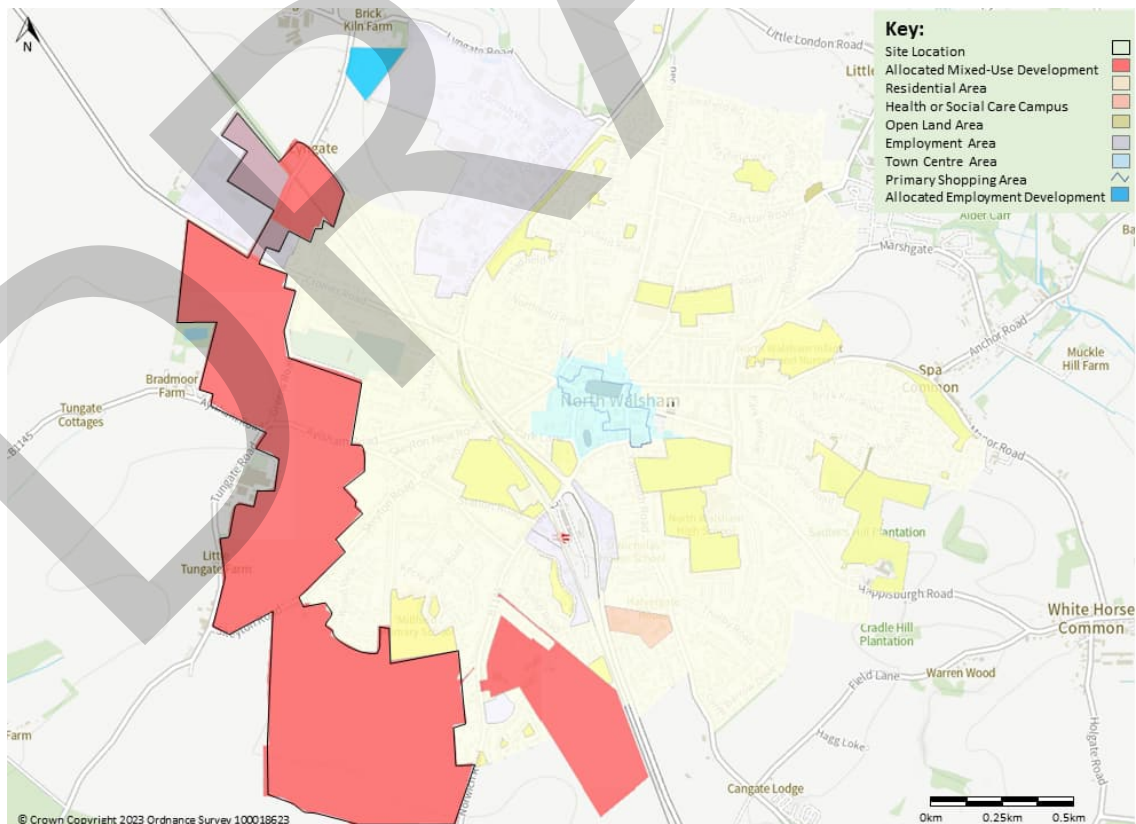
Policy NW62/A, Land West of North Walsham, covers the allocation for which this TA has been prepared. The policy identifies that the site composition should include for approximately 1,800 dwellings, seven hectares of employment land, green infrastructure, community facilities (including a primary school), and a road linking Norwich Road, Cromer Road, and the industrial estate.

2.17 Any development proposals must explore the benefits of the western link road and the impacts (and any mitigation required) on the surrounding road network including the route to Norwich via Coltishall, as well as including an assessment of the walking and cycling routes and a strategy to promote active travel and public transport. This TA has been prepared to assess the allocation in line with the requirements of the policy.

Policies Map

2.18 The site allocation policy map for North Walsham is included in **Figure 3** below.

Figure 3 – New Local Plan Site Allocation Policy Map (© NNDC)



2.19 Policy NW62/A states the following:

- Land to the west of North Walsham to provide a mixed-use sustainable urban extension amounting to 108 hectares, as defined on the Policies Map, is allocated for approximately 1,800 dwellings, seven hectares of employment land, green infrastructure, community facilities and a road linking Norwich Road, Cromer Road, and the industrial estate.
- Planning permission will be granted subject to compliance with the relevant policies of this Plan and the following site-specific requirements:
 4. Enhancement of the Weavers Way corridor acting as a green access spine through the development including improving biodiversity along the corridor. It will provide a pedestrian and cycle crossing point across the link road that prioritises these uses over vehicle traffic;
 8. Provision of a network of interconnected streets, squares, green corridors, and public spaces which prioritise moving around on foot and by cycle over the use of private motor vehicles;
 9. Delivery of appropriate public transport measures on site providing facilities and regular services to/from the town and key services;
 10. Provision of off-site pedestrian and cycle route improvements to the town centre, key services, and railway station;
 11. Delivery of a new road designed as an attractive main residential street through the development with mixed-use frontage usages and segregated cycle paths and footways. This new road should be suitable for HGV traffic (including high sided vehicles) and will connect Norwich Road to Cromer Road and provide a suitable route over the railway for access to the Lyngate/Folgate Rd industrial estate together with appropriate junctions. It should be delivered, in full, at the earliest opportunity;
 12. Off-site improvements to the highways and transport network including key junctions that require intervention and mitigation;
 13. Delivery of appropriate restrictions on the amount of private traffic (including HGV vehicles) that can travel along the Aylsham Road and Skeyton Road.

2.20 Where possible these policy requirements are being incorporated into the Design Brief and emerging site proposals. Where measures are not included, justification is provided, specifically about the provision of a route over the railway to the Lyngate / Folgate Rd industrial estate.

Safe, Sustainable Development (2019)

2.21 The 'Safe, Sustainable Development' document is a set of aims and guidance notes provided by NCC that are intended to act as best practice for developers. The aims that are relevant to the allocation are set out in the following bullet points.

- Aim 1: (Transport Sustainability). Minimising travel to ensure people can access facilities they need by appropriate transport modes, encouraging walking, cycling and public transport use and reducing the use of private cars especially for shorter journeys.

The allocation will provide a comprehensive level of facilities to encourage travel by sustainable modes of transport, as well as enhance existing facilities located within the allocation and the wider area connecting to the town centre, employment areas, education, and public transport infrastructure. On-site walking and cycling infrastructure will be LTN 1/20 compliant. A TP will also be prepared for the allocation at the application stage which will further promote sustainable and active travel and discourage the use of the private car.

- Aim 2: To encourage residents to explore active and healthier ways of travel.

This will be facilitated through the promotion of the Weavers' Way route as an attractive leisure facility for pedestrians and cyclists. The allocation will also connect to North Walsham's existing infrastructure to enable residents to walk and cycle more easily around the town. Existing routes and routes within the allocation will follow natural desire lines where possible, with the infrastructure being attractive and comfortable to use.

- Aim 5: To keep commercial vehicles away from areas where their presence would result in danger/unacceptable disruption to the highway/or cause irreparable damage.

The link road through the allocation will enable HGVs to navigate North Walsham more easily, without using the residential streets in the southeast of the town, which are not designed to accommodate regular HGV movements. The link road will be designed to accommodate the expected increase in HGV movements along the road.

- Aim 6: To ensure development conforms to parking policies and standards which consider strategic and local objectives.

Parking provision will be provided in accordance with the NCC parking standards applicable at the time of the outline planning application and each subsequent Reserved Matters application.

- Aim 8: New development within Norfolk of regional/national importance shall promote the use of rail and water.

It is a requirement that new development should be located to provide good access to rail/water facilities. The allocation is located within walking distance of the train station. Water travel is not appropriate for this allocation.

Transport Policy

Local Transport Plan 4 (2021)

2.22 The Local Transport Plan 4 was adopted by NCC in July 2022. The Plan describes NCC's strategy and policy framework delivery up to 2036.

2.23 The key issues identified include how NCC will achieve the policy aim to work towards carbon neutrality by 2030 as agreed in the environmental policy adopted by the county council; improve air quality in urban areas; meet the challenge of technology and innovation in the transport system and the ways in which people work; and support the economy of the county by ensuring that people can make the connections they need.

2.24 The document is used as a guide for transport investment and considered by other agencies when determining planning or delivery decisions. It identifies seven objectives for transport:

- Embracing the Future.
- Delivering a sustainable Norfolk.
- Enhancing connectivity.
- Enhancing Norfolk's Quality of Life.
- Increasing accessibility.
- Improving transport safety.
- A well-managed and maintained transport network.

2.25 To achieve the objectives above, a set of policies have been created. Those policies within the Local Transport Plan relevant to the allocation are outlined below:

- Policy 2: The priority for reducing emissions will be to support a shift to more sustainable modes and more efficient vehicles.

This will be achieved through the promotion of sustainable transport facilities and connections, as well as providing sustainable transport infrastructure within the allocation and providing off-site works to increase the use of sustainable modes for journeys within the allocation and around North Walsham and the wider area.

- Policy 5: Ensure that new developments are well connected to maximise the use of sustainable and active transport options.

The allocation is located on the western edge of North Walsham and is within reasonable walking and cycling distances of local facilities and amenities, as well as the provision of excellent on-site facilities and enhanced off-site connections. The allocation is well-connected to the existing bus network, however, will be provided within new bus stops and a transport hub to further enhance access and travel by sustainable modes of transport.

- 2.26 The allocation is in accordance with the policies as set out in the document through its increasing accessibility and improving transport safety objectives. The Weavers' Way and the other PRoW that are encompassed and adjacent to the development site will act as green access spines, providing active travel access. The allocation will also provide off-site pedestrian and cycle route improvements to key amenities, including the town centre and train station. Regarding the highway network, the new link road will facilitate HGV traffic over the railway for access to the industrial estates in the north of the town.

Local Cycling and Walking Infrastructure Plan

- 2.27 LCWIPs are developed to identify and prioritise improvement schemes over short, medium, and long periods of time. LCWIPs are designed to play an important role in achieving the aim that half of all journeys by 2030 in towns and cities will be cycled or walked, with walking and cycling being the first natural choice.
- 2.28 NCC received funding of almost £1 million from Active Travel England (ATE) in January 2023 to encourage active travel. Of the £1 million, a grant of £319,871 has been designated for developing a county-wide LCWIP. NCC have already developed LCWIPs for the Greater Norwich area, Great Yarmouth, and King's Lynn.
- 2.29 The LCWIP will set out schemes of improvements that could be made to local walking and cycling infrastructure, including North Walsham. Consultations on the proposed schemes are in process. However, the funding for the LCWIP will not fund the schemes themselves; instead, the funding is used to develop the LCWIP. No details are available on potential improvements for North Walsham currently as consultation feedback review by NCC is still ongoing. Details are due to be made available in early 2024.

Active Travel England

- 2.30 Active Travel England is the government's executive agency responsible for making walking, wheeling, and cycling the preferred choice for everyone to get around in England.
- 2.31 The second cycling and walking investment strategy (CWIS2) outlines the government's ambition to make cycling and walking the natural choices for shorter journeys, or as part of a longer journey by 2040.
- 2.32 The aims and targets in the first strategy, alongside the vision set out in Gear change (2020), have informed their objectives, which are:
- Increase the percentage of short journeys in towns and cities that are walked or cycled;
 - Increase walking;
 - Double cycling; and
 - Increase the percentage of children aged 5 to 10 who usually walk to school.
- 2.33 The allocation will provide good quality walking and cycling routes across the site to enable people to travel to their destinations on foot or by cycle safely and conveniently.

Transport East Transport Strategy 2023-2050

- 2.34 Transport East as the sub national transport body for Norfolk, Suffolk, Essex, Southend-on-Sea, and Thurrock brings together councils, business leaders and the Government to identify the transport investment needed to support sustainable economic growth in the region and improve people's quality of life. The priorities of Transport East are:
- Creating a net zero carbon transport network
 - Connecting our growing towns and cities
 - Energising our coastal and rural communities
 - Unlocking our global gateways.
- 2.35 Transport East will guide investment across the region to support these priorities. Of relevance to North Walsham are the Goals which Transport East are looking to deliver in partnership with stakeholders for this region:
- Goal 1: Reduce demand for carbon intensive trips through local living; making it easier for people to access jobs and services locally or by digital means;

- Goal 2: Shift modes by supporting people to switch from private car to active and passenger transport, and goods to more sustainable modes like rail;
- Goal 3: Switch fuels with all private, passenger transport, fleet and freight vehicles switching to net zero carbon fuels at the earliest opportunity;
- Goal 4: Zero carbon growth by supporting authorities and developers to plan, locate and design new development that reduces the need for people to make carbon-intensive trips;
- Goal 5: Improve connections and access within our urban centres through better walking, cycling and passenger transport, supporting sustainable access to services, education, training, jobs, and leisure;
- Goal 6: Deliver faster and more reliable connections between our growing places and to the rest of the UK, to support business growth, skills development, and employment;
- Goal 7: Fully integrate transport networks, services, and operations across the Transport East region, through a customer-focused approach, enabling seamless and safe end-to-end journeys by sustainable modes that are attractive to all;
- Goal 8: Increase accessibility for rural communities to education, training, services, and jobs through; better ways of taking people to places sustainably, supporting more local trips through closer provision of goods and services, supporting regional partners and the digital sector to provide alternative options to travel.

2.36 The proposed allocation of a large-scale urban extension in North Walsham which is designed with sustainable travel as a guiding principle will support delivery of these goals and will also benefit from the initiatives being delivered by Transport East to achieve these aims, such as supporting the development and growth of the rail and broadband, and rural public transport networks.

Summary

2.37 In transport terms, the allocation accords with the policies set out above due to its sustainable location which provides an attractive location for residents of North Walsham and the surrounding area to travel to for employment and other purposes, as well as being well-located for those residing at the allocation to reach the amenities and facilities within North Walsham. The mixed-use nature of the allocation will also encourage trips between the uses such that, for example, trips at lunchtime or between residences and the school and local centre can be contained within the allocation and made by sustainable modes rather than have an impact on the surrounding highway network.

3. Existing Conditions

Introduction

- 3.1 This chapter reviews the accessibility of the allocation for all modes of transport. It provides a description of the allocation site and its location along with a review of the existing walking, cycling, and public transport facilities near the allocation and a description of the existing highway network.

Existing Site

- 3.2 North Walsham is a market town located in the district of North Norfolk and based on the 2021 Census has a population of 12,829. North Walsham is located approximately 24km north of Norwich and 16km southeast of Cromer.
- 3.3 The allocation is located on the western boundary of North Walsham and predominately comprises agricultural land, however, there is a small amount of former industrial land in the north of the allocation, adjacent to Bradfield Road. Undeveloped land and in part the A149 Cromer Road bound the site to the north, with residential properties and North Walsham Football Club being located along the eastern boundary. The B1150 Norwich Road bounds the site to the south and commercial uses, agricultural land, and Rossis Leisure form the western boundary. B1145 Aylsham Road and Skeyton Road both bisect the allocation in an east-to-west direction, whilst Greens Road which connects A149 and B1145 bisects the allocation in a north-to-south direction.
- 3.4 Depending on the starting point, North Walsham town centre is approximately 1.1 to 1.6km from the allocation whilst the railway station is approximately 600 metres to 1.5km from the allocation.
- 3.5 The allocation location is shown in **Figure 1** in Chapter 1.

Pedestrians

Accessibility

- 3.6 The Chartered Institute of Highways and Transport (CIHT) document 'Providing for Journeys on Foot' (2000) recommends a maximum walking distance of up to two kilometres for trips to work. **Figure 4** illustrates a 30-minute (two kilometres) walking catchment. The catchment is taken from the centre of the allocation and illustrates that the whole of North Walsham and its amenities and facilities, as well as some of the surrounding villages, are within the maximum recommended walking distance.

Figure 4 – 30-minute Walking Distance Isochrone



Source: <https://traveltime.com/>

3.7 The CIHT document discusses further the recommended walking distances to key destinations, and these are set out in **Table 1** below. It should however be noted that there are pedestrians who will travel more than the maximum distances and therefore it should be considered indicative.

Table 1 – Recommended Walking Distances to Destinations

	Town Centres	Commuting / School	Elsewhere
Desirable	200m	500m	400m
Acceptable	400m	1000m	800m
Maximum	800m	2000m	1200m

3.8 Key off-site destinations have been identified along with their walking time and distance from the closest part of the allocation. The times and routes have, where possible, been derived using Google Maps route planning software. The results have then been compared with the recommendations in **Table 1** and are set out in **Table 2**.

Table 2 – Times and Distances to Off-Site Facilities

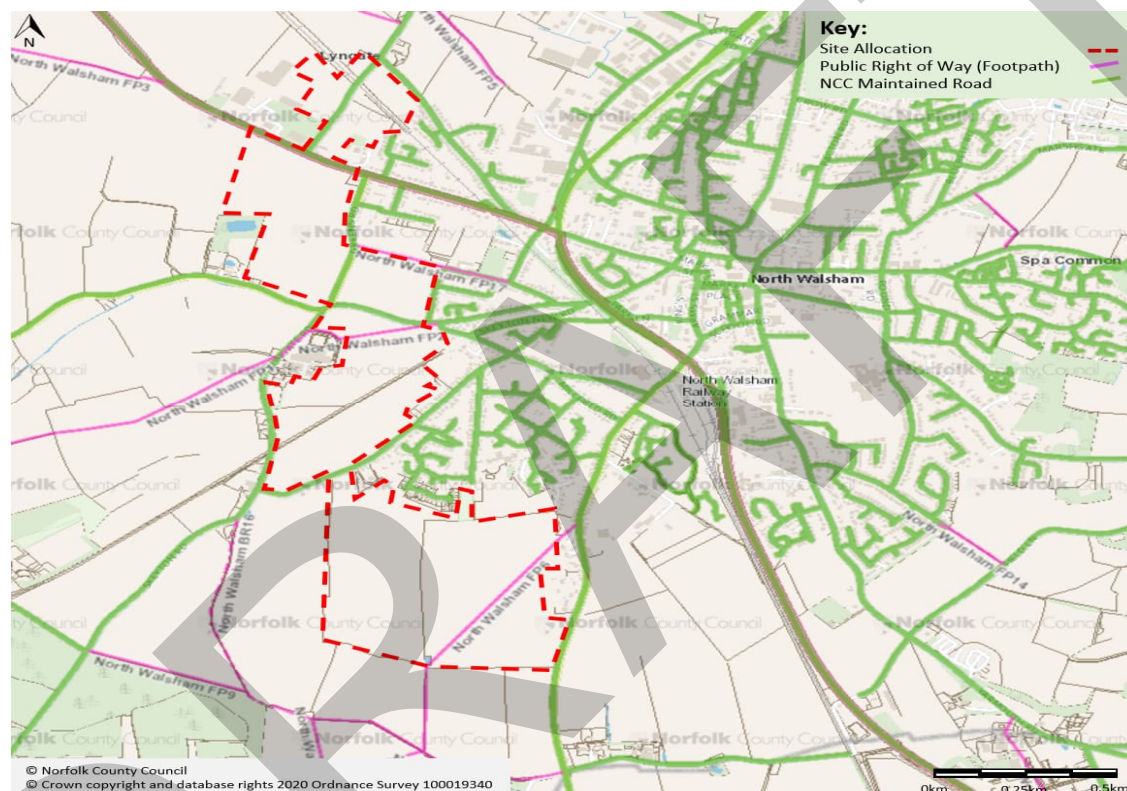
Location	Walking Distance (Kilometres) (Closest)	Recommended Desirable / Acceptable / Maximum Walking Distance	Time Walking (minutes) (Closest)
Train Station	0.7	Acceptable (commuting)	8
Travel Hub	1.2	Maximum (commuting) Acceptable (everything else)	15
Market Place (Town Centre)	1.0	Acceptable (commuting) Outside of maximum (town centre)	12
North Walsham Hospital	1.9	Preferred maximum (commuting) Outside of maximum (elsewhere)	24
North Walsham High School	1.7	Preferred maximum (school)	21
Paston College	0.85	Acceptable (maximum)	10
Folgate Road Industrial Estate	1.0	Acceptable (commuting)	13

- 3.9 This illustrates that the allocation is located within the recommended maximum walking distance of the key destinations identified and therefore would encourage trips by modes other than the private car. In addition, the distances identified by the CIHT are recommended maximums and with the provision of good facilities, travel on foot could be undertaken for greater distances for all journey purposes. Distance should not be seen as a barrier to travel.

Existing Infrastructure

- 3.10 Existing public footpaths and NCC-maintained roads around the allocation can be seen in **Figure 5**. This illustrates that there are currently many routes available for those living in or visiting the allocation connecting to places of work, education, leisure, retail, and public transport.

Figure 5 – Existing Public Footpaths and NCC Maintained Roads



- 3.11 Most roads nearest the allocation are provided with pedestrian facilities.
- 3.12 There is a footway on the northern side of the A149 Cromer Road from the town's western boundary to the junction with the A149. After this point, footways are provided along both sides of the carriageway with an underpass provided at the railway line. This footway provides connections between the allocation and the retail and employment area to the west, as well as the town centre, and Folgate Road Industrial Estate.
- 3.13 No footways are provided along the rural section of Aylsham Road; however, footways are provided east of the junction with Station Road where the surroundings become more residential in nature. Footway provision is however limited on the southern side as this stops opposite the junction with Howlett Close. The footway on the northern side is relatively wide however this also ends some 50 metres east of the junction with Howlett Close. At this point, pedestrians are required to utilise the carriageway for approximately 230 metres when the footway provision re-starts east of the junction with Cherry Tree Lane. The speed limit along this narrow section has been reduced to 20 mph, however pedestrians are still required to share the carriageway with all vehicles using Aylsham Road including high sided HGVs. There are alternative, less trafficked, routes for pedestrians travelling between Station Road and Aylsham town centre although those residing along this section of Aylsham Road are required to use this route.
- 3.14 Skeyton New Road sits along the desire line between the site, Aylsham Road, and the town centre. It provides limited dedicated facilities for pedestrians and cyclists but offers a lightly trafficked lane which runs parallel to and connects with Weavers Way. For 265m Weavers' Way provides a traffic free route, whilst the remaining 95m of Skeyton New Road provides a shared surface to connect with Aylsham Rd, immediately west of the railway bridge.

- 3.15 There is good pedestrian infrastructure along Skeyton Road within the residential area, with footways on both sides of the carriageway which continue as far as the Skeyton Road / Station Road / Oak Road crossroads. A few properties on Skeyton Road have no footway provision and are required to utilise the carriageway.
- 3.16 Pedestrian facilities are in place along the B1150 Norwich Road, from approximately 125 metres south of the Ewing Road / B1150 Norwich Road priority junction. Adjacent to the southbound carriageway to the north and south of the Ewing Road / B1150 Norwich Road priority junction, there is a shared pedestrian/cycle footway. The footway continues along B1150 Norwich Road to the B1150 Norwich Road / Norwich Road / A149 signalised junction and into the town centre.
- 3.17 There are currently no committed development schemes that will enhance the existing pedestrian infrastructure around the allocation, however, NCC's draft LCWIP for North Walsham has been prepared and identified several routes from the allocation to the facilities identified as being the main corridors for improvement.

Public Rights of Way (PROW)

- 3.18 There are three PROWs that are encompassed by, or adjacent to, the allocation.
- PROW FP17 is a 275-metre footpath that connects Queensway to B1145 Greens Road at the entrance to North Walsham Town Football Club.
 - PROW FP2 runs from the Station Road / Aylsham Road priority junction in an east-to-west direction. This also provides a route to the Rossis Leisure Centre, before becoming FP1.
 - PROW FP6 begins at B1150 Norwich Road, north of Foundry Court, running southwest until it joins PROW FP8.

Weavers' Way

- 3.19 The Weavers' Way is a 61-mile long-distance traffic free path connecting Great Yarmouth and Cromer, via North Walsham. Weavers' Way crosses the allocation between Tungate Road and Station Road using a disused railway line and continues towards the town centre parallel to Skeyton New Road. At Station Road, there is a car park to access the bridleway.
- 3.20 As Weavers' Way is a bridleway in this location, it is available for pedestrians, cyclists, horse riders, and wheelers. The route is lit where it passes through residential areas but is unlit where it crosses fields. The route is identified in the NCC LCWIP as an Active Travel Route for North Walsham.

Cyclists

Accessibility

- 3.21 It is generally considered that up to five kilometres is the recommended maximum distance for the average cyclist to travel to and from work. It would take an average cyclist 15 minutes to cycle five kilometres. It should however be noted that there are cyclists who will travel more than this distance/time and thus it should be considered indicative.
- 3.22 Using the centre of the allocation as a starting point, **Figure 6** below illustrates the locations which should be accessible by cycle in 15 minutes. This suggests that the entirety of North Walsham as well as Antingham, Bradfield, and Felmingham.

Figure 6 – 15-minute Cycling Distance Isochrone

Infrastructure

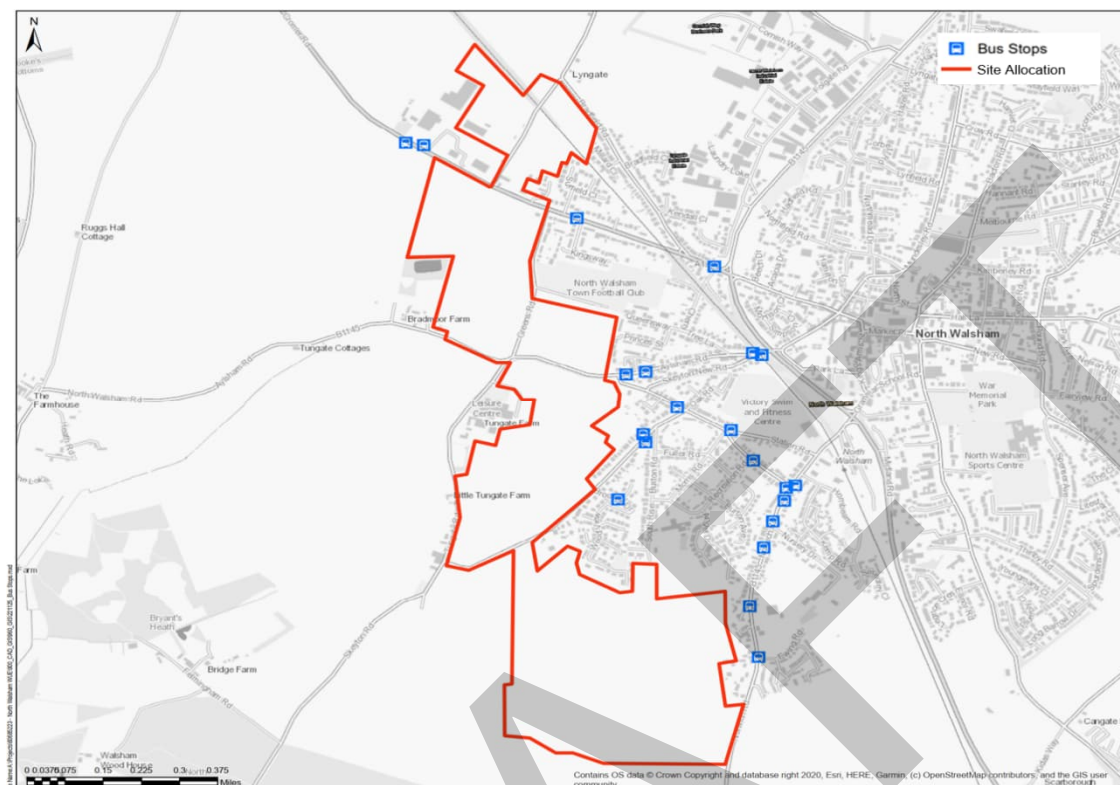
- 3.23 There are limited facilities for cyclists within North Walsham. A shared foot/cycleway runs parallel to the A149 from the signalised junction with B1150 Norwich Road before connecting with Aylsham Road. This route although lit is narrow in places, and its surface, although compacted, is not asphalt and therefore can become slippery when wet, especially on the sections which lead down to Aylsham Road. Cyclists, at this point, if continuing along Aylsham Road need to utilise the carriageway.
- 3.24 A cycleway runs west on Weavers Way parallel to Skeyton New Road from Aylsham Road before ending at the Skeyton New Road / Station Road priority junction. From this point, cyclists are required to utilise the carriageway or Weavers' Way for onward journeys.
- 3.25 A shared foot/cycleway runs adjacent to the southbound carriageway of the B1150 Norwich Road for approximately 160 metres, to the north and south of the B1150 Norwich Road / Ewing Road priority junction. After this point, cyclists must join the carriageway to continue their journey.
- 3.26 In addition to the cycleways which are provided alongside carriageways, as stated previously, cyclists can utilise Weavers' Way for journeys. This is a traffic-free route and is promoted for use for cyclists.

Public Transport

Bus

- 3.27 CIHT's 'Buses in Urban Developments' guidance suggests bus stops should be a maximum walking distance of 400 metres on single high-frequency routes or 300 metres on less frequent routes. The roads passing through the allocation are currently well served by buses, with 20 bus stops provided within 300-400 metres of the allocation.
- 3.28 The bus stops that are currently serviced and located within 400 metres of the allocation are illustrated in **Figure 7** below. In addition to those shown, there are two further stops located on A149 Cromer Road that are not currently in use.

Figure 7 – Bus Stop Locations Within 400m of the Allocation



- 3.29 All the stops within 400 metres of the allocation are located to the west of the railway line, except for one stop on A149 Cromer Road. At the stops, seven are provided with timetable information, whilst six are provided with shelters to protect from inclement weather. The remaining bus stops are flagged and therefore provide little for waiting passengers.
- 3.30 The services which serve the existing bus stops within 400 metres of the allocation are set out in **Table 3** below.

Table 3 – Bus Services Serving Stops Within 400m of the Allocation (Accessed October 2023)

Route No.	Route Description	Frequency Monday to Friday	Frequency Saturday	Frequency Sunday	Operator
1B/2/4A	North Walsham – Swanton Abbott – Worstead	1 per day	No service	No service	Feline Executive Travel
88	North Walsham – Aylsham High School	1 per day	No service	No service	Sanders Coaches
X55	North Walsham – Coltishall – Norwich	Every 30 minutes	Every 30 minutes	Every 1 hour	Sanders Coaches
210	North Walsham – Frettenham – Norwich	Every 1-4 hours	3 per day	1 per day	Sanders Coaches
6A	Cromer – Thorpe Market – North Walsham	Every 1-3 hours	Every 2 hours	No service	Sanders Coaches
18	North Walsham – Aylsham – Cromer	5 per day	2 per day	No service	Sanders Coaches
18A	North Walsham – Roughton	1 per day	No service	No service	Sanders Coaches
33	North Walsham – Northrepps – Cromer	Every 2-3 hours	No service	No service	Our Bus
33A	North Walsham Circular	3 per day	No service	No service	Our Bus

- 3.31 A travel hub, which opened in 2022, is located on New Road in North Walsham town centre, approximately 1.2km from the allocation. Waiting passengers are provided with public toilets, electronic information boards, shelters, and seating, as well as improved facilities to support visually impaired users. The travel hub provides additional services to those which are available within 400 metres of the allocation. These are set out in **Table 4**.

Table 4 – Bus Services Serving North Walsham Travel Hub (Accessed October 2023)

Route No.	Route Description	Frequency Monday to Friday	Frequency Saturday	Frequency Sunday	Operator
CH2	Cromer – Mundesley – North Walsham	Every 1 hour	Every 1 hour	Every 1-2 hours	Sanders Coaches
5	North Walsham – Cromer – Sheringham / Holt	1 per day (to Sheringham)	1 per day (to Holt)	No service	Sanders Coaches
34	North Walsham – Mundesley – Stalham	Every 1-3 hours	No service	No service	Sanders Coaches
6	North Walsham – Gorleston	2 per day	2 per day	No service	Sanders Coaches
X6	North Walsham – Stalham – Gt Yarmouth	Every 1-2 hours	Every 2 hours	No service	Sanders Coaches
NC3	North Walsham – Aylsham – Norwich City FC	NCFC Matchdays	NCFC Matchdays	NCFC Matchdays	Sanders Coaches
NC11	North Walsham – Wroxham – Norwich City FC	NCFC Matchdays	NCFC Matchdays	NCFC Matchdays	Sanders Coaches

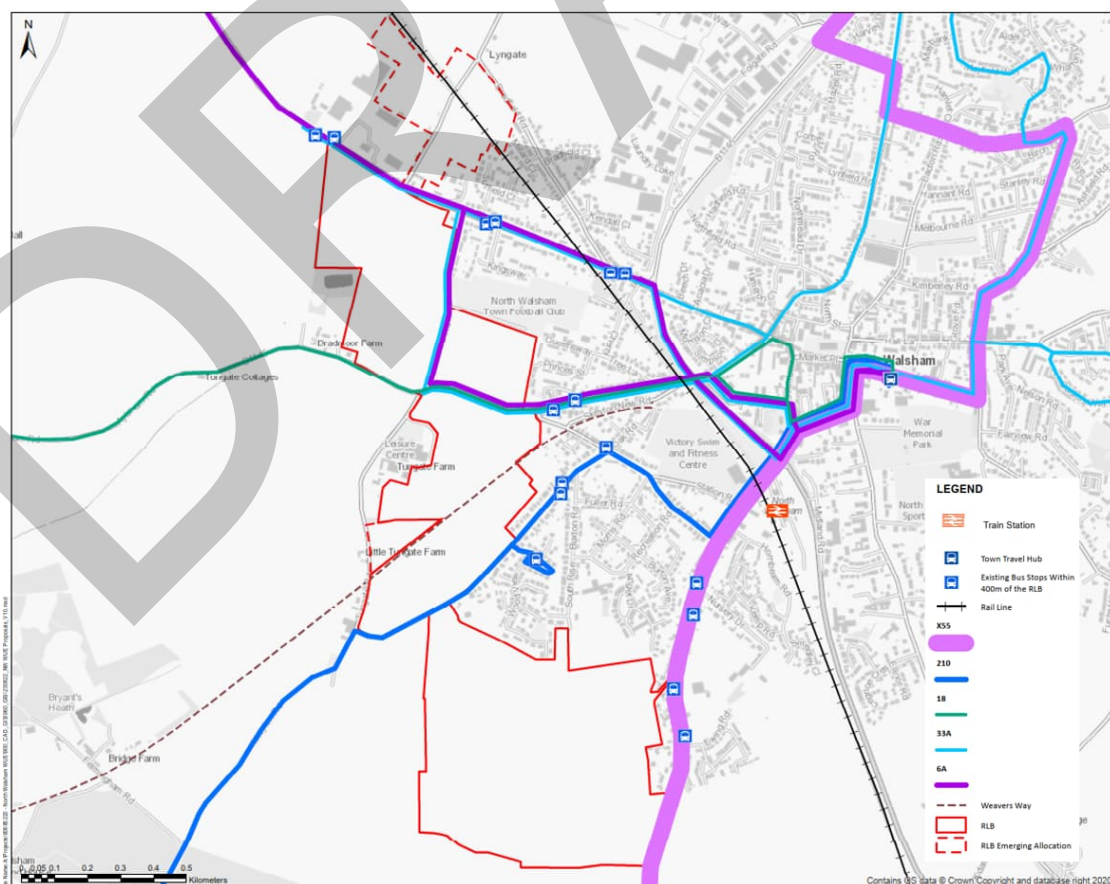
- 3.32 **Table 4** above illustrates that there are many services that operate from the travel hub that serve the wider North Norfolk and Norwich area. Some of these services are school buses, which allow students visiting sixth form centres and colleges in the wider region to travel without recourse to the private car. There are also frequent services to Norwich through a range of bus services, as well as other settlements such as Aylsham, Great Yarmouth, Cromer, and Gorleston. In January 2023, some services from Sanders Coaches were improved, with new single-decker buses used instead of double-decker buses, which has reduced journey times by approximately 15 minutes to Norwich as the new buses can use B1150 Norwich Road, encouraging sustainable bus travel in this area.
- 3.33 The last X55 outbound service from North Walsham departs from the Travel Hub at 18:35 from Monday to Saturday. The last service on Sunday departs the Travel Hub at 17:35. In the reverse direction, the last X55 service from Norwich Bus Station departs at 19:25 and arrives at the North Walsham Travel Hub at 20:08 on Mondays to Saturdays. On Sundays the last service from Norwich departs at 18:30 and arrives at the NW Travel Hub at 19:20.
- 3.34 On Mondays to Saturdays, the X55 from North Walsham runs every half an hour until 16:45, at which points there are only two more services which depart at 17:30 and 18:35. In the reverse direction, the final half-hourly service departs from Norwich at 17:40, with the final two services of the day departing at 18:25 and 19:25. On Sundays the service runs hourly in both directions.
- 3.35 All other bus services which operate between North Walsham and Norwich have a final service earlier than the X55 and are generally much less frequent.
- 3.36 Although there are limited numbers of services outside of the peak hours, the allocation will bring further patronage which will support better service outside of the existing operation hours.
- 3.37 The existing bus stops and the wider connections at the travel hub are such that they should encourage residents and visitors to travel by bus. The enhancements to the bus facilities proposed within the allocation should further encourage travel by bus.

Rail

- 3.38 The nearest railway station is North Walsham which is located approximately 700 metres walking and cycling distance from the centre of the allocation. There are two bus stops located at the station allowing for interchange between modes, therefore, providing an alternative to active travel access from the allocation. The station is served by Greater Anglia trains.

- 3.39 Shelters and CCTV secure cycle storage is available, with 16 cycle spaces provided at North Walsham Station adjacent to the south bound platform. There are two unsheltered cycle stands on the northbound platform. There is also a car park adjacent to the southbound platform with 21 car spaces. A further car park controlled by NNDC is provided with circa 45 parking spaces off Hornbeam Rd, within a five-minute walk of North Walsham Station.
- 3.40 There is no pedestrian access between the platforms at North Walsham Station, instead passengers most walk along the footpath on B1150 to travel between platforms. Greater Anglia, have however, sought funding through Access for All from Central Government for a footbridge and lifts to create step free access across the station. This is being considered by the DfT however no funding decision will be made until April 2024 when the next industry round begins. It is understood from Greater Anglia that the scheme has support from NCC. If successful, the provision of a bridge and lift will significantly enhance access to the station and reduce the need for passengers to utilise the footway under the railway bridge.
- 3.41 Greater Anglia operate an hourly service between Norwich and Sheringham, calling at Hoveton & Wroxham, Worstead, North Walsham, Cromer, and West Runton. This provides excellent access to employment and leisure locations. Journeys to Norwich take approximately 30 minutes whilst Sheringham can be reached in approximately 34 minutes. The connection with Norwich allows a wider geographical area to be reached, with services to London, Cambridge, and Liverpool.
- 3.42 North Walsham station is well used, with 221,032 passengers using the station between April 2021 and March 2022 (Office for Road and Rail).
- 3.43 The station provides an alternative mode of travel for longer journeys that would usually be taken by car and is accessible to the allocation by foot, cycle, and bus which should encourage existing and future residents and visitors to travel by train.
- 3.44 Public transport services are illustrated on **Figure 8** below with the most frequent routes highlighted with thicker lines.

Figure 8 – Public Transport Services within North Walsham



Summary

- 3.45 A review of the existing public transport facilities illustrates that there are several buses stops within reasonable walking distance of the site along with a railway station. These services provide high frequency services to key destinations such as Norwich which can reduce the reliance on the private car.
- 3.46 There is a slight shortfall in service provision outside of the peak hours in terms of bus services which can limit the use of buses for journeys that are required to be undertaken either early in the morning and later in the evening. Barriers to use of the rail network also exist with the inability to cross between platforms without utilising a relatively narrow footway alongside the B1150. There is also limited cycle parking at the station resulting in less chance for mixed mode journeys.

Existing Facilities and Amenities

- 3.47 There are several facilities and amenities in the general vicinity of the allocation. **Table 5** below outlines the different amenities and their walking and cycling distance and time. The Google Maps route planning tool has been used to derive the distances and times. It is assumed that accounting for topography, the average walking speed is approximately three miles per hour (mph) (4.83 kilometres per hour (km/h)) and the average cycling speed is approximately ten mph (16.09 km/h). However, the times and distances should be considered indicative.
- 3.48 The walking and cycling distances and times in **Table 5** are ranges as the allocation covers a large area and are therefore based on the closest and furthest point from each amenity. The times to reach these amenities is also included. It should be noted that the list is not exhaustive and there are other amenities and facilities within the town centre such as local independent retailers and cafes and restaurants.

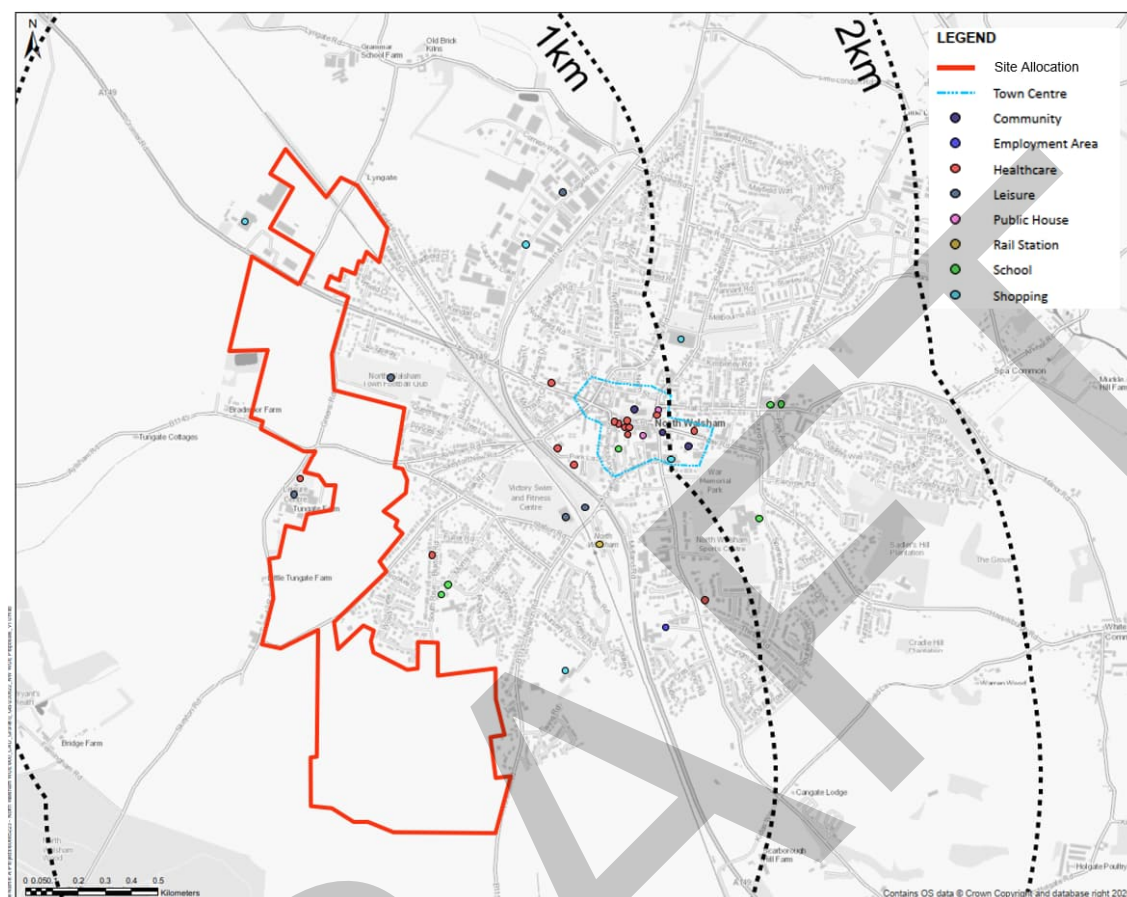
Table 5 – Existing Amenities Information and Access for Pedestrians and Cyclists

Type of Amenity	Name	Walking		Cycling	
		Distance (kilometres)	Time (minutes)	Distance (kilometres)	Time (minutes)
Rail Station	North Walsham Train Station	1.3 – 1.8	15 – 22	1.3 – 1.8	4 – 7
School	North Walsham Infant School & Nursery	1.8 – 2.1	23 – 26	1.9 – 2.2	7 – 8
School	Millfield Pre School	1.0 – 1.6	13 – 22	1.0 – 1.8	3 – 6
School	Millfield Primary School	1.0 – 1.6	13 – 22	1.0 – 1.8	3 – 6
School	North Walsham Junior School	1.7 – 2.3	22 – 28	1.8 – 2.4	7 – 9
School	North Walsham High School	1.9 – 2.5	25 – 31	2.0 – 2.5	9 – 10
School	Paston College	1.5 – 1.9	19 – 23	1.6 – 1.9	6 – 7
Public House	White Swan	1.2 – 1.9	15 – 23	1.2 – 2.0	5 – 7
Public House	Black Swan	1.1 – 1.9	15 – 23	1.2 – 1.9	5 – 7
Leisure	Victory Swim & Fitness Centre	0.65 – 1.8	8 – 23	0.65 – 1.8	2 – 6
Leisure	Gravity Skatepark	1.0 – 1.8	11 – 23	0.95 – 1.9	3 – 6
Leisure	Rossis Leisure	0.05 – 2.2	1 – 26	0.05 – 2.2	1 – 6
Leisure	Yendell's Health & Wellness Hub	1.4 – 2.4	17 – 29	1.4 – 2.5	4 – 9
Leisure	North Walsham Town FC	0.05 – 2.6	1 – 31	0.05 – 2.6	1 – 8
Community	North Walsham Community Centre & Library	1.5 – 2.0	19 – 25	1.5 – 2.0	6 – 8
Community	North Walsham Travel Hub	1.5 – 2.0	19 – 25	1.5 – 2.0	6 – 8
Community	North Walsham Post Office	1.4 – 1.9	17 – 23	1.4 – 1.9	6 – 8
Community	St Nicholas Church	1.3 – 1.8	16 – 22	1.3 – 1.8	5 – 6
Shopping	North Walsham Garden Centre	0.75 – 2.3	9 – 29	0.75 – 2.3	2 – 8
Shopping	Sainsbury's	1.5 – 2.0	18 – 24	1.5 – 2.0	5 – 7

Type of Amenity	Name	Walking		Cycling	
		Distance (kilometres)	Time (minutes)	Distance (kilometres)	Time (minutes)
Shopping	Waitrose & Partners	0.05 – 3.2	1 – 39	0.05 – 3.2	1 – 10
Shopping	Lidl	1.5 – 1.9	19 – 25	1.5 – 2.0	6 – 8
Employment Area	Folgate Road Industrial Estate	1.6 – 2.6	19 – 31	1.6 – 2.6	4 – 8
Healthcare	North Walsham Memorial Hospital	2.2 – 2.7	27 – 34	2.2 – 2.8	7 – 10
Healthcare	Birchwood Medical Practice	0.95 – 1.6	12 – 20	1.0 – 1.8	4 – 7
Healthcare	Paston Surgery	1.0 – 1.5	13 – 19	1.0 – 2.0	5 – 7
Healthcare	Grovefield Dental Surgery	1.9 – 2.4	24 – 31	2.0 – 2.5	7 – 9
Healthcare	The Rose Cottage Dental Practice	1.4 – 1.9	17 – 24	1.4 – 1.9	5 – 7
Healthcare	MyDentist	1.2 – 1.7	15 – 21	1.2 – 1.7	4 – 6
Healthcare	Bupa Dental Care	1.2 – 1.7	15 – 21	1.2 – 1.7	4 – 6
Healthcare	North Walsham Chiropractic Clinic	1.3 – 1.9	17 – 23	1.4 – 2.0	5 – 7
Healthcare	Active Health Norfolk	1.1 – 1.9	14 – 23	1.1 – 2.1	4 – 9
Healthcare	Reanimar Sports Massage	0.1 – 1.7	1 – 22	0.1 – 1.7	1 – 6
Healthcare	North Norfolk Physio	0.05 – 2.2	1 – 26	0.05 – 2.2	0 – 6
Healthcare	Well Pharmacy	1.3 – 1.8	15 – 21	1.3 – 1.8	5 – 6
Healthcare	Boots Pharmacy	1.3 – 1.8	15 – 21	1.3 – 1.8	5 – 6
Healthcare	North Walsham Pharmacy	0.9 – 1.4	11 – 17	0.9 – 1.4	4 – 6
Healthcare	Specsavers Opticians and Audiologists	1.3 – 1.8	15 – 21	1.3 – 1.8	5 – 6
Healthcare	R M Ling Optometrists	1.5 – 1.9	17 – 22	1.5 – 1.9	6 – 8

3.49 **Figure 9** below illustrates the locations of the existing local amenities and facilities listed in **Table 5** above.

Figure 9 – Local Facilities and Amenities



- 3.50 This illustrates that there are many amenities and facilities near to the allocation accessible by sustainable modes of transport, therefore reducing the reliance on private cars.

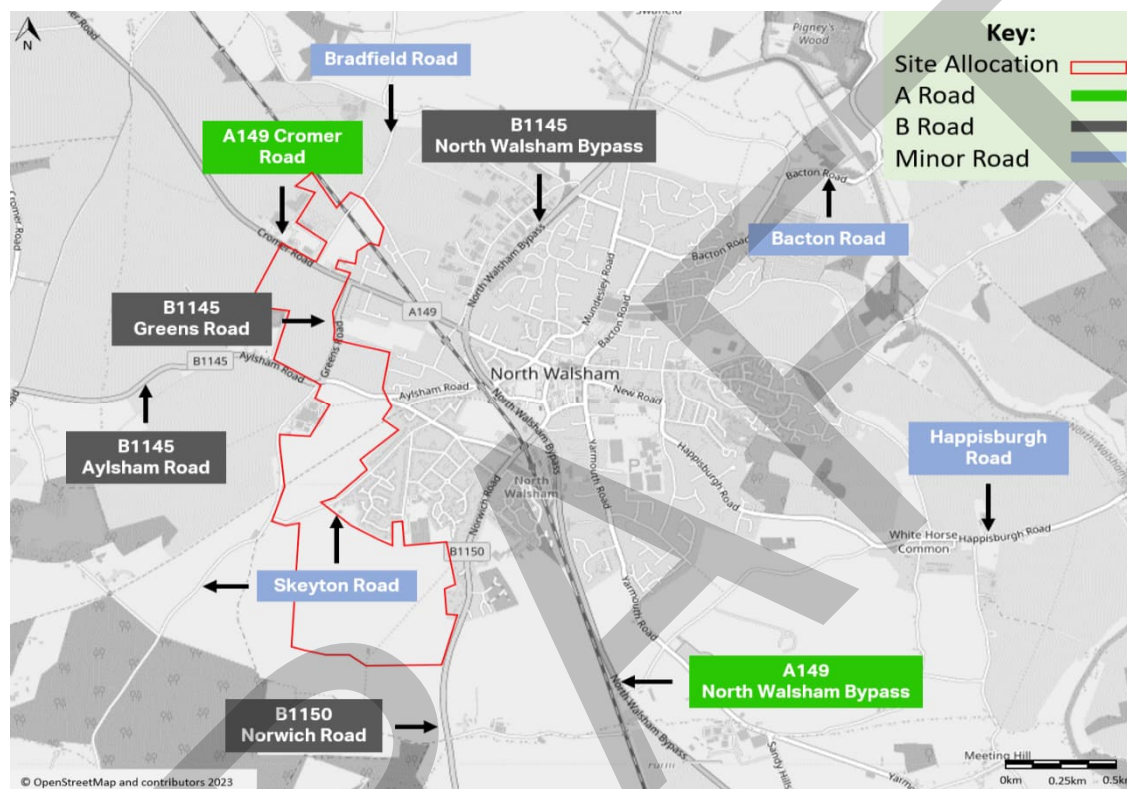
Highway Network

North Walsham

- 3.51 The existing highway network bounds and bisects the allocation at several points, including A149 Cromer Road, Bradfield Road, B1145 Greens Road, B1145 Aylsham Road, Skeyton Road, Tungate Road, and B1150 Norwich Road.
- 3.52 The A149 Cromer Road runs in a northwest-to-east direction and connects North Walsham town centre with Cromer. The B1145 Aylsham Road runs in a west-to-east direction and connects North Walsham town centre to the A140 at a priority junction, north of Aylsham. The B1150 runs north to south and connects North Walsham with Norwich running from the B1150 Norwich Road / Norwich Road / A149 signalised junction to the B1150 North Walsham Road / A1270 Broadland Northway roundabout.
- 3.53 B1145 Greens Road is located within the allocation and runs north to south, connecting A149 Cromer Road and B1145 Aylsham Road at a priority junction at both points. The carriageway measures six metres wide, and there are no pedestrian facilities adjacent to the carriageway.
- 3.54 Tungate Road borders the allocation to the west. Tungate Road connects to the B1145 Aylsham Road, before becoming Skeyton Road after the Tungate Road / Skeyton Road priority junction to the west of the allocation. Tungate Road provides access to employment near the Skeyton Road / Tungate Road priority junction, as well as Rossis Leisure/JR's children play centre, located approximately 100 metres south of the B1145 Aylsham Road / Tungate Road priority junction.

- 3.55 Skeyton Road runs in a northeast-to-southwest direction, beginning at the Tungate Road / Skeyton Road priority junction and ending at the Skeyton Road / Oak Road / Station Road crossroads junction. Skeyton Road provides access to residential areas towards the crossroads junction, before becoming a 60mph speed limit countryside road with no pedestrian facilities. The road measures approximately three metres wide in the countryside, and six metres wide in the residential area.
- 3.56 The existing wider highway network is shown in **Figure 10** below.

Figure 10 – Highway Network



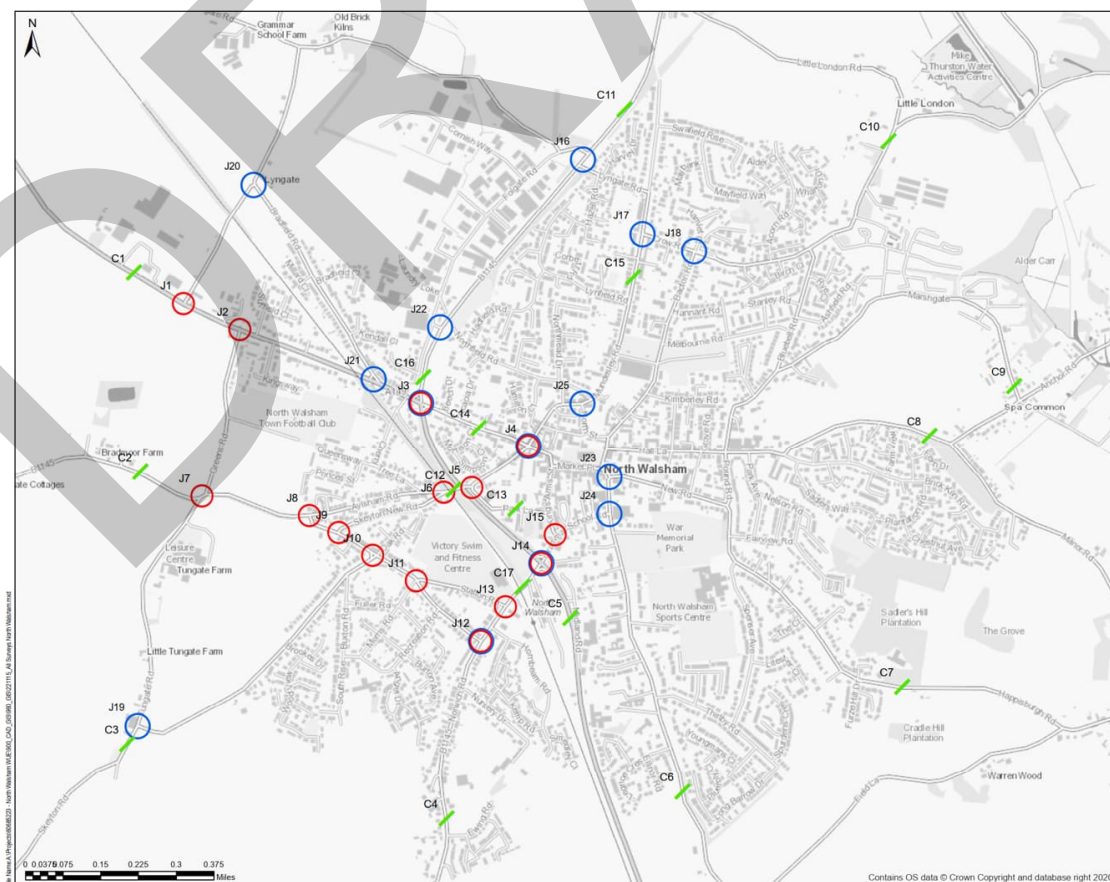
Traffic Surveys

- 3.57 To understand how the existing road network within North Walsham operates and to derive a baseline against which to carry out the assessment, traffic surveys were commissioned. Manual Classified Counts (MCC) and queue length surveys were undertaken on 12th, 13th, and 14th July 2022 and again on Thursday 10th November 2022. These were neutral weekdays in neutral months, as per the Transport Analysis Guidance (TAG) from the Department for Transport (DfT) and carried out between 07:00 hours and 10:00 hours and between 15:00 hours and 19:00 hours. These dates were agreed with NCC. The queue length surveys recorded queues every five minutes and the results were defined as vehicles per lane. The MCCs and queue length surveys were carried out at the 25 junctions which constitute the study area.
- 3.58 Automatic Number Plate Recognition (ANPR) surveys were also undertaken in North Walsham between 12th and 14th July. Automatic Traffic Counts (ATC) surveys were undertaken for 14-day periods in July and November. The July surveys were carried out between 8th July and 21st July 2022, whilst the November surveys were carried out between Thursday 10th and Thursday 24th November 2022, which includes the day the MCC was carried out. Queues were also recorded. The locations of the MCC surveys are listed below:
1. A149 Cromer Road / Bradfield Road – three-arm priority junction.
 2. A149 Cromer Road / B1145 Greens Road – three-arm priority junction.
 3. A149 / B1145 / Cromer Road – four-arm signalised junction.
 4. Cromer Road / Aylsham Road / Market Street / Mundesley Road – four-arm signalised junction.
 5. Aylsham Road / Park Lane – three-arm priority junction.
 6. Aylsham Road / Skeyton New Road – three-arm priority junction.

7. Aylsham Road / Tungate Road / B1145 Greens Road – four-arm staggered crossroads.
8. Aylsham Road / Station Road – three-arm priority junction.
9. Station Road / Skeyton New Road – three-arm priority junction.
10. Station Road / Skeyton Road / Oak Road – four-arm crossroads.
11. Station Road / Morris Road / Millfield Road – four-arm mini-roundabout.
12. B1150 Norwich Road / Millfield Road – three-arm priority junction.
13. B1150 Norwich Road / Station Road – three-arm priority junction.
14. A149 / B1150 Norwich Road – four-arm signalised junction.
15. Norwich Road / Grammar School Road / King's Arms Street – three-arm mini-roundabout.
16. B1145 Lyngate Road / Lyngate Road / Folgate Road – four-arm staggered crossroads.
17. Crow Road / Mundesley Road – three-arm priority junction.
18. Bacton Road / Crow Road / Hamlet Close – four-arm priority junction.
19. Skeyton Road / Tungate Road – three-arm priority junction.
20. Bradfield Road / Bradfield Road – three-arm priority junction.
21. A149 Cromer Road / Bradfield Road – three-arm priority junction.
22. B1145 / Laundry Loke – three-arm priority junction.
23. Yarmouth Road / Market Place / New Road – three-arm priority junction.
24. Yarmouth Road / Grammar School Road – three-arm mini-roundabout.
25. North Street / Mundesley Road – three-arm priority junction.

3.59 The study area for North Walsham is illustrated in **Figure 11** below.

Figure 11 – North Walsham Study Area



Peak Hours

3.60 The peak hours for North Walsham have been derived from the traffic counts undertaken on the local road network, and are as follows:

- AM Peak – 08:00 hours to 09:00 hours.
- PM Peak – 16:30 hours to 17:30 hours.

3.61 Diagrams illustrating the peak hour traffic volumes and the HGV volumes during the AM and PM peak hours in North Walsham are provided in Appendix C, Figures 1-4.

Existing Traffic Patterns

3.62 In addition to the traffic surveys, a review has been undertaken of the existing traffic conditions available from Google Maps Traffic for a typical weekday (Wednesday) at 08:30 and 17:00 (mid-way points in the AM and PM peak hours). The Google Maps Traffic images can be viewed in **Figure 12** and **Figure 13**, and the key is as follows:

- **Green:** No traffic delays. Free flow traffic.
- **Orange:** Medium traffic speed.
- **Red:** Traffic delays. The darker the red the slower the speed of traffic on the roads.

Figure 12 – AM Peak (08:30) Traffic in North Walsham

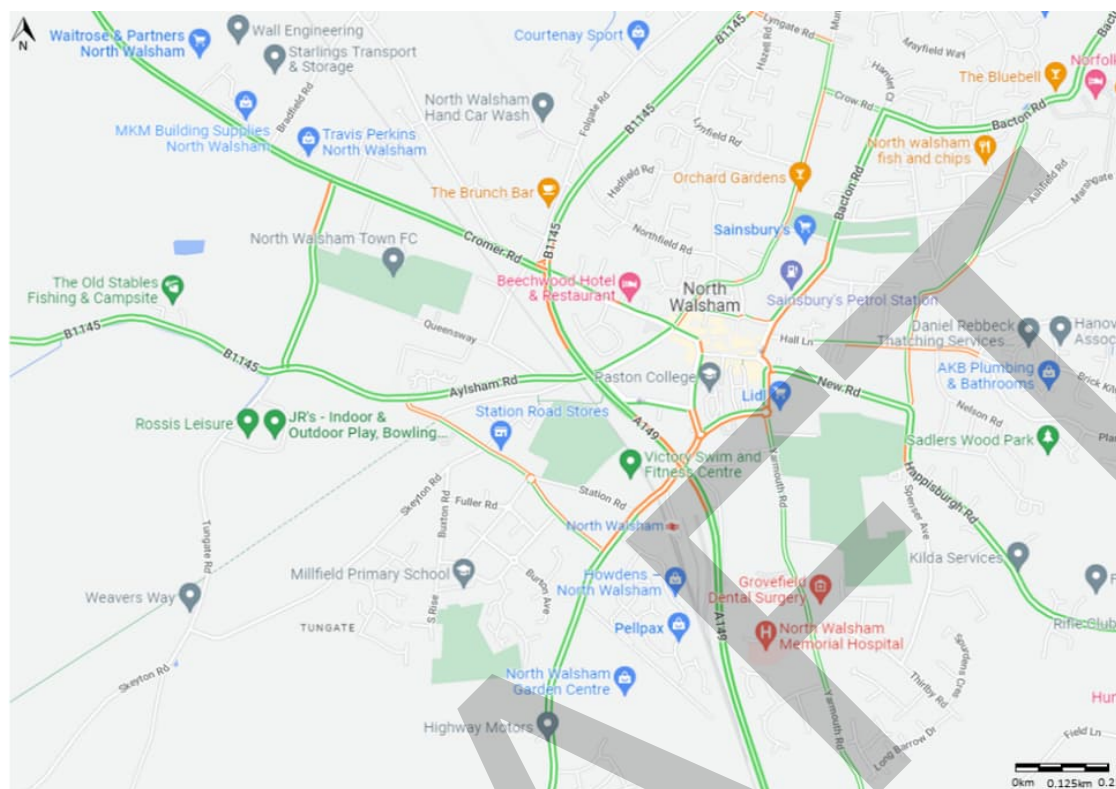
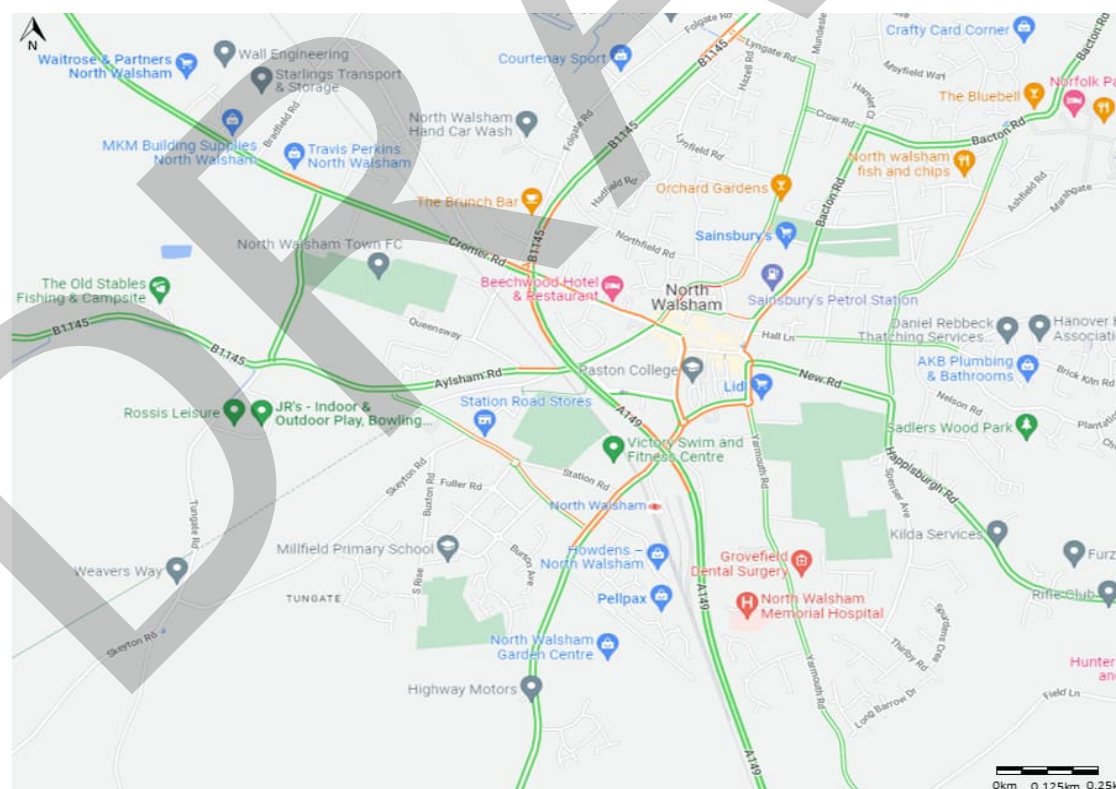


Figure 13 – PM Peak (17:00) Traffic in North Walsham



3.63 Traffic in the AM and PM peaks is generally free flowing. There are no locations experiencing regular traffic delays, though there are several areas, particularly on all arms of the A149 / B1150 Norwich Road signalised junction, where there is slower traffic speeds. Station Road towards the junction with B1150 Norwich Road also experiences medium traffic speed. The main roads around the town centre, such as King's Arms Street and Grammar School Road also experience medium traffic speed in the peaks. The A149 / B1145 / A149 Cromer Road signalised junction also experiences medium traffic speed.

Speed Analysis

- 3.64 The ATCs undertaken in North Walsham provided both volumetric and speed data. A review of the six ATCs undertaken on the western side of North Walsham identifies the vehicle speeds in the vicinity of the development site. The results are summarised in **Table 6** below.

Table 6 – ATC Speed Data North Walsham

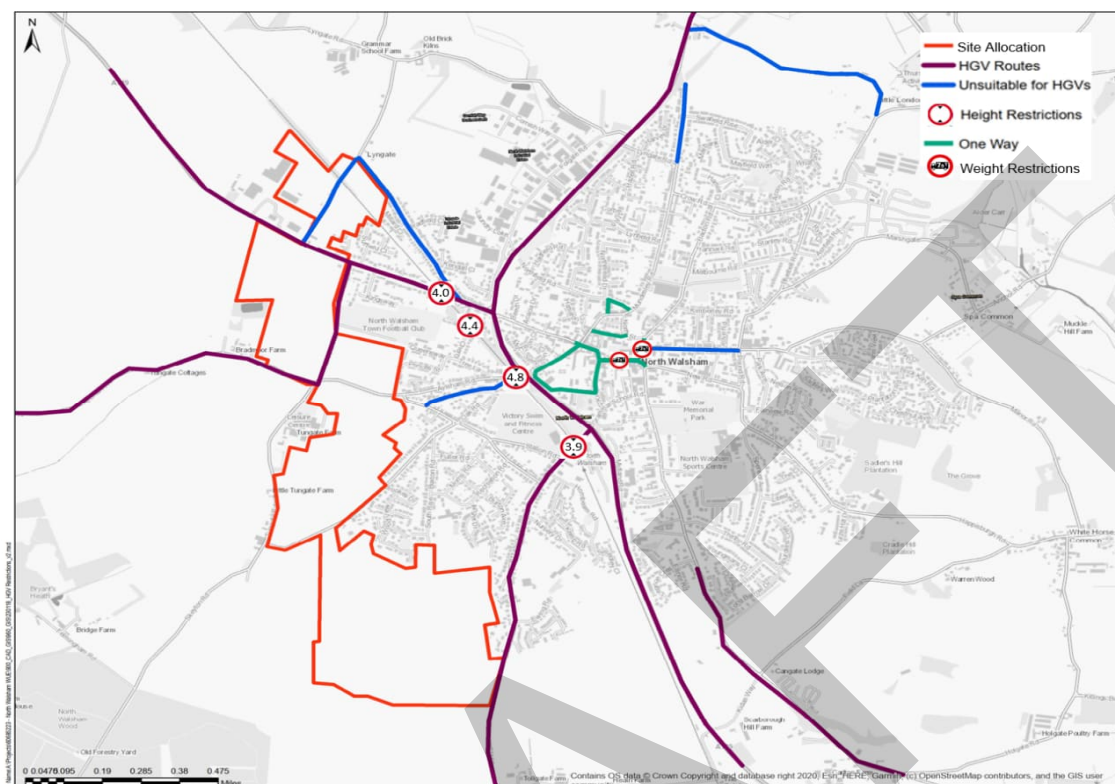
Ref	Site	Direction	Speed Limit	85% Speed	85% Speed > Limit	Mean Speed	Mean Speed > Limit
C1	A149 / Cromer Road	Eastbound	40	37.1	No	33.1	No
		Westbound	40	41.9	Yes	37.5	No
C2	B1145 / Aylsham Road	Eastbound	60	40.8	No	35.9	No
		Westbound	60	45.4	No	40.2	No
C3	Skeyton Road	Northbound	60	31.4	No	24.5	No
		Southbound	60	32.1	No	25.3	No
C4	B1150 / Norwich Road	Northbound	30	38.5	Yes	32.8	Yes
		Southbound	30	42.8	Yes	37.7	Yes
C12	Aylsham Road (Railway Bridge)	Eastbound	20	27.5	Yes	23.5	Yes
		Westbound	20	25.4	Yes	21.8	Yes
C17	B1150 / Norwich Road (Railway Bridge)	Northbound	30	25.0	No	20.0	No
		Southbound	30	27.5	No	23.8	No

- 3.65 This data illustrates that in most locations the 85th percentile speed and mean speed are close to the posted speed limit. The exceptions to this are along B1145 / Aylsham Rd and Skeyton Rd, where speeds are substantially below the speed limit on the outskirts of North Walsham, reflecting the design speed of the road. Also, on Aylsham Rd in the vicinity of the railway bridge, speeds are above the posted 20mph limit, suggesting that further intervention may be required in this area where pedestrians are particularly vulnerable. Along the B1150 along the southern edge of the settlement area speeds are more than the 30mph limit.

High-Sided Vehicles in North Walsham

- 3.66 There are several constraints for high-sided vehicles moving around North Walsham including weight and height restrictions. This increases journey times for the drivers and can inconvenience residents. NCC have identified the HGV routes in Norfolk and those relating to North Walsham are shown in **Figure 14** along with the constraints of North Walsham's highway network for high-sided vehicles.

Figure 14 – Restrictions for High-Sided Vehicles in North Walsham



- 3.67 This plan highlights that the B1150 and the A149 are they HGV routes promoted in North Walsham. It also highlights the bridge height restrictions which exist, with the highest clearance for HGVs between the east and west of North Walsham provided on Aylsham Road at 4.8m. Whilst Aylsham Road is not promoted as an HGV route, it is required as a route for vehicles higher than 4.0m to access North Walsham from the west.
- 3.68 Surveyed HGV volumes during the AM and PM peak hours in North Walsham are provided in **Appendix C** as Figures 2 and 4.
- 3.69 Video footage taken on 13th July 2022 was investigated during the AM and PM peak hours at three of the four locations with height restrictions, namely at Cromer Road, Aylsham Road, and Norwich Road. The aim was to ascertain the number of high-sided vehicles, defined as those higher than 2.9m in height, passing under each railway bridge and to better understand existing usage. The results are summarised in **Table 7**.

Table 7 – High-Sided Vehicle Observations at Railway Bridges

Railway Bridge location	Total High-sided vehicles	AM Peak		PM Peak		
		Total HGVs & PSVs	% High-sided vehicles	Total High-sided vehicles	Total HGVs & PSVs	% High-sided vehicles
Cromer Road	37	70	53%	20	38	53%
Aylsham Road	4	13	31%	6	7	86%
Norwich Road	8	34	24%	7	22	32%

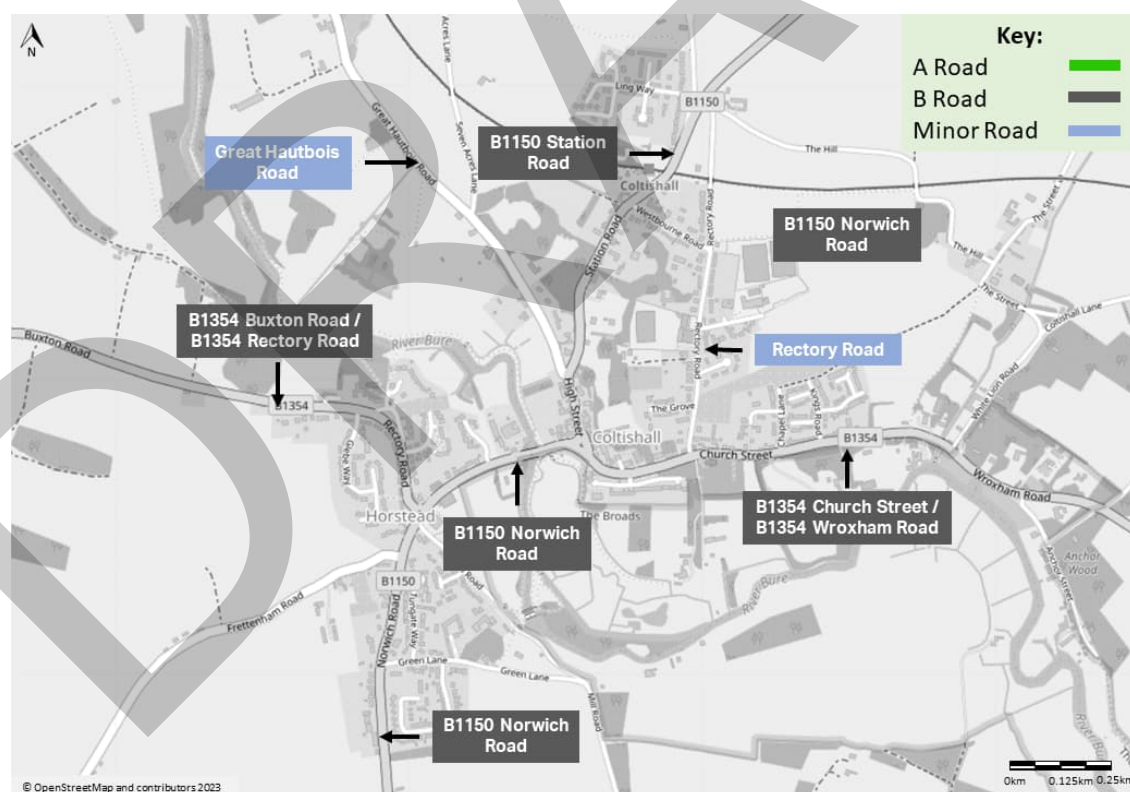
- 3.70 Overall, the total HGV traffic was observed to be higher in the AM peak than in the PM peak. Overall, most high-sided vehicles use Cromer Road, followed by Norwich Road and Aylsham Road.
- 3.71 It is unsurprising that Cromer Road (A149), as the most strategic route entering North Walsham from the west of the railway line, accommodates the highest proportion of HGVs and high sided vehicles. Cromer Road leads traffic directly onto the North-South bypass of North Walsham Town. The percentage of high-sided vehicles is consistent for both time periods, at 53%.

- 3.72 Aylsham Road accommodates significantly fewer HGVs and high sided vehicles despite having the highest clearance height. HGV Traffic on Aylsham Road was only 13 vehicles in the AM peak, of which seven were buses, and seven in the PM peak, of which two were buses. The number of high-sided vehicles was six and four during the AM and PM peak hours respectively.
- 3.73 At Norwich Road, the number of high-sided vehicles was similar in both peak periods, with percentages ranging from 24% to 32% most likely limited by the lower bridge height. Approximately half of the total HGV traffic on Cromer Road and Aylsham Road consist of high-sided vehicles, however, Aylsham Road experiences much lower HGV volumes. Meanwhile, approximately a quarter of vehicles on Norwich Road during peak hours are high sided.
- 3.74 In the absence of an alternative route from the west across the railway line, there will continue to be a reliance on Aylsham Road as a route for HGVs higher than 4m in height. The volume of vehicles which fall in this category is shown to be very low. For the HGVs which are not 'high-sided' one can only assume that their destination sits within the town centre, requiring the use of Aylsham Road for access. Aylsham Road is also a valued route for buses in North Walsham as illustrated in **Figure 8**.

Coltishall

- 3.75 One of the key routes from the allocation is via the B1150 Norwich Road which passes through the village of Coltishall, located some 12km south of North Walsham. The B1150 Norwich Road is a key route as it connects North Walsham with Norwich City and the A1270 Broadland Northway. Due to Coltishall's positioning along this dominant desire line, the impact of the allocation on the village has been raised as a concern. The Coltishall highway network is illustrated in **Figure 15** and summarised in the following paragraphs.

Figure 15 – Coltishall Highway Network



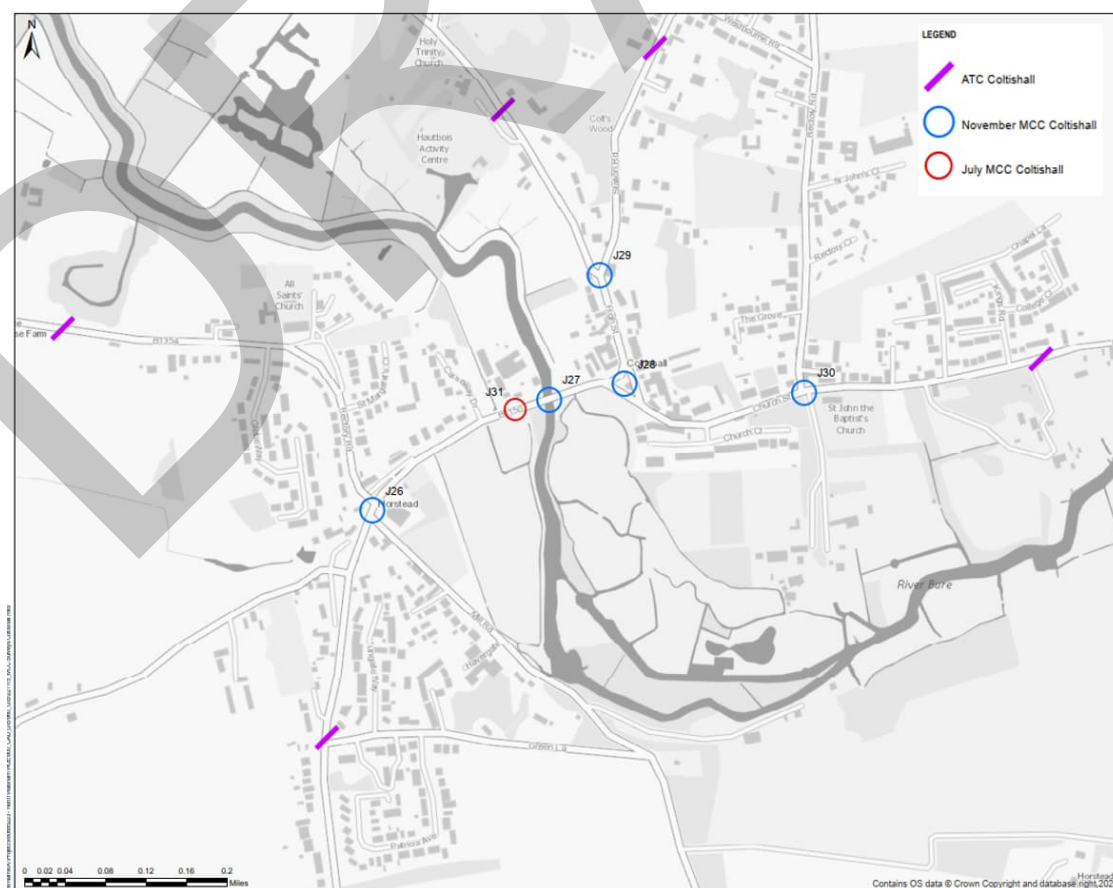
- 3.76 The B1150 passes through the centre of Coltishall forming part of the high street where on-street parking, bus stops and footways are provided. Here, it is subject to a 20mph speed limit. On-site observations and the traffic surveys have confirmed that there are occasions when vehicles are required to give-way to oncoming vehicles.
- 3.77 The B1150 continues towards Norwich crossing the River Bure. At the point where the road crosses the river, the bridge acts as a constraint due to being not being wide enough to accommodate a car and HGV passing. An informal give-way system when larger vehicles approach operates.

- 3.78 The main junction in the centre of Coltishall is the B1354 Church Street / B1150 Norwich Road / B1150 High Street / B1150 Church Street diverging priority junction. Due to the presence of a Petrol Filling Station (PFS) located in the centre of these junctions, it acts as a gyratory. No right lanes are present on the B1150 to aid vehicles and therefore blocking of through traffic can occur.
- 3.79 B1354 Buxton Road and B1354 Wroxham Road are located to the west and east of Coltishall respectively. B1354 Buxton Road connects Coltishall to Buxton, Scottow Enterprise Park (located at the former RAF Coltishall), and A140 Cromer Road. B1354 Wroxham Road connects Coltishall to Hoveton, Wroxham, A1151 Stalham Road, and A1062 Horning Road, which provides connections to Stalham and Horning respectively.
- 3.80 Great Hautbois Road runs north to south and provides another connection between Coltishall and Scottow Enterprise Park. Rectory Road is a minor road which runs north to south, connecting to the B1150 and B1354; the primary school and medical practice is accessed along this road.

Traffic Surveys

- 3.81 To inform the assessment and identify the baseline scenario, traffic surveys were undertaken in Coltishall on the same days and times as those carried out in North Walsham at the locations identified below and illustrated in **Figure 16** below.
26. Combined B1354 Rectory Road / B1150 Norwich Road Mini-Roundabout and B1150 Norwich Road / Mill Road priority junction.
 27. B1150 Norwich Road, on the Coltishall bridge.
 28. B1354 Church Street / B1150 Norwich Road / B1150 High Street – three-arm diverging priority junction.
 29. B1150 High Street / B1150 Station Road / Great Hautbois Road – three-arm priority junction.
 30. B1354 Church Street / Rectory Road / Church Loke – four-arm crossroads; and
 31. B1150 Norwich Road, west of the bridge.

Figure 16 – Coltishall Study Area



Peak Hours

3.82 The peak hours for Coltishall have been derived from the traffic surveys at Coltishall, and are as follows:

- AM Peak – 07:45 hours to 08:45 hours.
- PM Peak – 16:30 hours to 17:30 hours.

3.83 Diagrams illustrating the traffic volumes recorded during peak hours and the HGV volumes are illustrated in Figures 31-34 in **Appendix C**.

Existing Traffic Patterns

3.84 The dominant route through Coltishall is the B1150 which carries close to 10,000 vehicles on an average weekday, of which 2.9% comprise HGVs and Buses. This is the route that development traffic will be focussed on, en-route to Norwich and the Broadland Northway. **Table 8** below illustrates the daily traffic data results for the traffic counter positioned to the North of Coltishall along the B1150.

Table 8 – 2022 Annual average Daily Traffic B1150, North of Coltishall

ATC Site	AADT Two Way All Vehicles	Daily Two Way HGVs	% HGVs	Daily Two Way HGV + PSVs	% HGV + PSVs
B1150 North Walsham Road (north of Coltishall)	9779	281	2.9%	286	2.9%

3.85 This volume of traffic is quite typical for a B road and the quantum of HGVs is relatively low.

3.86 Google Maps has been reviewed to understand the existing traffic condition in terms of the flow of traffic. Using the same criteria as that set for North Walsham, the resulting Google Maps images are set out in **Figure 17** and **Figure 18**.

Figure 17 – AM Peak (08:15) Traffic Conditions in Coltishall

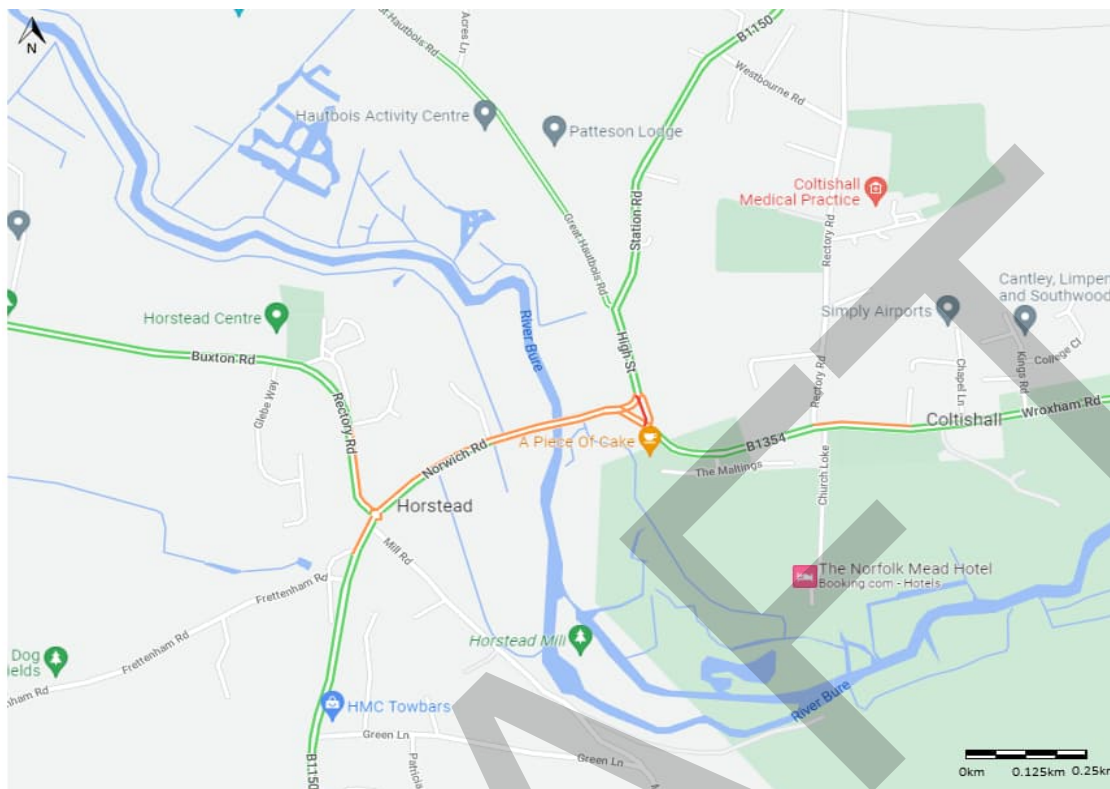
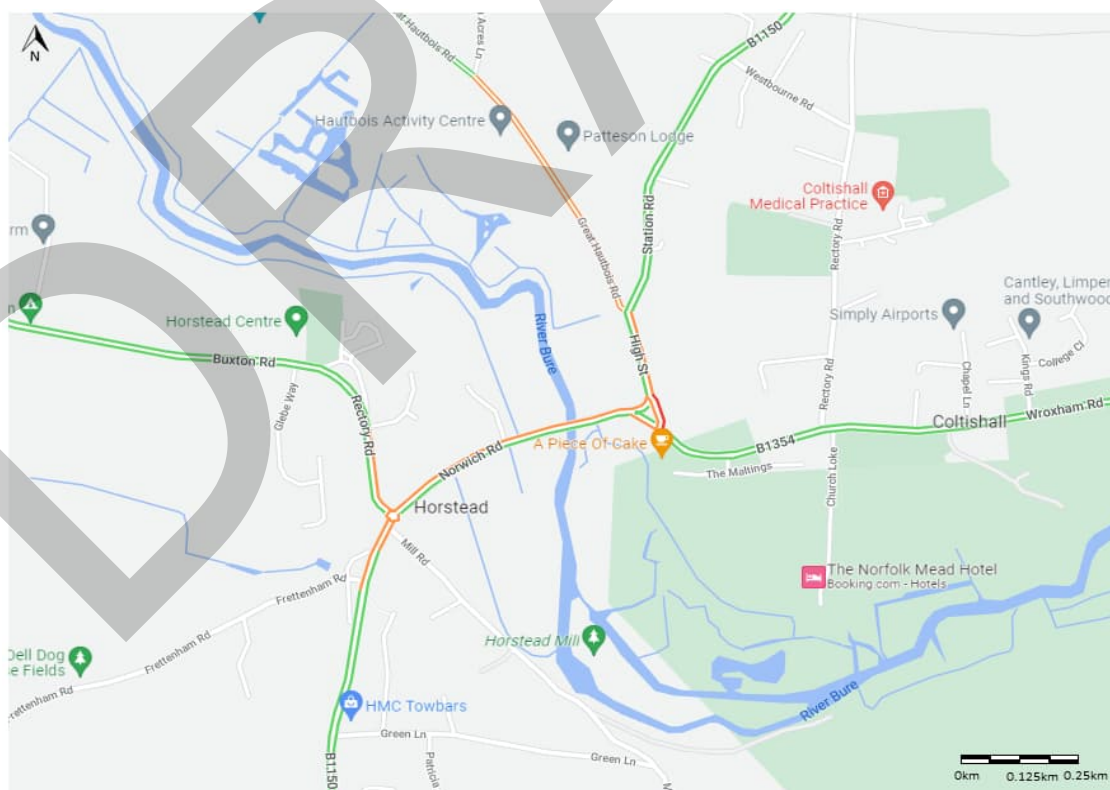


Figure 18 – PM Peak (17:00) Traffic Conditions in Coltishall



3.87 Slower moving traffic is observed to occur on the B1150 High Street and Norwich Road in both the AM and PM however it is observed to cover a greater distance in the PM peak. This was observed to be caused by right-turning vehicles at the gyratory blocking northbound through traffic.

Speed Analysis

- 3.88 The ATCs undertaken in Coltishall and Horstead provided both volumetric and speed data. A review of the five ATCs undertaken in Coltishall has been carried out and the results are summarised in **Table 9** below.

Table 9 – ATC Speed Data Coltishall and Horstead

Site	Direction	Speed Limit	85% Speed	85% Speed > Limit	Mean Speed	Mean Speed > Limit
B1150 North Walsham Road	Northbound	30	32.5	Yes	28.4	No
	Southbound		31.0	Yes	27.4	No
Great Hautbois Road	Northbound	40	38.5	No	32.5	No
	Southbound		39.5	No	33.0	No
B1354 Wroxham Road	Eastbound	30	35.6	Yes	29.9	No
	Westbound		31.9	Yes	26.1	No
B1150 Norwich Road (Horstead)	Northbound	30	35.1	Yes	30.5	Yes
	Southbound		35.8	Yes	30.9	Yes
Rectory Road	Eastbound	30	44.5	Yes	37.4	Yes
	Westbound		45.1	Yes	38.8	Yes

- 3.89 The results of the speed analysis indicate that generally traffic speeds within Coltishall and Horstead are close to the posted speed limit when the 85%tile speeds are considered. The mean speeds illustrate that generally speeds in Coltishall are below the posted speed limit. The mean speeds recorded at the two sites in Horstead however indicate that vehicles are, generally, travelling at speeds some 7mph to 8mph over the speed limit on Rectory Road whilst on the B1150 Norwich Road they are marginally faster than the posted speed limit. It is worth noting that the ATC site in Horstead was located close to the change in speed limit at the edge of the village.

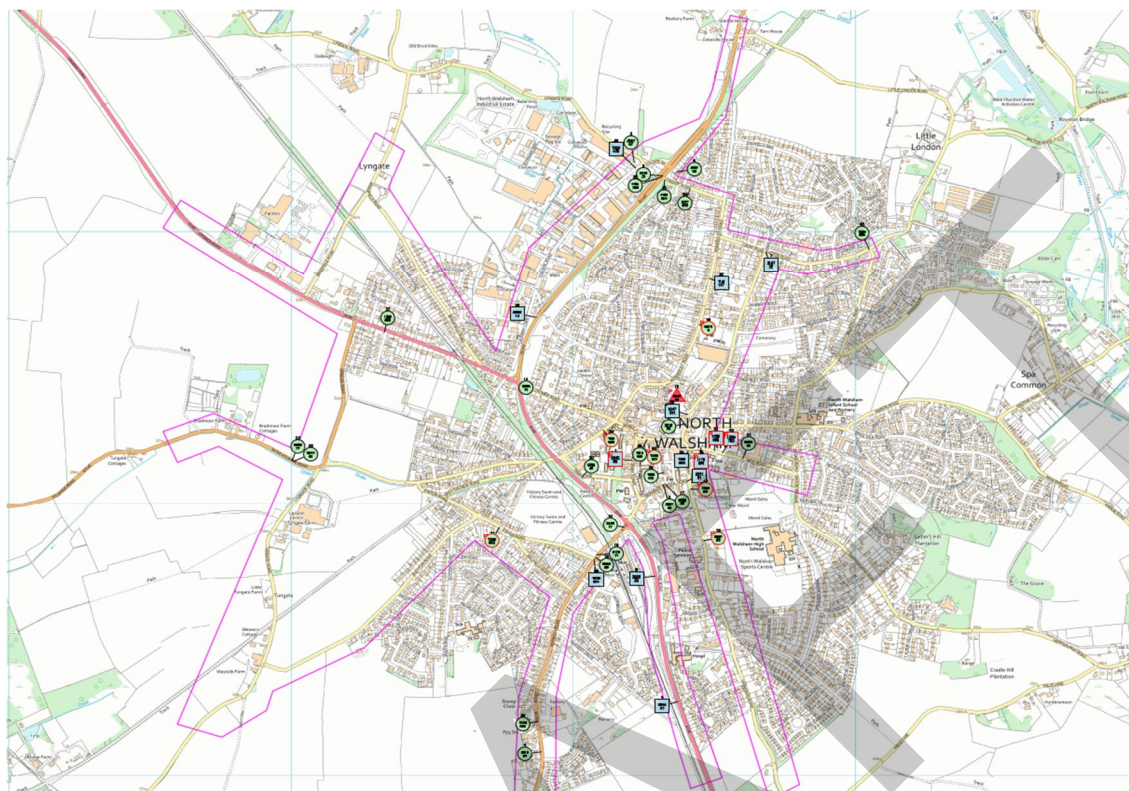
Personal Injury Accident Analysis

- 3.90 Personal Injury Accident (PIA) data has been obtained from NCC for the most recently available five-year period (1st April 2018 to 31st March 2023). The road network study area covers the west of North Walsham and the main roads and junctions that are being assessed in both North Walsham and Coltishall. It should be noted that the data provided by NCC reflects what is reported to Norfolk Police.

North Walsham

- 3.91 A plan showing the extent of the accident study area for North Walsham and the accidents within it is presented in **Figure 19** below. The purple boundary indicates the study area.

Figure 19 – PIA Locations – North Walsham. Source: NCC.



3.92 A summary of the PIAs by location and severity is provided below in **Table 10** below.

Table 10 – PIA Results – North Walsham

Type	Location	Slight	Serious	Fatal	Total Accidents
Link	Kings Arms Street	0	1	0	1
Link	A149	0	2	0	2
Junction	Grammar School Road / Bank Loke	2	0	0	2
Junction	B1145 / Folgate Road	1	0	0	1
Junction	Bacton Road / Crow Road	0	1	0	1
Junction	B1145 / Lyngate Road	2	0	0	2
Junction	A149 / B1150 Norwich Road	1	0	0	1
Junction	Church Street / Hall Lane	1	0	0	1
Junction	A149 Cromer Road / A149 / B1145 / Cromer Road	1	0	0	1
Junction	B1150 / Station Road	1	1	0	2
Link	North Street	0	0	1	1
Link	Mundesley Road	1	1	0	2
Junction	Grammar School Road / Yarmouth Road	0	1	0	1
Link	B1150 Norwich Road	2	0	0	2
Link	Park Lane	1	0	0	1
Link	New Road	1	0	0	1
Link	B1145 Aylsham Road	2	0	0	2
Link	Lyngate Road	2	0	0	2
Junction	B1145 / Laundry Loke	0	1	0	1
Link	Market Place	2	0	0	2
Junction	Church Street / Bacton Road	0	1	0	1

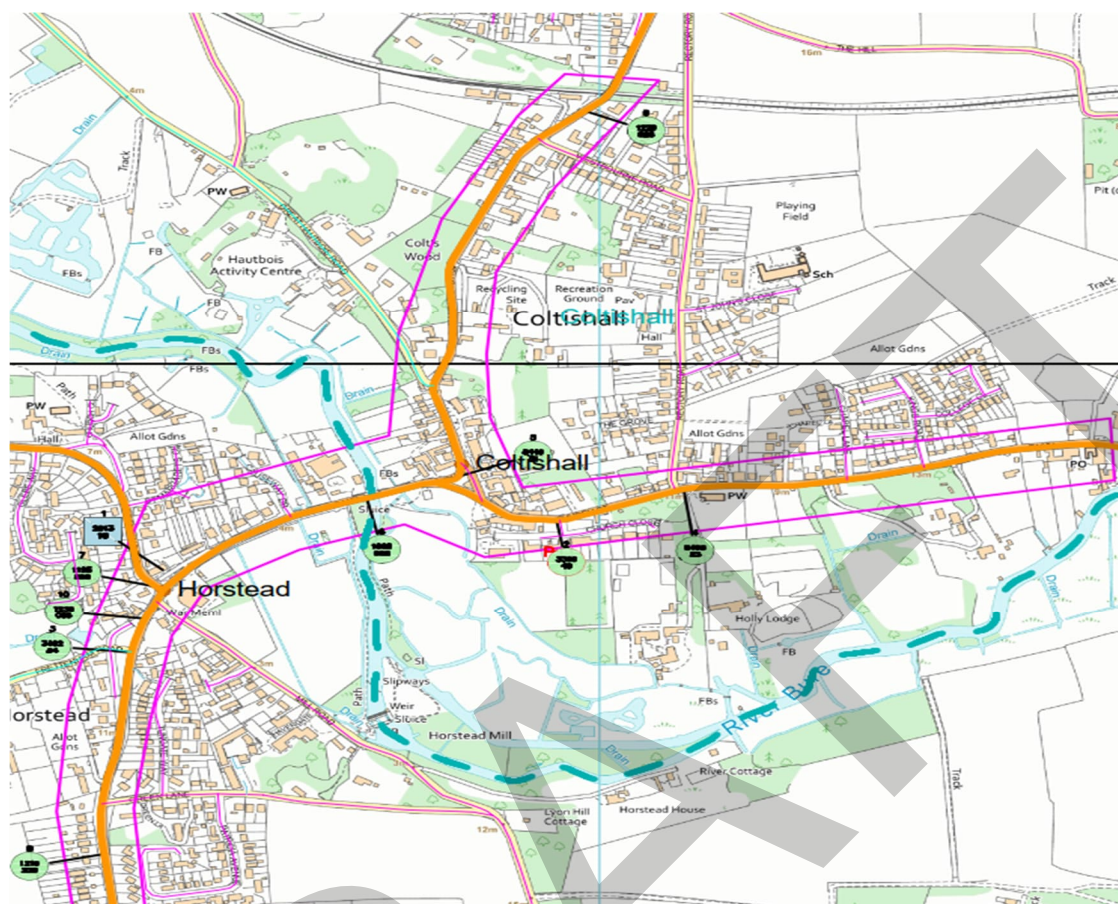
Type	Location	Slight	Serious	Fatal	Total Accidents
Link	Bank Loke	1	0	0	1
Link	New Road	0	3	0	3
Link	Aylsham Road	1	0	0	1
Junction	A149 Cromer Road / Kingsway	1	0	0	1
Link	Folgate Road	1	1	0	2
Junction	B1150 / Lammas Road	1	0	0	1
Link	Bluebell Road / Bacton Road	1	0	0	1
Link	Station Road	1	0	0	1
Link	Yarmouth Road	2	1	0	3
Total		29	14	1	44

- 3.93 A total of 44 PIAs were recorded within the study area during the five-year period assessed. Of these, 14 PIAs resulted in serious injuries and 29 PIAs resulted in slight injuries. One of the accidents was classified as fatal. No one single location saw significantly more accidents than elsewhere, with low levels of accidents occurring at multiple locations across the study area.
- 3.94 One accident which resulted in a fatality occurred on North Street in the centre of North Walsham. The accident was a collision between a car and a pedestrian. Unfortunately, the pedestrian died and from the details provided it is unclear what the causation factors for the accident were.
- 3.95 There were two accidents which occurred within proximity of the allocation land. Both accidents occurred on the B1145 Aylsham Road, approximately 25 metres west of the junction with B1145 Greens Road. The accidents were classified as slight in terms of severity, and it is noted from the available data that they occurred a day after each other. One of the accidents occurred at night and involved a car swerving to avoid hitting a deer, resulting in the car hitting a metal post and ending up in a ditch. The other was caused by a brake failure on a vehicle travelling at speed on the bend, which resulted in the driver over-correcting, and the vehicle hitting the verge, before landing in a ditch. Neither accident is considered to have occurred because of highway design.
- 3.96 One accident occurred on Aylsham Road. It was slight in severity and involved a car and a pedestrian. The driver of a recently parked car exited their vehicle and was hit by a passing car who did not have sufficient time or space to avoid the collision (based on the police report). The accident was recorded as occurring in the narrow one-way section east of the railway line, approximately 75 metres from the junction with Market Street and Cromer Road. No other accidents were recorded on Aylsham Road.
- 3.97 No accidents occurred at the locations of the new access junctions for the proposed link road or along the existing sections of carriageway which pass through the allocation site.
- 3.98 Overall, a total of 44 PIAs were recorded within the study area in the last five-year period, covering 29 slight, 14 serious, and one fatal accident. The analysis outlined above does not indicate any prevailing road safety issues in the area that need to be considered.

Coltishall

- 3.99 A plan showing the extent of the accident study area for Coltishall and the accidents within it is presented in **Figure 20** below. The purple boundary indicates the study area. Like North Walsham, the accident data was obtained from NCC and represents those accidents which have been reported to the Police during the most recent five year period.

Figure 20 – PIA Locations – Coltishall. Source: NCC



3.100 A summary of the PIAs by location and severity is provided below in **Table 11** below.

Table 11 – PIA Results – Coltishall

Type	Location	Slight	Serious	Fatal	Total Accidents
Junction	B1354 Church Street / Church Close	1	0	0	1
Junction	B1150 Norwich Road / Frettenham Road	1	0	0	1
Link	B1354 Church Street / Rectory Road	1	0	0	1
Link	B1150 High Street, near PFS	1	0	0	1
Link	B1150 Norwich Road (Coltishall)	1	0	0	1
Link	Rectory Road (Horstead)	1	0	0	1
Link	B1150 North Walsham Road	1	0	0	1
Link	B1150 Norwich Road (Horstead)	2	0	0	2
Total		9	0	0	9

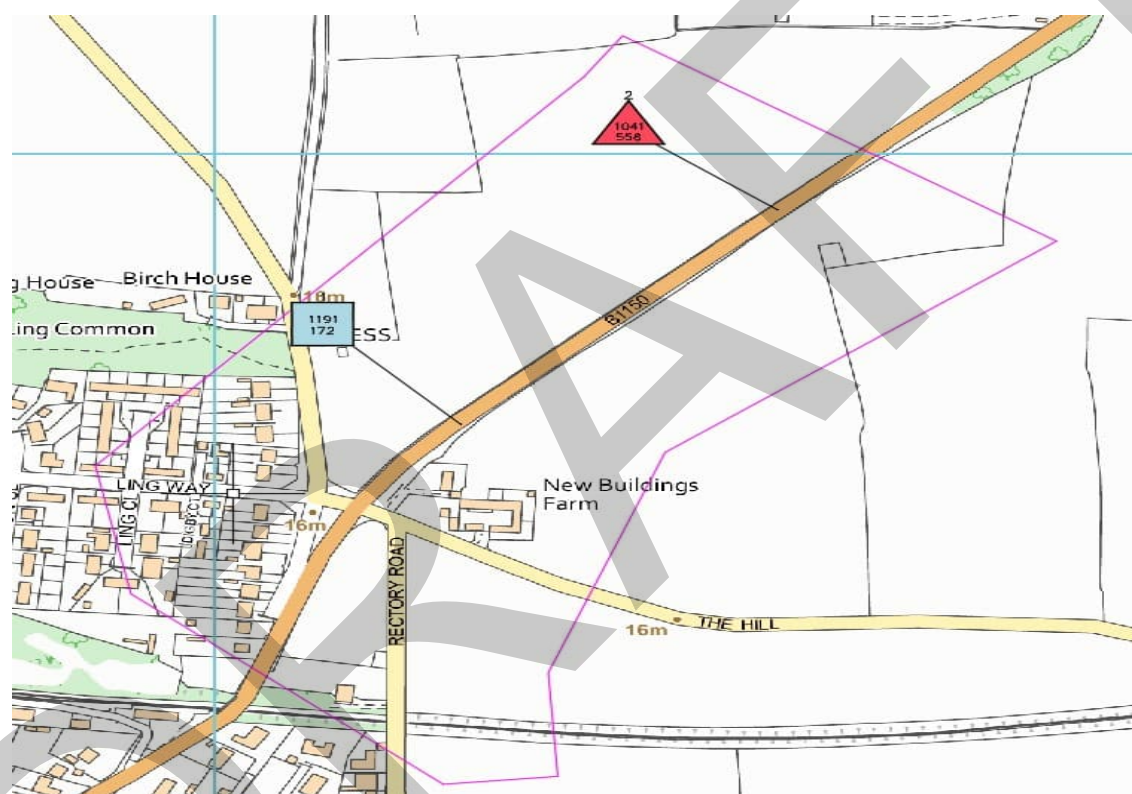
3.101 All the accidents recorded within the study area illustrated in **Figure 20** were classified as slight in terms of their severity with no serious or fatal accidents recorded within the five-year period reviewed. One accident illustrated on the plan was classified as serious however a review of the detail for the accident confirms that it did not occur at the location identified but on Coltishall Road east of Coltishall, some 2.75km from the centre of Horstead. This accident, although shown on the figure, has been discounted from the analysis.

3.102 The recorded accidents are shown to spread across the study area with the greatest number occurring in Horstead with three occurring on the B1150 between its junctions with Frettenham Road and Rectory Road, approximately 115 metres.

3.103 One accident, classified as slight in terms of severity, occurred on the B1150 near to the PFS and close to where mitigation (described later in this TA) is proposed to be undertaken. The accident involved a vehicle which had overrun the centre line and its mirror had collided with the oncoming vehicle whose driver side window was open at the time of impact.

- 3.104 A single accident within the study area was recorded as involving a pedestrian. This occurred at the junction of B1354 Church Street and Church Close where a car collided with a pedestrian when trying to pass an obstruction in the carriageway. The accident was classified as slight in terms of severity.
- 3.105 The accident recorded occurring by the river bridge on the B1150 was classified as slight in terms of severity. The details state that an ambulance on an emergency call was utilising the full width of the carriageway resulting in an oncoming vehicle misjudging the width available and reversing into the following vehicle.
- 3.106 No accidents were recorded on High Street.
- 3.107 Following discussions with BDC and the representatives of Coltishall, an additional area has been reviewed. This area covers the section of highway to the north of the railway bridge and includes B1150 North Walsham Road and its junctions with Ling Way, The Hill, and Rectory Road. **Figure 21** below illustrates the accidents which have been reported to the Police in the last five-year period in this area.

Figure 21 – Additional PIA Locations – Coltishall. Source: NCC



- 3.108 This illustrates that two accidents were recorded, one was classified as serious and involved a motorcycle colliding with slowing traffic in a southbound direction whilst the second accident, unfortunately resulted in a fatality. The accident which is shown to have occurred on the B1150 North Walsham Road, approximately 450 metres north of the junction with Ling Way, involved a cyclist colliding with the rear of a stationary vehicle. No further accidents were recorded in this area.

Baseline Modelling

- 3.109 As part of early discussions with NCC, it was agreed that it would be more beneficial in identifying the impact of the allocation for a micro-simulation model be built for North Walsham using VISSIM software. A SATURN model had been built previously for North Walsham for high level work undertaken by NCC however this was not found to be acceptable for use for assessing the impact of the allocation given that it was high level, built for a strategic purpose, and based on information collated during the Covid-19 pandemic.
- 3.110 In addition to the VISSIM model for North Walsham, at the request of NCC and NNDC, a separate VISSIM model has been built for Coltishall to allow identification of the impact of the allocation on the village. Although Coltishall is circa 11km from the allocation site it is considered that the impact of the proposed allocation is such that mitigation may be required.

- 3.111 The existing conditions in North Walsham and Coltishall were replicated using the extensive data set and geometric information to reflect the existing road network conditions using VISSIM. VISSIM is a very useful tool to model accurately non-standard road layouts, such as in market towns like North Walsham and villages like Coltishall. Equally it is a tool that can reflect behaviour across the road network, allowing traffic to redistribute depending on conditions, where route choice exists. It also allows for the interaction of traffic between junctions.
- 3.112 For each of the VISSIM models built, a Local Model Validation Report (LMVR) has been prepared. The LMVR documents the data collection and analysis, the development of the network and the base year demand along with the calibration / validation details. A copy of the LMVRs prepared for North Walsham and Coltishall are included at **Appendix D**.
- 3.113 The LMVR for North Walsham concludes that:
- The town experiences some congestion around the signalised junctions and the town centre roads with queues often building up in these areas during the AM and PM peak times. However, these queues are not too extensive with vehicles usually progressing through signalised junctions in a single cycle, with minimum impacts on nearby junctions.
 - The base models have been calibrated and validated against the observe traffic flow and journey time data in line with the required criteria set out in DfT TAG and best practice. The calibration / validation results exceed the requirements for turning counts and journey times and the models are therefore closely alignment with observed data. The models also replicate observed queuing patterns and specific behaviours observed from video footage.
 - The base models therefore provide a close representation of the queues and delays in the North Walsham network as well as the observed driver behaviour and are fit for purpose of testing future traffic levels / patterns or potential changes to the road network.
- 3.114 The LMVR for Coltishall concludes that:
- In the AM period, there is a small amount of congestion on the eastbound approach to the PFS due to the vehicles waiting to turn right into the B1354 whilst in the PM period parked vehicles on the B1150 High Street, adjacent to the war memorial were seen to cause a significant amount of queuing, particularly in the southbound direction due to the blocking of through traffic.
 - The base models have been calibrated and validated against the observed data in line with the required criteria. The calibration / validation results exceed the requirements for turning counts and journey times and the models are therefore closely aligned with observed data. The models also replicate observed queuing and patterns well. The models are therefore validated to industry standard guidelines.
 - The base models provide a close representation of the queues and delays in the networks as well as the observed driving behaviours in the area and are fit for the purpose of testing future traffic levels / patterns or potential changes to the road network.
- 3.115 Both models have also taken account of the on-street parking, courtesy/give-way behaviours, restrictions on route choice and narrowings to the carriageways to ensure that vehicular flow within North Walsham and Coltishall is as representative as it is daily.
- 3.116 The base models for North Walsham and Coltishall have therefore been taken forward and utilised in the assessment of the allocation's impact on the road network in each location.

4. Development Proposals

Introduction

4.1 This chapter provides an outline of the allocation proposals, including access, and car and cycle parking.

Development Proposals

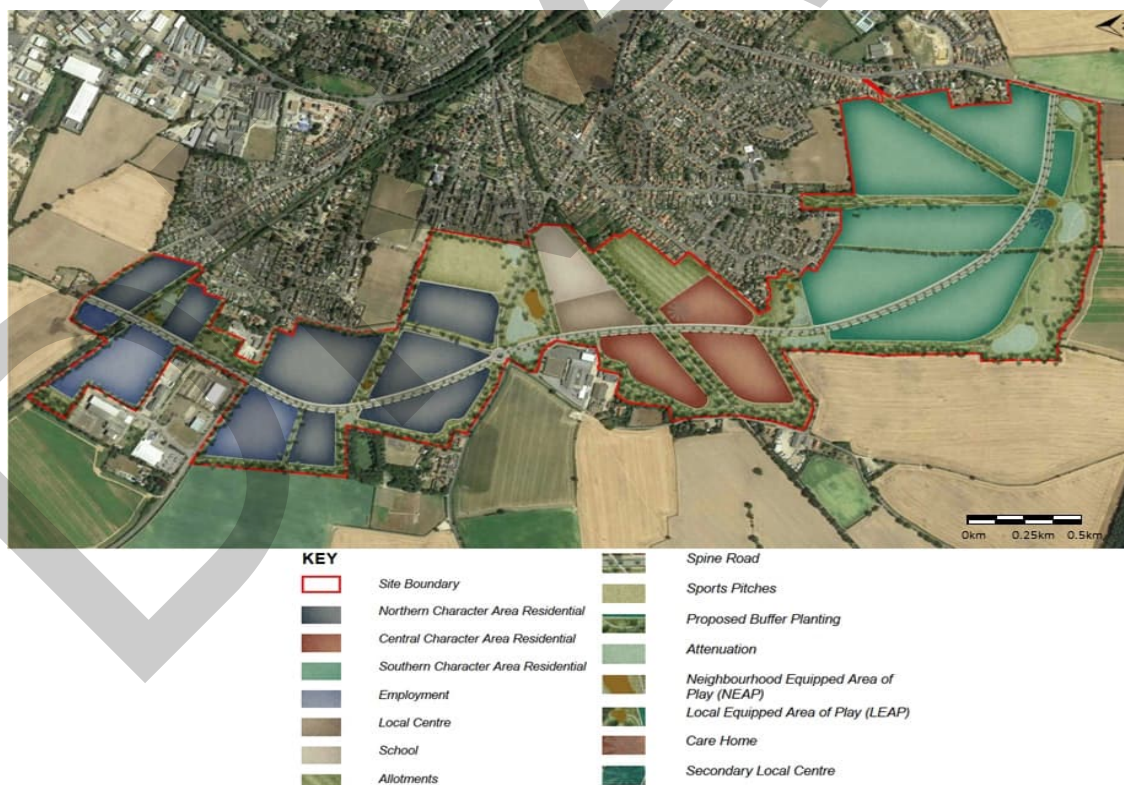
4.2 As set out in Chapter 1, the allocation is located on 108.3ha of land to the west of North Walsham, and predominantly used for agricultural purposes. The site location within North Walsham is illustrated in **Figure 1**.

4.3 The allocation as set out in the policy (NW62/A) would provide:

- Approximately 1,800 dwellings.
- 7ha of serviced employment land.
- Green infrastructure.
- Community facilities, including a new primary school.
- A road linking Norwich Road, Cromer Road, and the industrial estate.

4.4 An indicative layout identifying land parcels and their potential uses is shown in **Figure 22** below and the indicative masterplan is included in **Appendix A**.

Figure 22 – Indicative Layout



Source: Bidwells, Development Brief

Phasing

- 4.5 The Housing Trajectory from the emerging NNDC Local Plan has been considered realistic in terms of the housing delivery rate for the allocation. It is based on two developers producing approximately 50 dwellings per annum, with the additional delivery of a 60-bed care facility in 2029/30, 2032/33, and 2035/36. The Housing Trajectory has been replicated in **Table 9** below. This has been utilised for determining the number of dwellings likely to come forward in the first assessment year however it is noted that the final number in each year is subject to change and further review by NNDC.

Table 12 – Housing Trajectory from Emerging NNDC Local Plan for Allocation NW62/A

	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036+
Units	30	60	100	160	100	100	160	100	100	160	1037
Cumulative Total	30	90	190	350	450	550	710	810	910	1070	2107

Link Road and Junctions

- 4.6 As part of the allocation proposals, several highway infrastructure improvements are proposed, these include:

- A new link road connecting A149 Cromer Road and B1150 Norwich Road;
- A new four arm roundabout on the A149 Cromer Road at the current junction with Bradfield Road, which will provide the fourth arm;
- A new three arm roundabout on the B1150 Norwich Road;
- A new staggered signalised junction where the link road connects with B1154 Aylsham Road with pedestrian and cyclists crossing facilities. This is aimed at breaking the through route along Aylsham Road to reduce through vehicle speeds, and to discourage through traffic from using Aylsham Road;
- Pedestrian and cyclist facilities will be provided along the length of the link road. These will be provided in accordance with LTN 1/20;
- Vehicular through traffic will be prohibited on Skeyton Road at the point where it crosses the link road. Pedestrian and cyclist access along Skeyton Road will be maintained. This is to discourage through traffic on Skeyton Road which serves as a local access road to existing residences;
- Greens Road will be maintained up to the boundary of the existing residential development, after this point the road will be stopped up;
- A new vehicular access to the Football Club would be provided from the link road reducing reliance on Greens Road and connecting the Football Club with the new Development area;
- Realignment of the carriageway at the B1154 Aylsham Road / Tungate Road junction to enable provision of the staggered signalised junction;
- Access for residential parcels north of the railway line provided along Bradfield Road; and
- Widening of Bradfield Road with HGV access available for the section between the new four-arm roundabout and the plot immediately southwest of the railway bridge to allow access to the employment area. HGV access beyond this point will be restricted, as at present. The carriageway width on Bradfield Road north over the railway bridge and along the allocation site frontage will remain as at present, with land provision for future widening if a northern extension of the link road to the North Walsham Industrial area comes forward to its existing width and signage as per that provided currently on Bradfield Road.

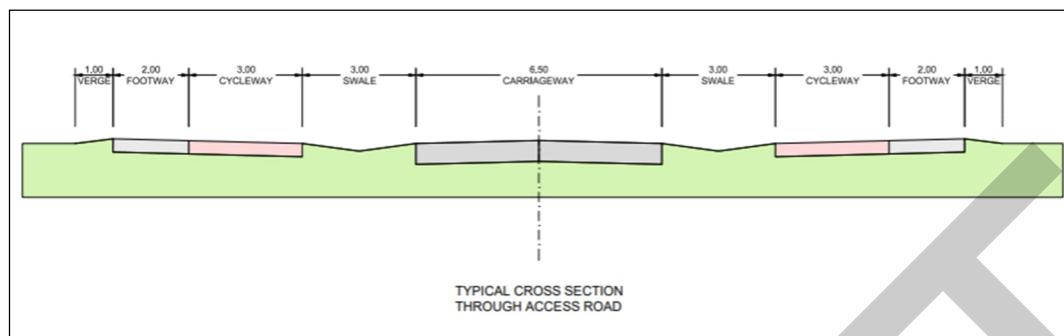
- 4.7 The design parameters for the link road have been based on the required technical design standards and feedback from NCC who were consulted as part of the development process. **Table 13** below sets out the design parameters established for the link road the proposed junctions at A149 Cromer Road, B1145 Aylsham Road, Skeyton Road, and B1150 Norwich Road.

Table 13 – Design Parameters for the Link Road

Parameter	Design Brief	Achieved Design Parameter
Design Code	DMRB CD 109	DMRB CD 109 Table 2.10
Design Speed	30mph (70kph)	40mph (70kph), with speed reducing curves. Proposed speed limit set to 30mph, with 20mph zone in place in front of school and local centre
Road classification	'B' class road	
Road type	Single carriageway to DMRB Cycleway and footways to LTN 1/20	Single carriageway 6.5 wide 2 x 3m wide cycleways (1 each side) 2 x 2m wide footways (1 each side) 2 x 3m swales (1 each side) 2 x 1m grass verges (1 each side)
Roundabouts	Designed to DMRB CD 116 Geometric Design of Roundabouts	
A149 / Link Road		Designed to DMRB CD 116 50m ICD (subject to further modelling) 2 lane approaches on A149 east and west arms, link road south arm 1 approach on Bradfield Road
B1150 / Link Road		Designed to DMRB CD 116 50m ICD (subject to further modelling) 2 lane approaches on B1150 north and south arms, link road west road
Junctions	Designed to DMRB CD 123 Geometric design at-grade priority and signal-controlled junctions	
B1145 Aylsham Road / Link Road		Designed to DMRB CD 123 Signal controlled staggered crossroads junction (subject to further modelling) 2 land approaches on each arm
Pedestrian / Cycle Crossings	Designed to LTN 1/20 Cycle Infrastructure Design	Designed to LTN 1/20
Weavers Way / Link Road	Uncontrolled Parallel Crossing as requested by the PRow team.	Parallel Crossing

4.8 This illustrates that the link road through the allocation would be provided in accordance with the requirements of DMRB and LTN 1/20. Further detailed design of the link road in accordance with the guidance will be undertaken as the project moves forward.

4.9 An indicative cross section for the proposed link road through the development site is illustrated in **Figure 23** below.

Figure 23 – Indicative Link Road Cross Section

Sustainable Transport Facilities

- 4.10 The new road will also be an attractive main residential street through the allocation, balancing the needs of traffic and active travel. The internal layout will be designed such that vehicles are directed to A149 Cromer Road to the north and B1150 Norwich Road to the south, ensuring the link road is the main pedestrian and cycle corridor.
- 4.11 The proposed link road is being designed to physically accommodate buses and HGVs, to ensure the site is permeable to public transport, and to provide a suitable HGV route for north south HGV traffic to the west of North Walsham.
- 4.12 Facilities for pedestrians and cyclists will be provided within the allocation in accordance with the requirements set out by LTN 1/20 as per **Table 13**. These include two-metre footways and three-metre cycleways provided along the link road and Tiger crossings provided along the access road where routes cross the link road. This will designate an active travel corridor, with allowance for pedestrians and cyclists, segregated from motorised traffic. The connections and improvements are set out in the Sustainable Access Strategy.
- 4.13 Bus stops and a bus interchange will be provided within the allocation to assist with bus-based travel whilst the pedestrian and cycle routes to the train station will be improved to encourage travel by train.
- 4.14 Further detail relating to the Sustainable Transport Strategy for the allocation is set out in **Chapter 5**.

Community Facilities

- 4.15 A new two-form entry primary school will be a core component of the masterplan. The school is broadly located at the centre of the site, alongside the local centre and allotments to create a hub of local services for the allocation. Further to this, additional facilities will be provided within the Local Centre which have not yet been confirmed.
- 4.16 Additionally, sports provision is proposed and is to be located adjacent to the existing North Walsham Town Football Club, in line with the site allocation policy.
- 4.17 Employment land has also been identified, focused on the northern section of the allocation.

Parking

Car Parking

- 4.18 Car parking provision for the allocation will be provided in accordance with the guidelines applicable at the time. The current parking standards are set out in NCC's 'Parking Guidelines for New Developments in Norfolk' (2022) document. The relevant car parking standards for the uses anticipated at the allocation are set out in **Table 14**.

Table 14 – NCC Car Parking Standards (2022)

Use Class	Car Parking Standard	Accessible Parking
Offices, Research & Light Industry	1 space per 30m ²	200 vehicle bays or less = 2 bays or 6% of total capacity
General Industrial		Over 200 vehicle bays = 6 bays plus 2% of total capacity
Storage and Distribution	1 space per 150m ²	
Residential 1 bedroom unit	1 space per dwelling	
Residential 2- or 3- bedroom unit	2 spaces per dwelling	Individual merit
Residential 4 or more- bedroom unit	3 spaces per dwelling	
Primary School	1 space per 1 full-time teaching staff + 1 space per classroom, plus provision for public/school transport	1 bay or 6% of total capacity, whichever is greater

- 4.19 The parking standards for residential development are minimums whilst other uses are recommended standards which should be applied. The guidance states that parking at destinations should be constrained to encourage greater use of more sustainable modes of transport whilst parking at origins should be provided to ensure that there is sufficient to cater for car ownership levels.

Electric Vehicle Provision

- 4.20 For the Government to reach its 'Road to Zero' goal involving the ending the sale of new petrol and diesel vehicles by 2035, new developments will require electric car chargers by law. The allocation will seek to maximise provision for electric vehicles with provision made for charging vehicles in all areas of the site. The exact nature of the provision will be identified at the time of any application but will be in line with at least the guidance current at the time.

Powered Two-Wheeler Parking

- 4.21 Powered Two-Wheeler (PTW) parking provision for the allocation will be provided in accordance with the guidelines applicable at the time of application. NCC's 'Parking Guidelines for New Developments in Norfolk' (2022) document is the current guidance document and the relevant PTW parking standards for the uses anticipated within the allocation are set out in **Table 15**.

Table 15 – NCC PTW Parking Guidelines (2022)

Use Class	PTW Parking Standard
Offices, Research & Light	
General Industrial	1 space, + 1 per 20 car spaces (for 1 st 100 car spaces) then 1 space per 30 car spaces (over 100 car spaces)
Storage and Distribution	
Residential 1 bedroom unit	
Residential 2- or 3- bedroom	N/A
Residential 4 or more-	
Primary School	1 space + 1 per 20 car spaces (for 1 st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)

Cycle Parking

- 4.22 Cycle parking provision for the allocation will be provided in accordance with the guidelines applicable at the time of application. This is currently NCC's 'Parking Guidelines for New Developments in Norfolk' (2022) document. The relevant cycle parking standards for the uses anticipated at the allocation are set out in **Table 16**.

Table 16 – NCC Cycle Parking Guidance (2022)

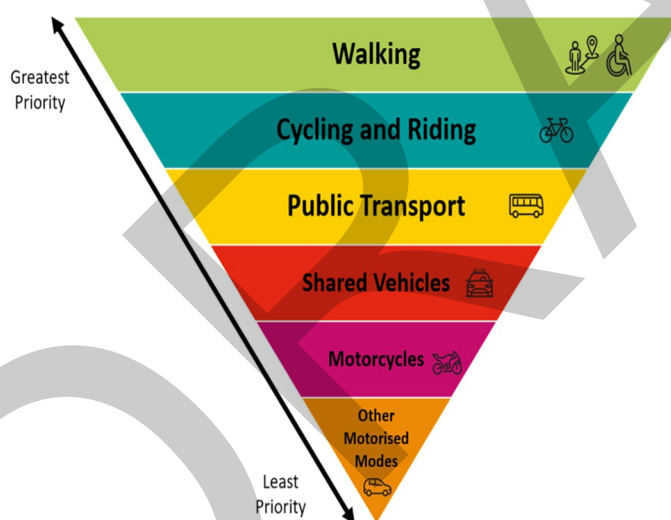
Use Class	Cycle Parking Standard
Offices, Research & Light Industry	1 space per 100m ² for staff plus 1 space per 200m ² for visitors
General Industrial	
Storage and Distribution	1 space per 500m ² for staff plus 1 space per 1000m ² for visitors
Residential 1 bedroom unit	
Residential 2- or 3-bedroom unit	4.23 2 secure covered spaces per dwellings. None if garage or secure area is provided within curtilage of dwelling
Residential 4 or more-bedroom unit	
Primary School	1 space per 5 staff plus 1 space per 10 pupils

5. Sustainable Transport Strategy

Introduction

- 5.1 This section outlines the proposed sustainable transport strategy for the allocation, including a review of the existing facilities to key locations in North Walsham, identifying any deficiencies, and potential improvements which could be implemented to increase the use of active and sustainable travel for the allocation.
- 5.2 The existing baseline conditions for walking, cycling, and public transport have been discussed in detail in the **Existing Conditions** section.
- 5.3 The design ethos behind the transport strategy for the allocation aims:
- To enable safe, direct, and accessible movement for people throughout and, to and from, the allocation site.
 - To provide options for travel in line with urban transport hierarchy for the private car.
 - The design of all proposed infrastructure to correspond with the latest policy and guidance document (e.g., Manual for Streets, DMRB, LTN 1/20).
- 5.4 The urban transport hierarchy prioritises walking, cycling, and public transport over single occupancy private car trips. This is the guiding philosophy behind the transport strategy for the allocation. The hierarchy is illustrated on **Figure 24**.

Figure 24 – Mode of Transport Hierarchy



- 5.5 This has been considered, alongside the following three stage approach to identifying the transport strategy for the allocation:
- Stage 1 – Limit the need for Travel.
 - Create neighbourhoods.
 - Provide access to local services.
 - Provide for digital needs to minimise the need for travel.
 - Stage 2 – Promote Sustainable Travel
 - Provide for sustainable travel for all trips.
 - Promote sustainable through a TP and Demand Management
 - Stage 3 – Cater for the highway residual capacity needs to ensure safe operation of the road network.

- 5.6 The strategy set out in the following sections is a result of considering the transport hierarchy and three stage approach with respect to the existing conditions within North Walsham.

Walking and Cycling Strategy

Desire Lines

- 5.7 This section outlines the internal and external desire lines for movement from proposed allocation land to key destinations.

Internal

Residential to Commercial

- 5.8 The residential-to-commercial desire lines are shown in **Figure 25** below.

Figure 25 – Internal Desire Lines - Residential to Commercial



- 5.9 The onsite desire lines generally run in a north-south direction and follow the route of the link road.
- 5.10 Some of the residential parcels in the southern section of the allocation have a desire line through the existing residential area in the west of North Walsham, such as through South Rise, Skeyton Road, and Station Road. The indicative routes from these parcels would be through the potential connection onto South Rise, then Station Road, and Aylsham Road, connecting onto the link road to the employment areas.

Residential to Local Centre/School

- 5.11 The residential to local centre and school desire lines are shown in **Figure 26** below.

Figure 26 – Internal Desire Lines - Residential to Local Centre and School



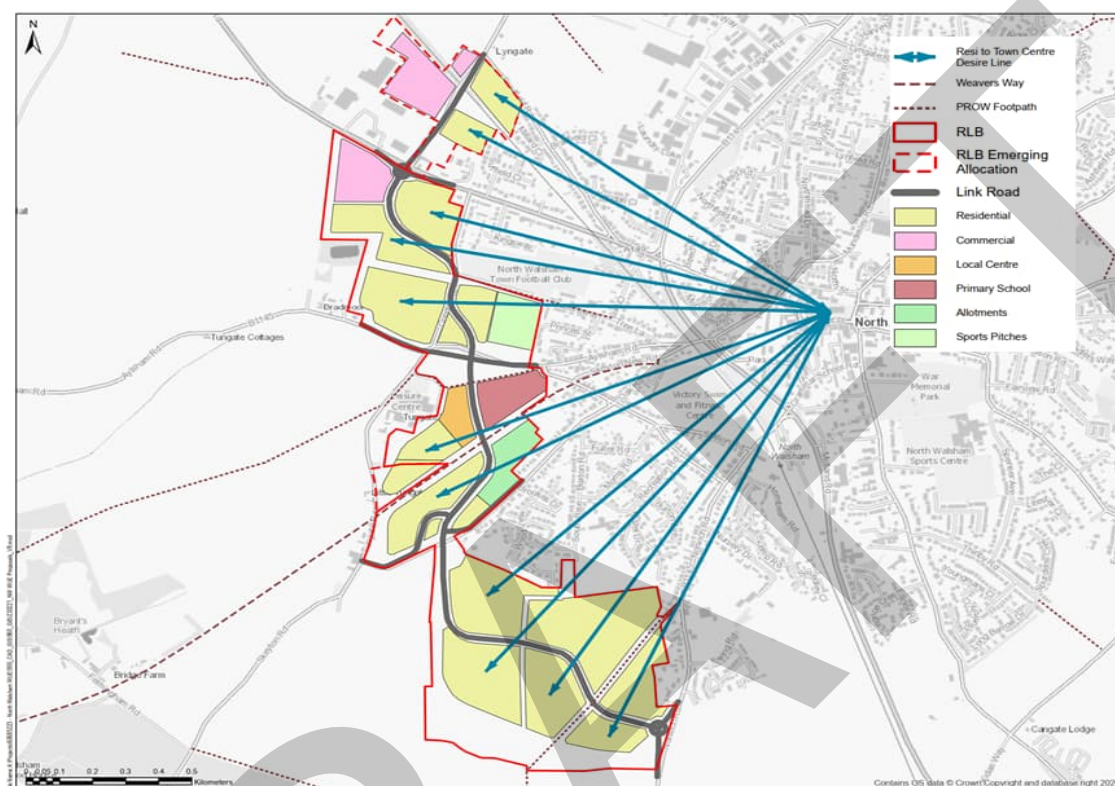
5.12 The desire lines broadly run in a north-south direction, except for the residential parcels in the central section which broadly run in an east-west direction. The residential parcels in the northern section of the development's desire lines run through Kingsway and North Walsham Town Football Club, with an alternative provided along the link road to the west. Some residential parcels in the southern section of the allocation's desire lines run through the residential area adjacent to the site. There is an alternative route along the link road to the west.

External

Residential to Town Centre

5.13 The residential to town centre desire lines are shown in **Figure 27** below.

Figure 27 – External Desire Lines - Residential to Town Centre

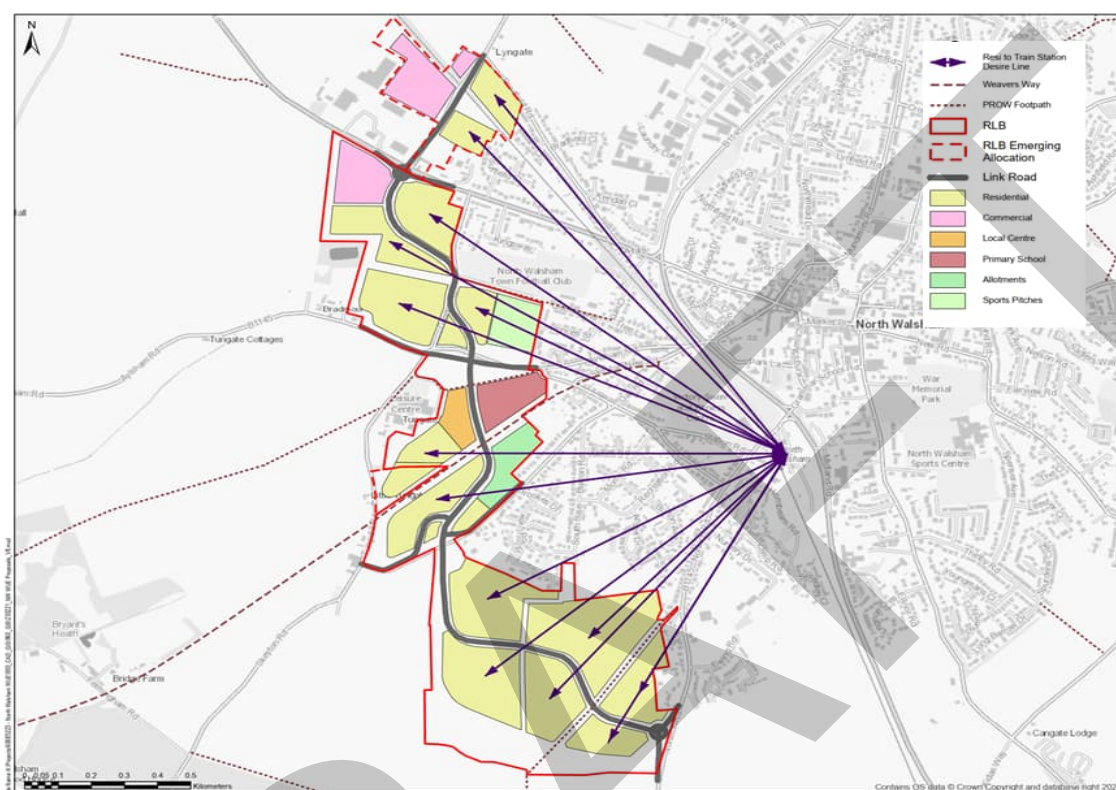


- 5.14 The desire lines from the residential parcels to the town centre vary across the allocation. In the southern section of the allocation, the desire lines run in a northeast-southwest direction, through the residential areas off Station Road, across the railway. Due to the railway line, the most direct route would be along B1150 Norwich Road and into the town centre along Grammar School Road.
- 5.15 The desire lines for the central section of the allocation run generally in an east-west direction. The two residential parcels' desire lines run along Skeyton Road and Oak Road before crossing the railway line. Weavers Way runs directly along the desire line most central to the site.
- 5.16 The desire lines for the northern section of the allocation run almost parallel to A149 Cromer Road, with a suitable option being along Bradfield Road and A149 Cromer Road into the town centre.

Residential to Rail Station

- 5.17 The desire lines for movement between the residential areas to North Walsham rail station desire lines can be seen in **Figure 28** below.

Figure 28 – External Desire Lines - Residential to Train Station

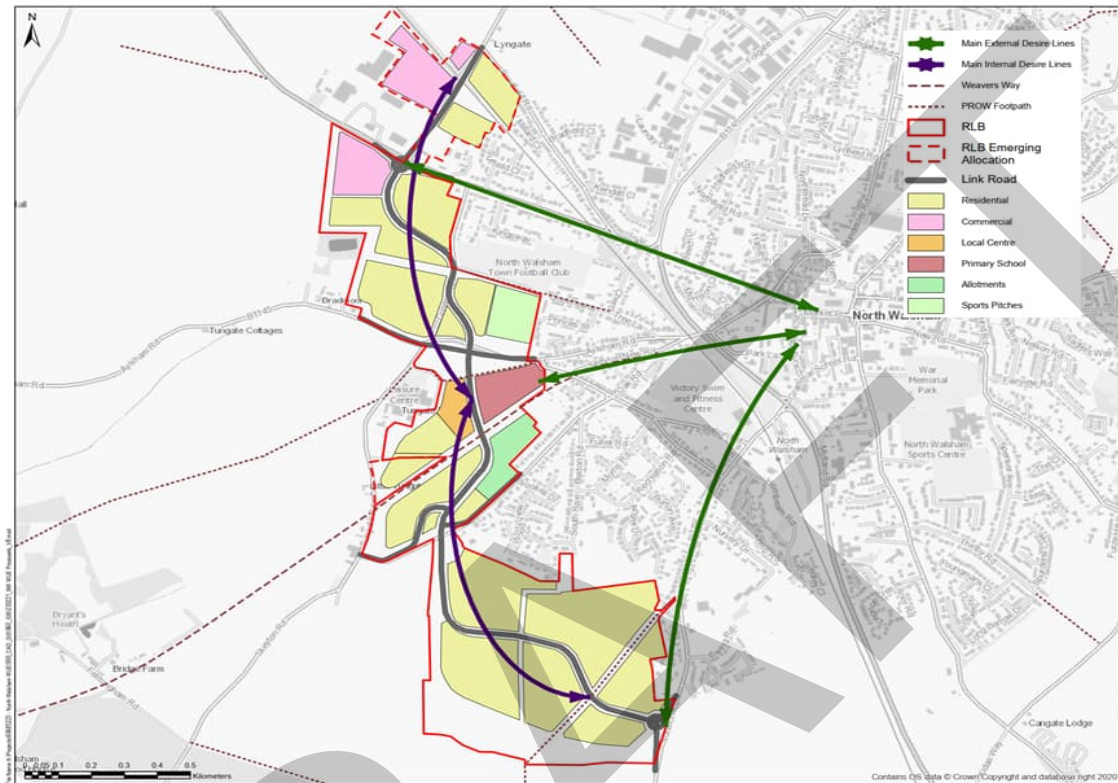


- 5.18 The desire lines to the rail station from the residential parcels vary depending on the section of the allocation. The southern section's desire lines run in a northeast-southwest direction, with several of the desire lines running along B1150 Norwich Road, which is a potential route to the rail station. An alternative route for the residential parcels located in the west of the southern section could be along South Rise, Recreation Road, and Millfield Road.
- 5.19 From the central section of the allocation, the desire lines run directly in an east-west direction, through the existing residential area to the east of the central section. There is no direct route along these desire lines, with the most suitable alternative being along Skeyton Rd, Skeyton New Road, Station Road, and B1150 Norwich Road. An alternative is also Weavers Way which connects to an existing north south route along the A149 North Walsham Bypass connecting to the station.
- 5.20 The northern section of the allocation has two desire lines to the train station. These desire lines run parallel to the railway line, with an almost unobstructed route along the footpath which runs adjacent to A149 North Walsham Bypass. This would be a suitable route to the train station.

Summary

- 5.21 In summary, the main pedestrian and cycle desire lines for the allocation site are shown below in **Figure 29**.

Figure 29 – Main Internal and External Desire Lines



- 5.22 From a review of the desire lines internal and external to the allocation, there are three defined corridors for journeys external to the allocation and one within the site. The desire line within the site generally follows the alignment of the link road whilst the three main external desire lines follow the corridors along the A149 Cromer Road, Aylsham Road, and B1150 Norwich Road.

Off-Site Walking and Cycling Strategy

Key Pedestrian Routes

- 5.23 The existing pedestrian routes to the town centre, train station, and high school, as three key destinations have been assessed with the aim of identifying any deficiencies which need to be addressed, opportunities for improvement or barriers preventing a route from being suitable.
- 5.24 **Table 17** below identifies the opportunities for improvement along the key existing pedestrian routes. The key to **Table 17** is as follows:

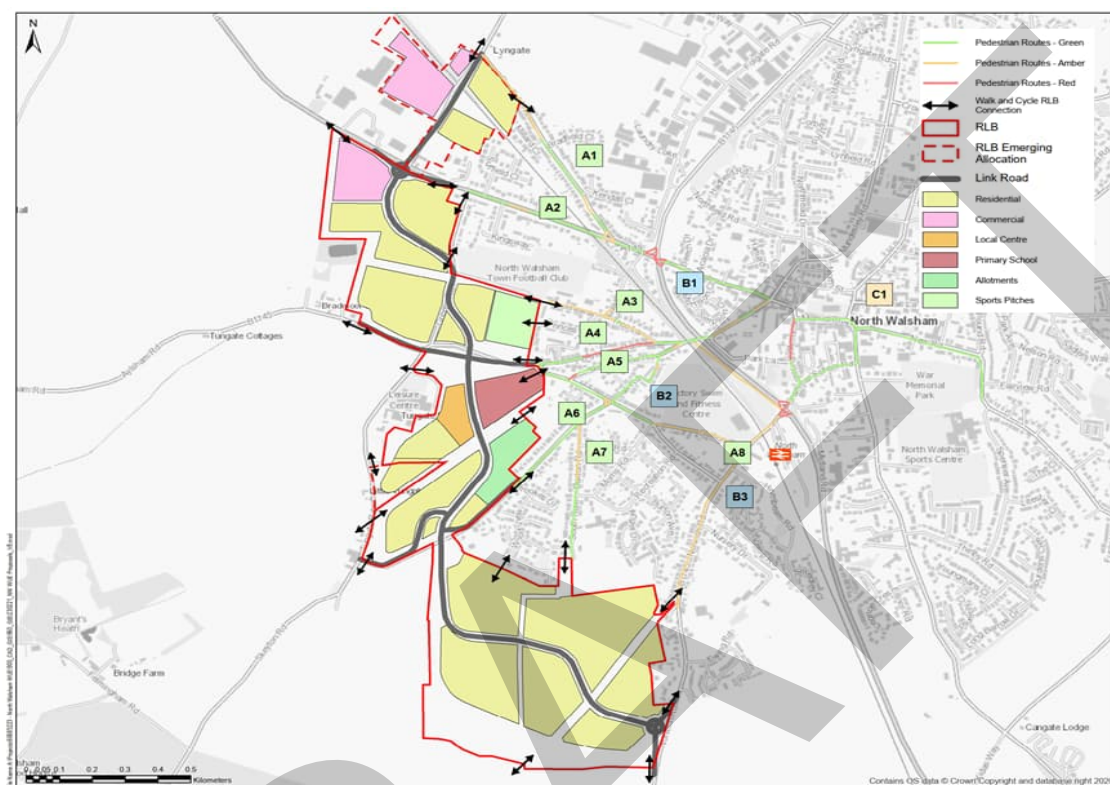
No Issue	Moderate Issue	Significant Issue
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Table 17 – Existing Pedestrian Route Opportunities for Improvement

Destination	Route	Map Ref.	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	
Town Centre (Market Place)	Bradfield Road – Cromer Road	A1	Bradfield Road: Sections with missing footway on north and south sides of the highway		Bradfield Road / Cromer Road junction: Unclear pedestrian crossing location	Cromer Road / NW Bypass signalised junction: Pedestrians must cross in multiple sections. Only part of one of the crossings is signalised for pedestrians			
	Cromer Road	A2	Cromer Road: Section of missing footway on south side of the highway	Cromer Road: Pedestrians must cross the busy A149 – limited crossing facility					
	Queensway – Cherry Tree Lane – Aylsham Road	A3	Queensway: Section of missing footway on north side of the highway.	Queensway / Cherry Tree Lane junction: Pedestrians must cross here – unclear crossing location and limited visibility	Cherry Tree Lane: Section of missing footway on south side of the highway				
	Aylsham Road	A4	Aylsham Road: Section of missing footway on both sides of the highway – pedestrians are required to walk on the carriageway				Aylsham Road: Sections with missing footway on south side of the highway	Aylsham Road: Section with very narrow footway on north side of the highway	
	Weavers Way – Skeyton New Road – Aylsham Road	A5	Weavers Way: narrow route, surface is not asphalt, not overlooked, shared with cycles	Weavers Way at Station Road: No crossing facility to continue Weavers Way					
	Skeyton Road – Oak Road – Skeyton New Road – Aylsham Road	A6			Skeyton Road / Oak Road junction: Unclear crossing location	Oak Road: section of missing footway at north end of route – pedestrians are required to walk on the carriageway (quiet road)	Skeyton New Road / Aylsham Road junction: Pedestrians must cross here - limited crossing facility and visibility		
	South Rise – Buxton Road – Skeyton Road – Oak Road – Skeyton New Road – Aylsham Road	A7	South Rise: Section of missing footway on west side of the highway						
	Norwich Road – King's Arms Street	A8	Norwich Road: Vehicles parked on the footway in all years available on Google Street View, limiting or blocking pedestrian movement.	Norwich Road: Section of missing footway on west side of the highway	Norwich Road / NW Bypass signalised junction: Pedestrians must cross in multiple sections. Only one crossing is signalised for pedestrians	King's Arms Street: Section with no or very narrow footways on both sides of the highway. (An alternative route of a similar distance is however available via Grammar School Road and Bank Loke)			
Rail Station	Shared Facility on Bypass (join from Cromer Road or Aylsham Road)	B1	Cromer Road / NW Bypass signalised junction: Pedestrians must cross in multiple sections. Unsignalised for pedestrians making the crossing to / from the shared facility	Shared facility alongside bypass: narrow route, unbound surface, not overlooked, shared with cycles	Shared facility along bypass at Aylsham Road: Pedestrians must cross here – limited crossing facility and visibility	Norwich Road / NW Bypass signalised junction: Pedestrians must cross in multiple sections. Unsignalised for pedestrians making the crossing to / from the rail station			
	Station Road – Norwich Road (join from Aylsham Road, Weavers Way or Skeyton Road)	B2	Station Road: Sections with missing footway on one side of the highway						
	Norwich Road	B3	Norwich Road: Parked cars on footway	Norwich Road: Section of missing footway on west side of the highway	Footway on Norwich Rd under railway bridge is narrow. No scope to widen. Station access constraints increase use of this footway				
High School	New Road (join from Market Place or Yarmouth Road)	C1	N/A						

5.25 The opportunities for pedestrian improvements have been mapped to outline the locations where proposed improvements should be focussed. The locations where there are no, moderate, and significant issues can be seen in **Figure 30** below.

Figure 30 – Pedestrian Routes RAG



5.26 It should be noted that there are additional / alternative connections which can be made to the adjacent residential areas which will be reviewed in further detail. These connections will not just assist in connecting the development with the town but enable existing residents to utilise the facilities proposed on the allocation land such the school, local centre, and bus interchange.

Key Cycle Routes

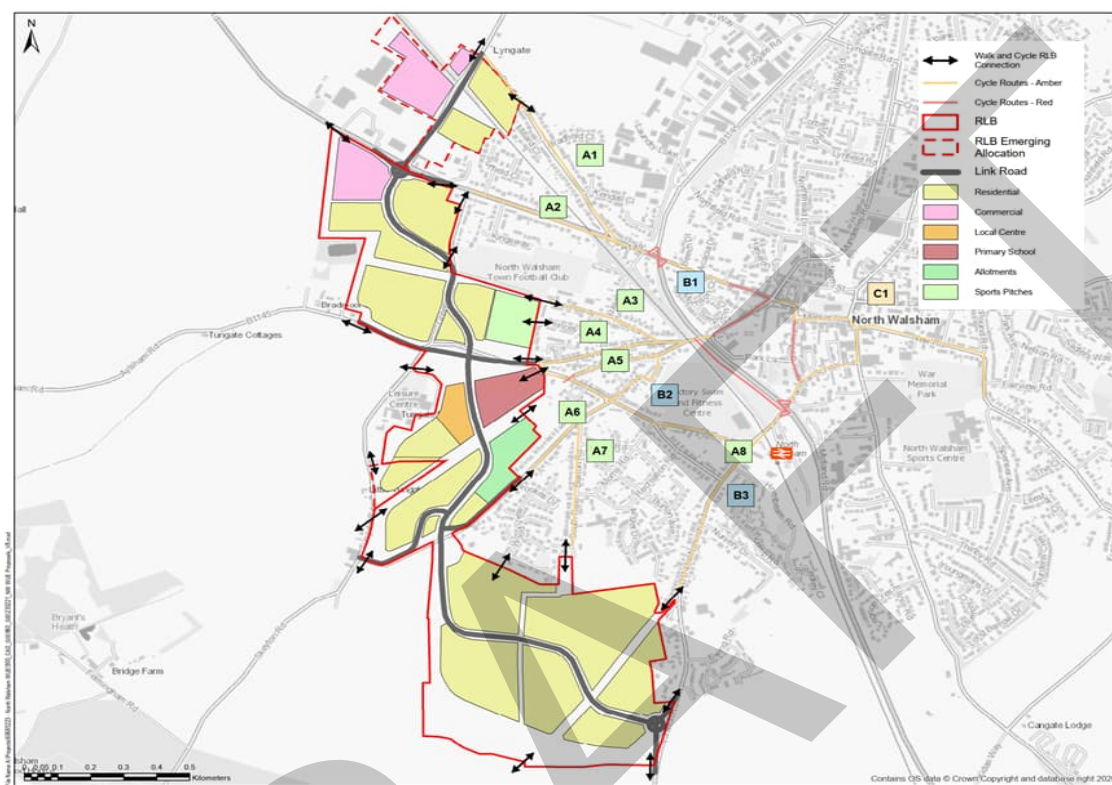
5.27 The key cycle routes to the town centre, train station, and high school from the indicative connection points from the allocation have also been assessed and **Table 18** below identifies the opportunities for improvement along these key existing cycle routes. The key is the same as that utilised for **Table 17**.

Table 18 – Existing Cycle Route Opportunities for Improvement

Destination	Route	Map Ref.	Issue 1	Issue 2	Issue 3	Issue 4	Issue 5	Issue 6
Town Centre (Market Place)	Bradfield Road – Cromer Road	A1	No dedicated cycle facilities on route	Cromer Road near Market Street: One-way street – outbound direct route is not possible				
	Cromer Road	A2	No dedicated cycle facilities on route					
	Queensway – Cherry Tree Lane – Aylsham Road	A3	No dedicated cycle facilities on route	Cherry Tree Lane / Aylsham Road junction: Junction with limited visibility				
	Aylsham Road	A4	No dedicated cycle facilities on route	Aylsham Road: Section of missing footway on both sides of the highway – mix with pedestrians and vehicles				
	Weavers Way – Skeyton New Road – Aylsham Road	A5	Weavers Way (shared facility): narrow route, unbound surface, not overlooked, shared with pedestrians	Weavers Way at Station Road: barrier requiring dismounting, and no crossing facility	Weavers Way / Skeyton New Road junction: Tie in with road is narrow, has a chicane, limited visibility	Skeyton New Road / Aylsham Road junction: limited visibility	Aylsham Road: Section under bridge may have oncoming vehicles in middle of road.	Aylsham Road near Market Street: One-way street – outbound direct route is not possible
	Skeyton Road – Oak Road – Skeyton New Road – Aylsham Road	A6	No dedicated cycle facilities on most of the route	Oak Road: Twisty route, potentially unclear				
	South Rise – Buxton Road – Skeyton Road – Oak Road – Skeyton New Road – Aylsham Road	A7	No dedicated cycle facilities on most of the route					
	Norwich Road – King's Arms Street	A8	No dedicated cycle facilities on route	King's Arms Street: One-way street – inbound direct route is not possible.				
Rail Station	Shared Facility on Bypass (join from Cromer Road or Aylsham Road)	B1	Cromer Road / NW Bypass signalised junction: No facility at signalised junction to enable cycles to join the shared foot/cycleway from the road	Shared facility alongside bypass: narrow route, unbound surface, not overlooked, shared with pedestrians	Shared facility alongside bypass at Aylsham Road: Crossing is narrow, has a chicane, limited visibility	Norwich Road / NW Bypass signalised junction: No facility at signalised junction to enable cycles to either join the shared foot/cycleway from the road or cross the junction		
	Station Road – Norwich Road (join from Aylsham Road, Weavers Way or Skeyton Road)	B2	No dedicated cycle facilities on route					
	Norwich Road	B3	No dedicated cycle facilities on route					
High School	New Road (join from Market Place or Yarmouth Road)	C1	No dedicated cycle facilities on route					

- 5.28 The opportunities for cyclist improvements have been mapped to outline the locations where proposed improvements should be focussed. The locations where there are no, moderate, and significant issues can be seen in **Figure 31** below.

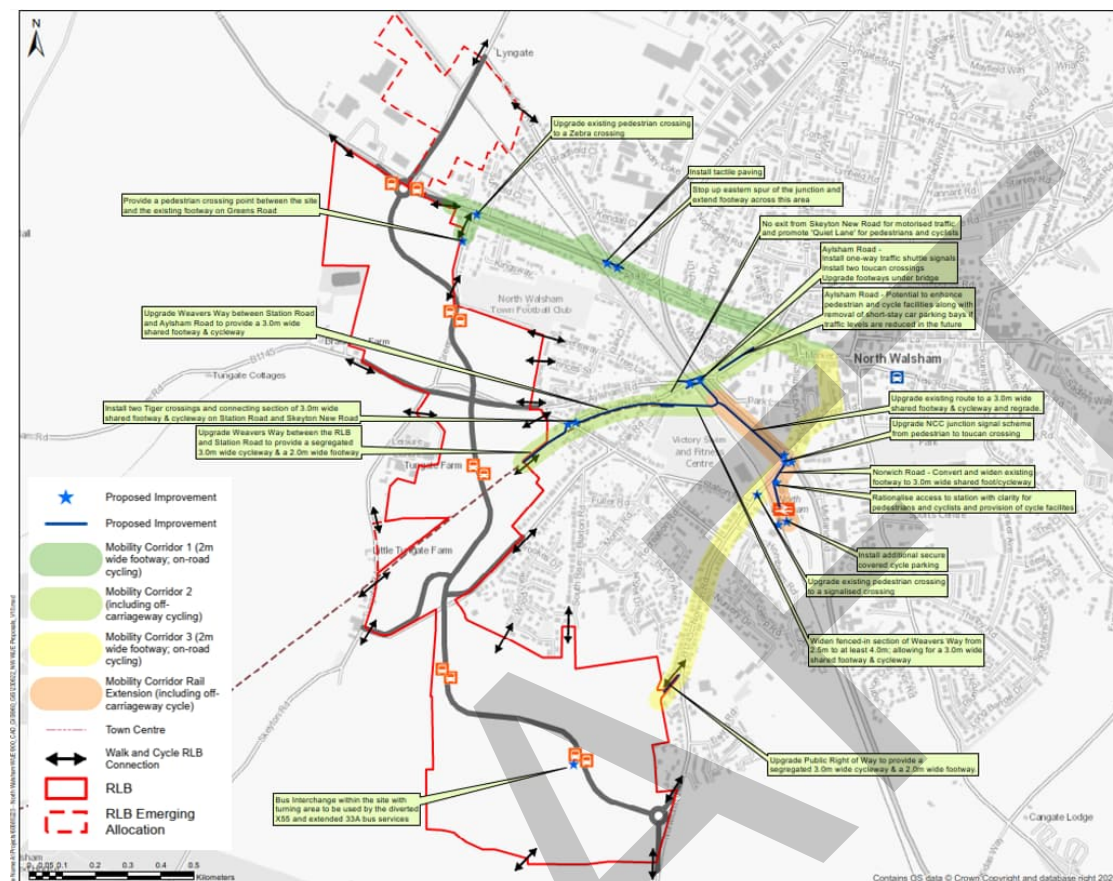
Figure 31 – Opportunities for cyclist improvements



Mobility Corridors

- 5.29 Taking account of existing constraints and opportunities, and the anticipated movements from the proposed development, three routes between the allocation and the town centre have been identified as key routes which are suitable to be promoted for pedestrians and cyclists and suitable for focused pedestrian and cycle infrastructure improvements. These improvements will enable pedestrians and cyclists to travel between the allocation and the amenities safely and effectively in the town centre. The routes proposed for improvements are routes A2 (A149 Cromer Road), A5 (Skeyton Road / Weavers Way), and A8 (B1150 Norwich Road). Each of the routes identified for improvements are designated as 'Mobility Corridors'.
- 5.30 The Mobility Corridors identified and the proposed improvements along them are shown in **Figure 32** below and outlined in the following sections. This figure is also found in **Appendix F**.
- 5.31 The aim of these corridors and the associated improvements identified is to support contiguous and safe pedestrian and cycle facilities to connect the proposed development with key destinations.
- 5.32 There are existing constraints which determine what can be achieved and it is not possible to deliver dedicated cycle facilities on each of the routes. The corridor with the strongest desire line is the central corridor along Weavers Way, Skeyton New Road, and Aylsham Road. This route offers the potential to provide a single, continuous, high-quality, cycle route between the allocation and the town centre/ station suitable for cyclists of all ages, abilities, and confidence levels. More confident cyclists will have the option to use the carriageway along Cromer Road and Norwich Road, where off road facilities do not exist.

Figure 32 – Mobility Corridors



Mobility Corridor 1 Recommendations (Route A2)

1. Install a pedestrian crossing facility between the allocation land and the existing footway on Greens Road.
2. Upgrade the pedestrian crossing on A149 Cromer Road to a zebra crossing.
3. Install tactile paving to the crossing at the A149 Cromer Road / Bradfield Road priority junction.
4. Stop up the eastern spur of the A149 Cromer Road / Bradfield Road priority junction and widen the footway to 2.0m.

Mobility Corridor 2 Recommendations (Route A5)

5. Upgrade Weavers Way between the allocation and Station Road in line with LTN 1/20, with a segregated 3.0m wide cycleway and 2.0m footway. This should include lighting where sections are currently unlit.
6. Divert Weavers Way through the car park at Station Road and install a crossing facility on Station Road.
7. Upgrade Weavers Way between Station Road and Aylsham Road in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility. This should include lighting where sections are currently unlit. This includes the widening of the 50m length of the fenced-in section of Weavers Way next to 40 Oak Road from 2.5m to at least 4.0m to allow for a 3.0m wide pedestrian and cycle facility to be installed.
8. Provide a shuttle operation traffic signal control system under the Aylsham Road railway bridge to allow for the provision of a footways on the southern side of Aylsham Rd and widening of the existing footway on the Northern side. Crossing facilities should be included within the signals scheme to assist pedestrians and cyclists.
9. Provide a new crossing facility on Park Lane to assist pedestrians to cross at the point where footway stops.

Mobility Corridor 3 Recommendations (Route A8)

- 10. Upgrade PRow within the allocation to Norwich Road in line with LTN 1/20, with a segregated 3.0m wide cycleway and 2.0m footway. This will be surfaced with asphalt and lighting will be added where sections are currently unlit.
- 11. Upgrade the existing pedestrian crossing on Norwich Road, immediately west of the railway bridge to a signal-controlled crossing to improve access to North Walsham Station.

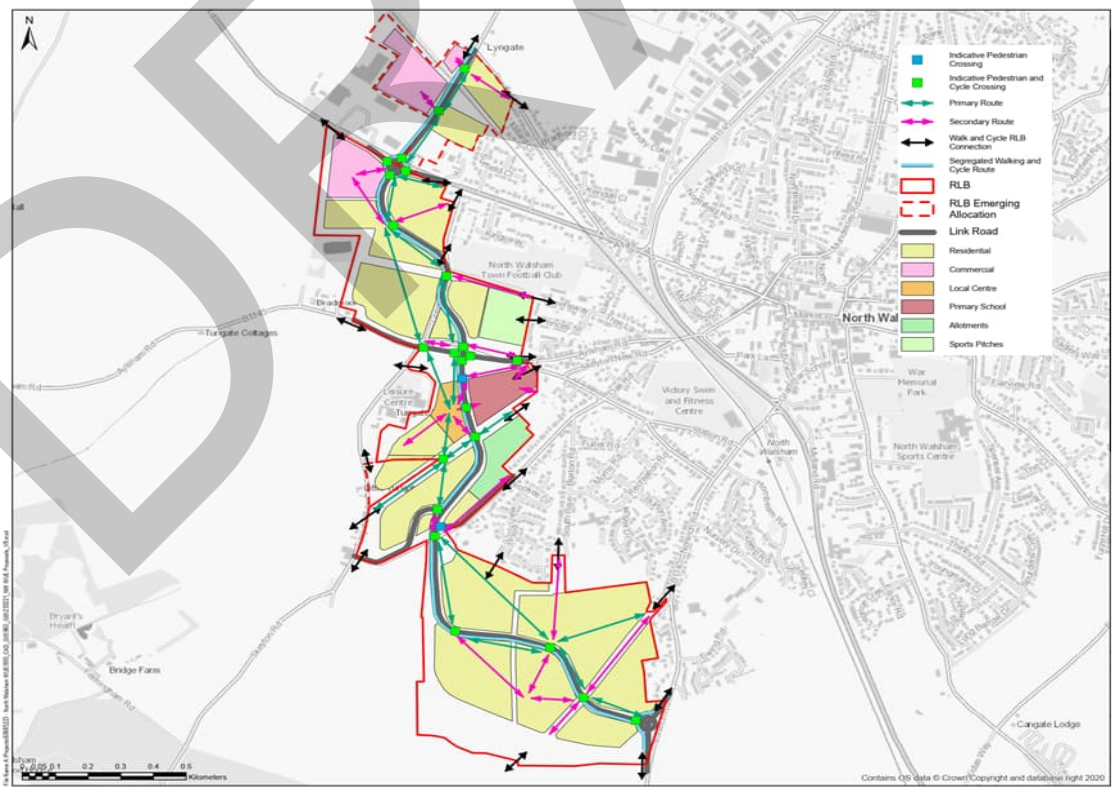
Mobility Corridor Rail Extension Recommendations (Part of Route B1)

- 12. Upgrade the existing shared pedestrian and cycle route between Aylsham Road and Norwich Road along the A149 North Walsham Bypass in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility. This should be surfaced with asphalt.
- 13. Install a north-south pedestrian and cycle signalised crossing at the B1150 Norwich Road / A149 signalised junction to support improved access to the Town Centre and station.
- 14. Widen and convert the footway along the eastern side of Norwich Road between the A149 and the station entrance to a 3.0m wide shared pedestrian and cycle surface to allow for the access to the station to be rationalised.

On-Site Walking and Cycling Strategy

- 5.33 The key pedestrian and cycling route, as identified by the desire lines, will be provided along the link road. This will facilitate movement around the allocation, particularly to the local centre and school. In addition to the main route along the link road, further primary and secondary routes have been identified to provide connections and ensure that active travel is the primary mode of transport.
- 5.34 The indicative link road segregated route, primary and secondary routes, and crossing points can be seen in **Figure 33** below.

Figure 33 – On-Site Walking and Cycling Strategy



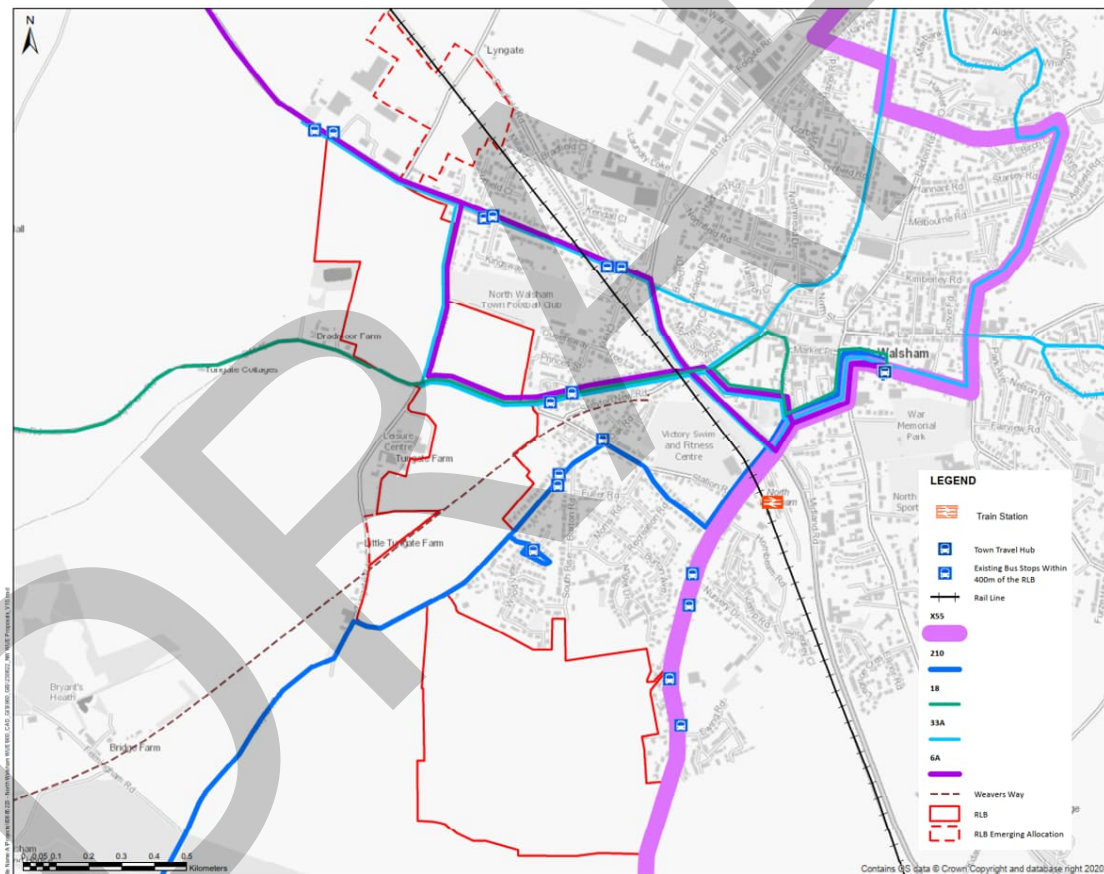
- 5.35 The main route along the link road will provide 3m cycleways and 2m footways along its length. This route will be provided to a high quality to encourage travel along its length and further afield to increase the number of trips by active travel modes and therefore reducing the reliance on the private car.

- 5.36 Primary and secondary routes will be provided within the land parcels connecting to the main route along the link road to ensure that a high level of connectivity is provided within the site and that distances for those walking and cycling is less than for those travelling by car.
- 5.37 Weavers Way, which bisects the allocation, will be a primary route and be upgraded in line with the requirements of LTN1/20, with a 3m cycleway and 2m footway provided where possible, and a minimum of 3m shared surface where this is not. The link road crosses Weavers Way, and a Tiger crossing will be provided to assist users, with gateways to slow cyclists on the approach to the link road to improve safety. **Figure 23** illustrates a cross section of the link road with the pedestrian and cyclist facilities.

Public Transport Strategy

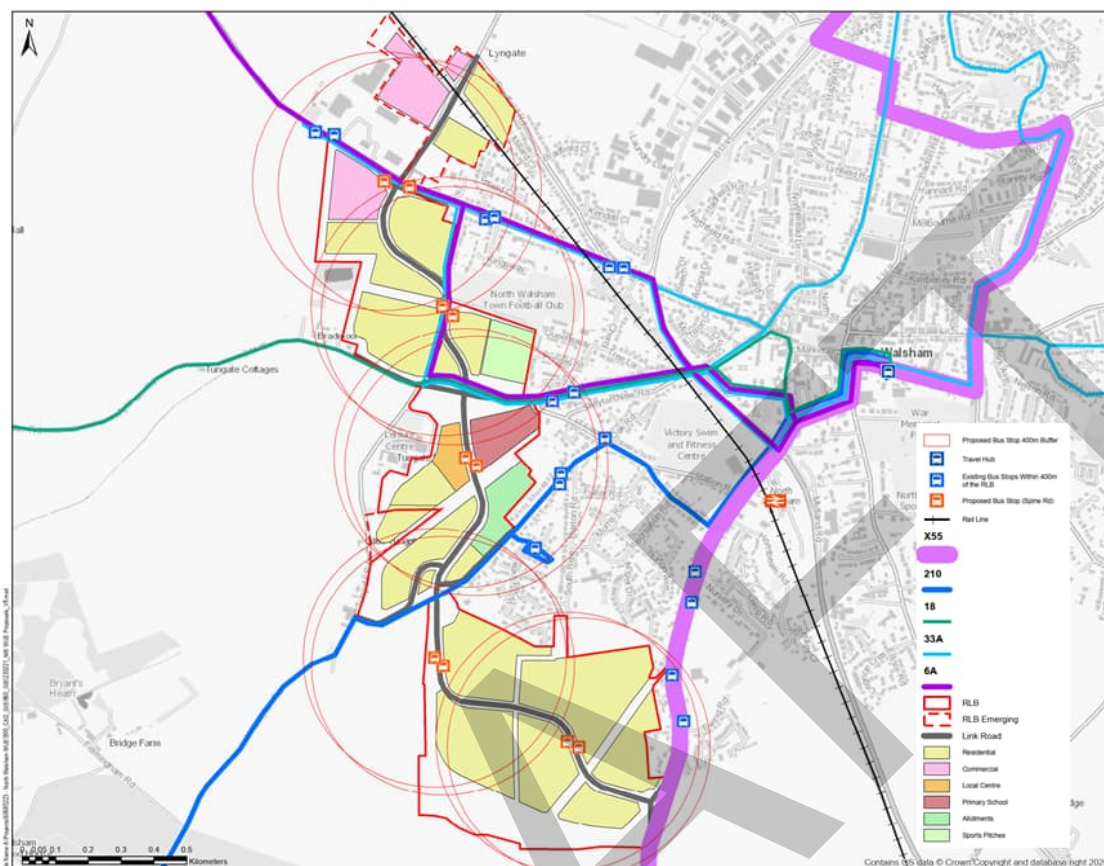
- 5.38 **Figure 34** illustrates the existing bus stops, routes of those services with a regular service of at least every three hours, and the location of the existing travel hub and train station within North Walsham. Also illustrated at the existing bus stops is the indicative 400m radius which suggests that a large proportion of the allocation is already within the recommended distance of a bus stop. It should be noted that more frequent and well-serviced bus routes have a thicker route line.

Figure 34 – Existing Public Transport Network



- 5.39 To enable the entire allocation to be within the recommended walking distance of 400 metres of a bus stop, new bus stops would be required. These would be provided along the link road, with stops provided at key locations such as the local centre, the employment area, and a bus interchange at the southern section of the allocation. The proposed new bus stops and the indicative 400 metres radius they would serve are shown in **Figure 35** below.

Figure 35 – Proposed Bus Stops and 400m Catchment Area



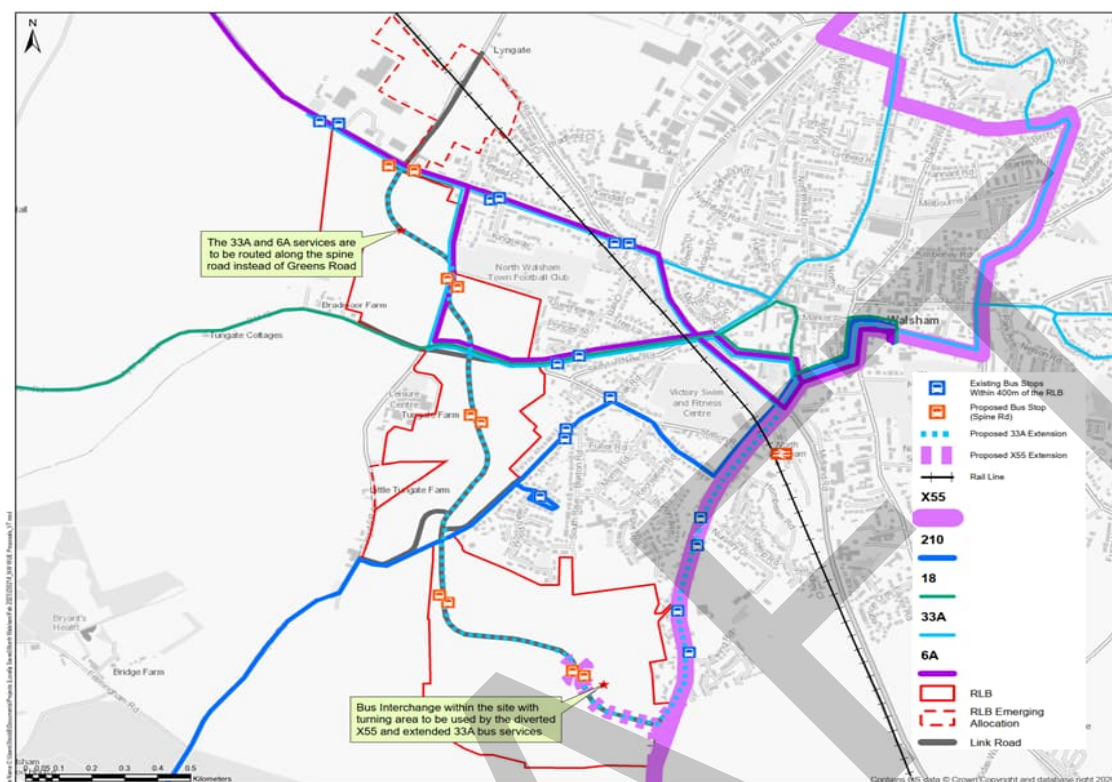
5.40 The following services are proposed to be rerouted/improved to service the new bus stops:

1. A bus interchange, which will allow a turning area for the diversion of the X55 service, as well as the extended 33A service.
2. The 33A and 6A services could be rerouted along the spine road rather than Greens Road.

5.41 The proposed bus stops and changes to bus services can be seen in **Figure 36** below.

5.42 Opportunities to increase service provision outside of peak times should be investigated through the TP for the proposed allocation.

Figure 36 – Proposed Bus Stops and Routes



- 5.43 Although there are no proposed improvements to train-based transport from North Walsham train station, a review is being undertaken to improve access between the Council owned car park and the Cromer bound platform to reduce the number of pedestrian movements needing to be made along the B1150. Greater Anglia have been contacted regarding what options, they, and Network Rail, have considered to improve connectivity between the platforms and to reduce the reliance on the footway under the railway bridge.
- 5.44 The use of the train as a sustainable mode of transport will, however, be promoted through the off-site walking and cycling strategy outlined above, with improvements to access to the route, crossings, and increased cycle parking.

Summary

- 5.45 As part of the Sustainable Transport Strategy, the internal and external desire lines were investigated. The internal desire lines included those between the proposed residential plots and the commercial areas and between the residential plots and the local neighbourhood centre and school. External attractions included the North Walsham town centre and North Walsham railway station. Based on these, one internal and three external corridors were defined. The main desire line within the site was found to generally follow the alignment of the link road, whilst the three external corridors follow the A149 Cromer Road, Skeyton Rd/ Weavers Way, and B1150 Norwich Road, respectively.
- 5.46 Additionally, the existing pedestrian routes to the town centre, train station, and high school were assessed, along with any opportunities for their improvement, based on whether they exhibit *no, moderate, or significant issues*. Similar analysis was conducted for the existing cycling routes, as well.
- 5.47 Moreover, three routes between the allocation and the town centre were recognised as key routes suitable for focused pedestrian and cycle infrastructure improvements and designated as “Mobility Corridors”. Namely, these are A2 (A149 Cromer Road), A5 (Skeyton Rd/ Weavers Way), and A8 (B1150 Norwich Road). Specific improvements were identified for each corridor.
- 5.48 Finally, the existing nearby bus stops and any routes that serve those bus stops at least every three hours were also summarised. Proposals were set out regarding new bus stops within the allocation site, focusing along the link road at key locations, such as the local centre, the employment area, and a bus interchange at the southern part of the allocation. Recommendations for changes to existing bus services were also presented.

- 5.49 The proposed strategy has identified measures to remove barriers to sustainable travel to local services by active modes and has identified a public transport strategy to integrate the proposed allocation site with the well-established public transport network in North Walsham.

DRAFT

6. Highway Access Strategy

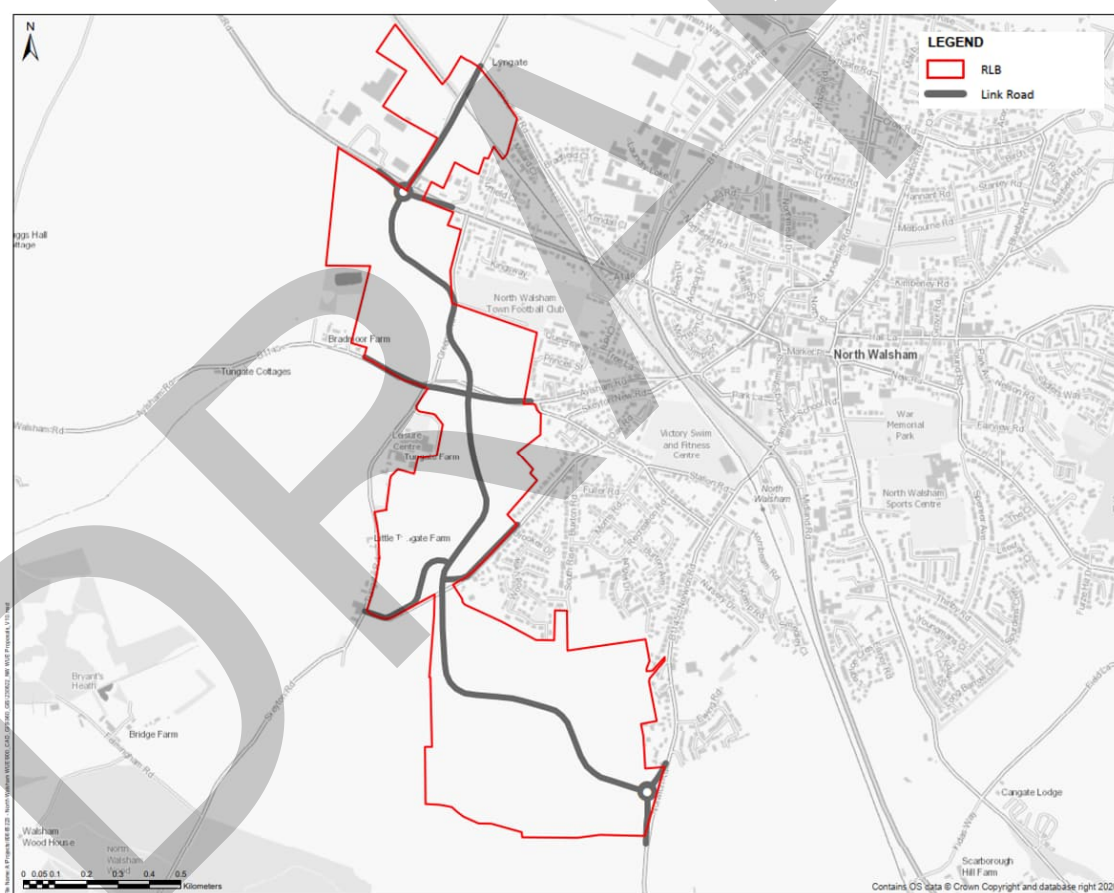
Introduction

- 6.1 This chapter sets out the highway access strategy for the allocation.

Highway Access Strategy

- 6.2 The link road, which will run through the centre of the site in a north-south direction, will be a single carriageway route subject to a 30mph speed limit. It will connect to Bradfield Road in the northern section of the allocation, running to A149 Cromer Road, B1145 Aylsham Road, Skeyton Road, and B1150 Norwich Road. The link road is being designed to accord with the requirements of DMRB and will be able to accommodate HGV traffic which currently utilise Millfield Road and Greens Road. It is anticipated that all allocation parcels will be accessed from the link road.
- 6.3 The site will be accessed from several points on the existing highway network. The indicative access points to the allocation are shown in **Figure 37** below.

Figure 37 – Indicative Link Road and Junctions



- 6.4 An offline four-arm roundabout will be provided at the northern end of the link road connecting with A149 Cromer Road and Bradfield Road. The junctions will be provided with sufficient capacity to accommodate the future predicted traffic levels and to accord with the requirements of DMRB.
- 6.5 A four-arm staggered signalised junction will be provided at the point where a realigned B1145 Aylsham Road connects with the link road. Through traffic along Aylsham Road will be maintained and Greens Road at this point will be stopped up.
- 6.6 An offline three-arm roundabout will be provided at the southern end of the link road connecting with the B1150 Norwich Road. As per the roundabout at the northern end of the link road, the junction will be provided with sufficient capacity to accommodate the future predicted traffic levels and to accord with the requirements of DMRB.

- 6.7 Skeyton Road will be bisected by the link road and given the nature of Skeyton Rd and the low level of traffic it attracts it is proposed that the route is closed to vehicular through traffic. A through route for pedestrians and cyclists would be retained. Vehicular traffic wanting to travel between Tungate Road and Skeyton Road would need to use Aylsham Road.
- 6.8 The section of the B1145 Greens Road south of the existing residential boundary to North Walsham is proposed to be stopped up with a new access to the football club provided from the link road. This is because the proposed link road will deliver a more suitable route in parallel for through traffic.

Northern Extension to Western Link Road

- 6.9 The policy wording for the proposed allocation includes reference to the provision of a northern extension to the Western Link Road from the allocation land, along Bradfield Road to the industrial estate located on Folgate Road. This is commonly known as the Northern Extension to the Western Link Road for North Walsham. This is a proposal which forms part of the Norfolk Strategic Infrastructure Delivery Plan 2022 and the reasoning behind delivery of this Northern Extension is to mitigate existing routing problems for HGVs in North Walsham by providing a suitable route for HGVs over the railway line, and to increase accessibility by sustainable modes and active travel in North Walsham. The Bradfield Road railway bridge has been identified through previous studies to be a significant physical constraint. The engineering requirements and cost implications of delivering the Northern Extension are significant and require further investigation. Delivery of the Northern Link would also require third party unallocated land which sits outside of the control of the proposed allocation boundary. Certainty regarding deliverability of this link is required before funding can be secured.
- 6.10 Due to the uncertainty regarding the proposed link, and the fact that it is not within the control of the proposed allocation landowners to deliver, the Northern Link does not currently form part of the proposals and this assessment has been completed assessing the development impacts in the absence of a Northern Link. Transport justification for this position is set out in the AECOM Technical Note 'Assessment of need for Northern Extension of Western Link Road to support the Western Urban Extension of North Walsham'.
- 6.11 Based on the analysis undertaken, it is considered that:
- Very low levels of development and background traffic would utilise the Northern Link as the route through to Folgate Road would not present a more direct route than Cromer Road offers for most traffic.
 - The proposed development will lead to minimal increase in HGV traffic given the low level of employment use on site and the fact that it is predominantly residential in nature.
 - Whilst the new link would provide an alternative route for high sided vehicles travelling between the west and east of North Walsham, allowing use of the existing railway bridges to be revisited, the volume of high sided vehicles and HGVs for which this would represent a more direct route is relatively low.
 - Given the relatively low volumes the route would attract, the delivery costs of the current preferred route are difficult to justify, and further investigation is needed before a deliverable route which could secure funding can be identified.
 - A new connection linking the B1150 to the industrial estate and the B1145 could attract more HGV movements through Coltishall as the B1150 could become a more attractive route for journeys to and from A1270 Broadland Northway and Norwich. This could therefore have a negative impact on existing issues in Coltishall and would require further consideration.
 - Whilst the land required to provide the complete the Northern Link is not within the allocation boundary or the control of the consortium of landowners, it is possible for the allocation to deliver the main component of the Western Link Road, and to future proof the northern section of the allocation land to allow for future provision of the upgraded route should it come forward in the future.

7. Trip Generation and Distribution

Introduction

7.1 This chapter sets out the methodology applied in respect of calculating trip generation and distribution for the allocation. For information, the figures in the below tables may contain rounding errors.

Trip Generation

7.2 A first principles approach to trip generation has been used to derive bespoke multi-modal trips for the allocation. This has included the use of the:

- Trip Rate Information Computer System (TRICS) to derive person trip rates.
- Local 2011 Census mode share data to derive the modal split.
- National Travel Survey (NTS) to derive journey purpose as it is recognised that not all trips in the peaks are made by those travelling to work.

7.3 In TRICS, the multi-modal person trip rates have been filtered using sites in England (excluding Greater London). Similarly located and sized sites have been chosen. Sites with a population of over 250,000 people within five miles have been excluded. The indicative person trip rates as derived from TRICS are set out in **Table 19** below. It should be noted for the residential trip rates only sites located within Norfolk were chosen.

Table 19 – Indicative Person Trip Generation

Element	Trip Rate Used	Site Selection	Sites Available	Calculation Factor	08:00-09:00		16:30-17:30		Daily	
					Arr	Dep	Arr	Dep	Arr	Dep
Residential	RESIDENTIAL / HOUSES PRIVATELY OWNED	1000-2200 dwells	2	per dwelling	0.225	0.627	0.43	0.238	3.003	3.001
Commercial E(g)(i) use	EMPLOYMENT / OFFICE	Sites with GFA of up to 4,500m ²	3	100 sqm	3.511	0.18	0.221	1.951	12.557	12.689
Commercial E(g)(iii) & B2 uses	EMPLOYMENT / INDUSTRIAL ESTATE	Sites with GFA of 5,000-20,000m ²	2	100 sqm	0.892	0.351	0.42	0.751	6.439	6.685
Commercial B8 use	EMPLOYMENT / WAREHOUSING	Sites with GFA of 1,000-10,000m ²	1	100 sqm	0.564	0.061	0.015	0.473	2.592	2.621

7.4 It should be noted for the purposes of this TA, 2,000 dwellings have been assessed, an increase of 200 over that set out in the policy wording. This has been carried out to ensure a robust assessment of residential trips.

7.5 To establish the proportion of person trips by each mode, reference was made to the Census 2011 data for the Middle Super Output Area (MSOA) North Norfolk 010, which covers North Walsham. The only change made to this mode share is the removal of trips made by underground, metro, light rail, and tram, as there is no infrastructure in North Walsham to facilitate this mode; this mode share has been added to the train mode share. The mode share identified from the Census is shown in

7.6

7.7

7.8 Table 20 below and has been applied to all land uses except residential.

Table 20 – Mode Share for Those Living in North Norfolk 010 MSOA (2011 Census Journey to Work)

Mode	Mode Share
Work mainly at or from home	4%
Underground, metro, light rail, tram	0%
Train	2%
Bus, minibus, coach	2%
Taxi	1%
Motorcycle, scooter, moped	1%
Driving a car or van	65%
Passenger in a car or van	5%
Bicycle	4%
On foot	15%
Other method of travel to work	1%
Total	100%

- 7.9 To account for some modal shift, a mode shift of ten percentage points has been removed from the 'driving a car or van' mode and distributed proportionally across the other modes for the residential aspect of the trip generation only. This would normally be applied to all land uses, however, for robustness, it has only been applied to residential uses. The revised mode share for the residential element of the allocation is shown in **Table 21** below.

Table 21 – Revised Mode Share After Mode Shift

Mode	Mode Share
Work mainly at or from home	5%
Underground, metro, light rail, tram	0%
Train	3%
Bus, minibus, coach	2%
Taxi	1%
Motorcycle, scooter, moped	1%
Driving a car or van	55%
Passenger in a car or van	7%
Bicycle	5%
On foot	19%
Other method of travel to work	1%
Total	100%

Residential Trip Generation

- 7.10 As it is recognised that not all journeys are work related, reference has been made to the DfT NTS which, within Table NTS0502, identifies the percentage of trips by journey purpose for each peak hour, i.e., those travelling to work, taking children to school, and visiting leisure and retail amenities.
- 7.11 Journey purpose proportions for 2015-2019 (to represent pre-Covid levels) have been identified for the AM and PM peak hours and are summarised in **Table 22**. It is assumed that the 'education' journey purpose refers to pupils only and 'education escort' refers to parents escorting their children only. Arrival and

departure percentages are not included in NTS0502, so it has been assumed that there is the same percentage of arrivals and departures.

Table 22 – Journey Purpose Percentages – Based on NTS0502

Journey Purpose	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Commuting	20%	20%	32%	32%	18%	18%
Business	3%	3%	3%	3%	4%	4%
Education	29%	29%	3%	3%	9%	9%
Education Escort	23%	23%	2%	2%	8%	8%
Shopping	4%	4%	12%	12%	17%	17%
Other Work / Other Escort / Personal Business	14%	14%	20%	20%	19%	19%
Visiting Friends / Entertainment / Sport	3%	3%	20%	20%	18%	18%
Holiday / Day Trip / Other	4%	4%	8%	8%	9%	9%
Total	100%	100%	100%	100%	100%	100%

- 7.12 Education trips have been split between trips to pre-school, primary school, secondary school and sixth form. Based on child yield figures from NCC's 'NCC Planning Obligations Standards February 2022' for pre-school (0.10 pupils per dwelling), primary school (0.28 pupils per dwelling), secondary school (0.15 pupils per dwelling), and sixth form (0.02 pupils per dwelling), the person trips have been split 18% to pre-school, 52% to primary school, 27% to secondary school and 3% to sixth form across the day.
- 7.13 Similarly, education escort trips have been split between trips to pre-school, primary school, secondary school, and sixth form and have been based on the proportions for child yield figures mentioned above. Nevertheless, these proportions have been adjusted to reduce the secondary school and sixth form proportions by 30% and assigned to pre-school and primary. This is to account for the fact that parents are more likely to accompany pre- and primary-school-age children to school. The trips are therefore split 20% to pre-school, 59% to primary school, 19% to secondary school and 2% to sixth form.
- 7.14 It should be noted that the TRICS residential person trip rates in **Table 19** include for trips associated with a primary school. TRICS surveys look at external trips going in and out of a development and the underlying TRICS dataset used include a primary school on all sites. It is assumed that for the sites used within the underlying TRICS datasets, the trips relating to the primary school were picked up as part of the TRICS surveys.
- 7.15 As a primary school is proposed as part of the allocation, it has been assumed that all education and education escort trips to the primary school are internal to the allocation. The trips to pre-school, secondary school, and sixth form are all assumed to be external to the allocation.
- 7.16 The journey purpose percentages shown in **Table 22** have been amended to remove the percentages associated with the Primary School from within the Education and Education Escort trips. An updated journey purpose table is shown in **Table 23** below.

Table 23 – Amended Journey Purpose Percentages

Journey Purpose	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Commuting / Business	32%	32%	37%	37%	24%	24%
Education (excluding Primary School)	19%	19%	1%	1%	5%	5%
Education Escort (excluding Primary School)	13%	13%	1%	1%	3%	3%
Shopping	6%	6%	12%	12%	18%	18%
Other Work / Other Escort / Personal Business	20%	20%	21%	21%	21%	21%
Visiting Friends / Entertainment / Sport / Holiday / Day Trip / Other	10%	10%	28%	28%	29%	29%

Journey Purpose	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Total (excluding Primary School)	100%	100%	100%	100%	100%	100%

7.17 The percentages in **Table 23** were applied to the residential person trip generation in **Table 19** to calculate the residential person trip generation by journey purpose for trips external to the site.

7.18 The resultant residential person trips by journey purpose are shown in **Table 24** below.

Table 24 – Residential Person Trips by Journey Purpose (internal and external)

Journey Purpose	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Commuting / Business	144	400	315	174	1427	1426
Education (<i>all</i>)	179	500	26	15	594	593
Education Escort (<i>all</i>)	144	400	19	11	499	498
Shopping	26	74	107	59	1108	1107
Other Work, Other Escort, Personal Business	89	249	177	98	1236	1236
Other	46	128	241	134	1746	1744
Total	628	1751	885	490	6610	6605

7.19 **Table 25** summarises the internal and external education and education escort residential trips separately.

Table 25 – Education and Education Escort Residential Person Trips (internal and external separated)

Journey Purpose	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Education (<i>internal</i>)	94	261	14	8	310	310
Education (<i>external</i>)	86	239	13	7	284	283
Total Education	179	500	26	15	594	593
Education Escort (<i>internal</i>)	85	235	11	6	294	293
Education Escort (<i>external</i>)	59	165	8	4	205	205
Total Education Escort	144	400	19	11	499	498

7.20 **Table 24** and **Table 25** above illustrate the estimated number of person trips generated by journey purpose for the whole allocation (and a further 200 dwellings). The modal share split for each journey purpose is outlined in the following sections.

Commuting / Business

- 7.21 Applying the total residential person trips assigned to commuting / business in **Table 24** to the mode share in **Table 21** provides the multi-modal trip generation projected for this element of the allocation and is shown in **Table 26** below.

Table 26 – Residential – Commuting / Business Multi-Modal Total Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	5	13	10	5	45	45
Bus, minibus, coach	3	9	7	4	31	31
Taxi	1	3	2	1	10	10
Motorcycle, scooter, moped	2	5	4	2	19	19
Driving a car or van	79	220	173	96	785	785
Passenger in a car or van	9	26	21	11	94	93
Bicycle	7	21	16	9	74	74
On foot	28	78	61	34	277	277
Other method of travel to work	2	4	3	2	16	16
Homeworking	8	22	17	9	77	77
Total	144	400	315	174	1427	1426

Education

- 7.22 As mentioned, education trips were split between trips to pre-school, primary school, secondary school and sixth form, based on child yield figures from NCC's '*NCC Planning Obligations Standards February 2022*'. The external trips were split to 38% pre-school, 56% secondary school, and 6% sixth form, while the internal trips were based on those in **Table 25**.
- 7.23 **Table 27** sets out the number of residential person trips attributed to pre-school, primary school, secondary school and sixth form.

Table 27 – Residential – Education Person Trips by School Level

School Level	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Pre-School	32	90	5	3	107	107
Primary School	94	261	14	8	310	310
Secondary School	48	135	7	4	160	160
Sixth Form	5	14	1	0	17	17
Total	179	500	26	15	594	593

- 7.24 Mode share for the education trips has been based on the 2011 Census Journey to Work (JTW), with the mode share from driving a car or van, and motorcycle/scooter/moped being assigned to passenger in a car or van instead. Additionally, the number of responses from people who work mainly at or from home was removed and the respective mode shares were re-calculated. The resulting mode share after these changes can be seen in **Table 28** below.

Table 28 – Residential – Education Mode Share

Mode	Mode Share
Underground, metro, light rail, tram	0%
Train	3%
Bus, minibus, coach	2%
Taxi	1%
Motorcycle, scooter, moped	0%
Driving a car or van	0%
Passenger in a car or van	74%
Bicycle	4%
On foot	16%
Other method of travel to work	1%
Total	100%

- 7.25 Applying the mode share in **Table 28** above to the education journey purpose person trips in **Table 27** provides the total multi-modal trip generation for the education journey purpose in **Table 29** below.

Table 29 – Residential – Education Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	5	13	1	0	15	15
Bus, minibus, coach	3	9	0	0	10	10
Taxi	1	3	0	0	3	3
Motorcycle, scooter, moped	2	5	0	0	6	6
Driving a car or van	0	0	0	0	0	0
Passenger in a car or van	131	366	19	11	434	434
Bicycle	8	21	1	1	25	25
On foot	28	79	4	2	94	94
Other method of travel to work	2	4	0	0	5	5
Total	179	500	26	15	594	593

Education Escort

- 7.26 As mentioned, education escort trips have been split between trips to pre-school, primary school, secondary school, and sixth form and have been based on the proportions for child yield figures previously identified. Additionally, these proportions were adjusted to reduce the secondary school and sixth form proportions by 30% and assigned to pre-school and primary. The external trips were, therefore split, 49% to pre-school, 46% to primary school, and 5% to sixth form, while the internal trips were based on those in **Table 25**.
- 7.27 **Table 30** shows the number of residential person trips attributed to pre-school escort, primary school escort, secondary school escort and sixth form escort.

Table 30 – Residential – Education Escort Person Trips

School Level	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Pre-School	29	81	4	2	101	101
Primary School	85	235	11	6	294	293
Secondary School	27	75	4	2	94	94
Sixth Form	3	8	0	0	10	10
Total	144	400	19	11	499	498

7.28 Mode share for the pre-school and primary school escort has been based on the 2011 Census JTW mode share set out in

7.29

7.30

7.31 Table 20, with the only change being the removal of the work mainly at or from home mode share. The resulting mode share can be seen below in **Table 31**. This is also the same mode share used for the shopping and other journey purposes. Mode shares for the secondary school and sixth form have been based on first principles and it is assumed that education escort trips will be split 80:20 for secondary school and 50:50 for sixth form between walking and car driver.

Table 31 – Residential – Education Escort (Pre-School and Primary)

Mode	Mode Share
Underground, metro, light rail, tram	0%
Train	3%
Bus, minibus, coach	2%
Taxi	1%
Motorcycle, scooter, moped	1%
Driving a car or van	68%
Passenger in a car or van	5%
Bicycle	4%
On foot	16%
Other method of travel to work	1%
Total	100%

7.32 Total multi-modal trip generation for the education escort journey purpose in Table 32 below.

Table 32 – Residential – Education Escort Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	3	8	0	0	10	10
Bus, minibus, coach	2	6	0	0	7	7
Taxi	1	2	0	0	2	2
Motorcycle, scooter, moped	1	3	0	0	4	4
Driving a car or van	84	234	11	6	292	291
Passenger in a car or van	6	17	1	0	21	21
Bicycle	5	13	1	0	17	17

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
On foot	41	114	6	3	142	142
Other method of travel to work	1	3	0	0	4	4
Total	144	400	19	11	499	499

Shopping

7.33 **Table 33** shows the number of residential person trips attributed to the shopping journey purpose.

Table 33 – Residential – Shopping Person Trips

	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Person Trips	26	74	107	59	1108	1107

7.34 The mode share for the shopping journey purpose is based on the 2011 Census JTW with the removal of the working at or mainly from home mode, as seen in **Table 31** above.

7.35 Applying the mode share in **Table 31** above to the shopping journey purpose person trips in **Table 33** provides the total multi-modal person trip generation for the shopping journey purpose in **Table 34** below.

Table 34 – Residential – Shopping Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	1	2	3	2	28	28
Bus, minibus, coach	0	1	2	1	19	19
Taxi	0	0	1	0	6	6
Motorcycle, scooter, moped	0	1	1	1	12	12
Driving a car or van	18	50	72	40	752	751
Passenger in a car or van	1	4	6	3	59	59
Bicycle	1	3	5	2	47	47
On foot	4	12	17	9	175	175
Other method of travel to work	0	1	1	1	10	10
Total	26	74	107	59	1108	1107

Other Work, Other Escort, and Personal Business

7.36 **Table 35** shows the number of residential person trips attributed to the other work, other escort, and personal business journey purpose.

Table 35 – Residential – Other Work, Other Escort, and Personal Business Person Trips

	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Person Trips	89	249	177	98	1236	1236

7.37 The mode share for the other work, other escort, and personal business journey purpose is based on the 2011 Census JTW with the removal of the mainly from home mode, as seen in **Table 31** above.

7.38 Applying the mode share in **Table 31** above to the other work, other escort, and personal business journey purpose person trips in **Table 35** provides the total multi-modal person trip generation for the shopping journey purpose in **Table 36** below.

Table 36 – Residential – Other Work, Other Escort, and Personal Business Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	2	6	5	2	32	32
Bus, minibus, coach	2	4	3	2	22	22
Taxi	1	1	1	1	7	7
Motorcycle, scooter, moped	1	3	2	1	13	13
Driving a car or van	61	169	120	66	839	838
Passenger in a car or van	5	13	9	5	66	66
Bicycle	4	11	7	4	52	52
On foot	14	39	28	15	195	195
Other method of travel to work	1	2	2	1	11	11
Total	89	249	177	98	1236	1236

All Other Trips

7.39 **Table 37** shows the number of residential person trips attributed to the 'all other' trips journey purpose.

Table 37 – Residential – All Other Trips Person Trips

	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Person Trips	46	128	241	134	1746	1744

7.40 The mode share for the 'all other' trips journey purpose is based on the 2011 Census JTW with the removal of the working at or mainly from home mode, as seen in **Table 31** above.

7.41 Applying the mode share in **Table 31** above to the 'all other' trips journey purpose person trips in **Table 35** provides the total multi-modal person trip generation for the all other trips journey purpose in **Table 38** below.

Table 38 – Residential – All Other Trips Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	1	3	6	3	45	45
Bus, minibus, coach	1	2	4	2	31	31
Taxi	0	1	1	1	10	10
Motorcycle, scooter, moped	0	1	3	1	19	19
Driving a car or van	31	87	164	91	1184	1184
Passenger in a car or van	2	7	13	7	93	93
Bicycle	2	5	10	6	74	74
On foot	7	20	38	21	275	275
Other method of travel to work	0	1	2	1	16	16
Total	46	128	241	134	1746	1744

Total Residential Trip Generation

- 7.42 The total combined person trip generation for the residential element of the allocation is shown in **Table 39** below. It should be noted that the trips derived for the residential element of the allocation are based on 2,000 dwellings and not 1,800 as per the policy. This ensures a robust assessment of residential related trips.

Table 39 – Total Residential Trip Generation by Mode

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	16	45	24	13	175	174
Bus, minibus, coach	11	31	17	9	120	120
Taxi	4	10	5	3	39	39
Motorcycle, scooter, moped	7	19	10	6	73	73
Driving a car or van	273	760	541	299	3852	3849
Passenger in a car or van	155	433	69	38	767	766
Bicycle	27	74	40	22	289	289
On foot	123	342	154	85	1158	1157
Other method of travel to work	6	16	9	5	61	61
Homeworking	8	22	17	9	77	77
Total	628	1751	885	490	6610	6605

Employment Trip Generation

- 7.43 Of the proposed 7ha of employment use proposed, the proportional split for the three employment uses is outlined below as:

- Commercial E(g)(i) Office: 10%.
- Commercial E(g)(iii) & B2: 60%; and
- Commercial B8: 30%.

The 7ha was converted to m², which then required conversion to an estimated gross floor area, which was applied to the proportional splits above. The resulting gross developable floor area for each employment use is outlined below.

- Commercial E(g)(i) Office: 2,333m².
- Commercial E(g)(iii) & B2: 14,000m²; and
- Commercial B8: 7,000m².

- 7.44 The TRICS database was utilised to derive person trip rates for the employment element of the allocation as seen in **Table 19**. Applying the trip rates from **Table 19** to the quantum of the allocation above provides the indicative person trips for the allocation, as seen in **Table 40** below.

Table 40 – Employment Person Trips

Person Trips	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
E(g)(i) Office	82	4	5	46	293	296
E(g)(iii) & B2 Industry	125	49	59	105	901	936
B8 Warehousing	39	4	5	23	181	183
Total	246	58	69	174	1376	1415

- 7.45 The 2011 Census JTW mode shares for those who work in the North Norfolk 010 MSOA has been used to derive the mode share for those who will be employed within the allocation. The resulting mode shares can be seen in **Table 41** below.

Table 41 – Mode Share for Those Working in North Norfolk 010 MSOA (2011 Census Journey to Work)

Mode	Mode Share
Underground, metro, light rail, tram	0%
Train	1%
Bus, minibus, coach	1%
Taxi	0%
Motorcycle, scooter, moped	1%
Driving a car or van	68%
Passenger in a car or van	5%
Bicycle	5%
On foot	18%
Other method of travel to work	1%
Total	100%

- 7.46 The mode share identified in **Table 41** has been applied to the person trips for the employment uses in **Table 40**. The resulting multi-modal person trip generation for the employment parcel of the allocation is outlined below in **Table 42**.

Table 42 – Employment Multi-Modal Trips

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	3	1	1	2	17	18
Bus, minibus, coach	3	1	1	2	16	16
Taxi	1	0	0	1	6	6
Motorcycle, scooter, moped	2	1	1	2	13	14
Driving a car or van	166	39	46	118	930	957
Passenger in a car or van	12	3	3	9	70	72
Bicycle	13	3	4	9	75	77
On foot	44	10	12	31	248	255
Other method of travel to work	0	0	0	0	1	1
Total	246	58	69	174	1376	1415

Primary School Trip Generation

- 7.47 The only external trips to the primary school are from staff, of which there have been 42 assumed. The remaining pupil and escort trips have been identified in the residential – education and education escort trip generation.
- 7.48 It also been assumed that there is a temporal split for arrivals and departures, with the peak hours split shown in **Table 43** below.

Table 43 – Teacher Temporal Split at Peak Hours

Time	Arrivals	Departures
08:00-09:00	40%	0%
16:30-17:30	0%	30%

- 7.49 The mode share identified in **Table 41** has been applied to the 42 person trips for the staff working at the primary school. The resulting multi-modal person trip generation for the primary school parcel of the allocation is outlined below in **Table 44**.

Table 44 – Primary School Multi-Modal Trips

Mode	AM Peak (0800-0900)		PM Peak (1630-1730)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	0	0	0	0	1	1
Bus, minibus, coach	0	0	0	0	0	0
Taxi	0	0	0	0	0	0
Motorcycle, scooter, moped	0	0	0	0	0	0
Driving a car or van	11	0	0	9	28	28
Passenger in a car or van	1	0	0	1	2	2
Bicycle	1	0	0	1	2	2
On foot	3	0	0	2	8	8
Other method of travel to work	0	0	0	0	0	0
Total	17	0	0	13	42	42

Total Trip Generation

- 7.50 The trip generation by mode for each journey purpose element of the allocation have been combined to identify the number of trips which would be classified as internal and those which would be external, and therefore, occur on the highway and sustainable transport networks. The total number of trips generated, internal and external, is set out in **Table 45** below.

Table 45 – Total Trip Generation

Mode	AM Peak (0800-0900)		PM Peak (1700-1800)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	18	45	25	15	188	188
Bus, minibus, coach	13	31	17	11	133	134
Taxi	4	10	6	4	44	44
Motorcycle, scooter, moped	9	19	11	7	85	85
Driving a car or van	428	791	577	408	4732	4756
Passenger in a car or van	166	435	71	45	829	830
Bicycle	39	77	43	31	359	361
On foot	162	349	163	113	1386	1392
Other method of travel to work	5	16	8	5	61	61
Homeworking	8	22	17	9	77	77
Total	853	1795	937	647	7893	7928

7.51 The internalisation assumptions which have been applied are set out in **Table 46**.

Table 46 – Internalisation Assumptions

Lane Use	Trip Purpose	Assumption
Residential	Commuting / Business	It has been proposed that 10% of trips originating from the allocation will remain internal to the site.
	Education	It is assumed that education primary school trips will be internal to the site, the remaining education trips are assumed to all be external.
	Education Escort	It is assumed that education escort primary school trips will be internal to the site, the remaining trips are assumed to all be external.
	Shopping	Assumed to all be external.
	Other Work, Other Escort, and Personal Business	Assumed to all be external.
	Other	Assumed to all be external.
Employment		It has been proposed that 10% of trips originating from the allocation will remain internal to the site data from the Census 2011 data.
Ancillary Retail		Assumed to all be internal as all trips will be either pass-by or diverted trips already on the network or by sustainable modes
Primary School		Pupil and parent escort trips assumed to be internal to the site. All staff trips assumed to be external.

Total External / Internal Trip Generation

7.52 Based on the internalisation assumptions set out above, the total multi-modal internal trip generation for the allocation is set out in **Table 47** below.

Table 47 – Total Allocation Multi-Modal Internal Trips

Mode	AM Peak (0800-0900)		PM Peak (1700-1800)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	5	14	2	1	20	20
Bus, minibus, coach	3	10	1	1	14	14
Taxi	1	3	0	0	4	4
Motorcycle, scooter, moped	2	6	1	0	8	8
Driving a car or van	65	182	25	14	278	278
Passenger in a car or van	74	206	13	7	252	252
Bicycle	8	23	3	1	33	33
On foot	31	86	10	6	123	123
Other method of travel to work	2	5	1	0	7	7
Homeworking	1	2	2	1	8	8
Total	193	537	57	31	746	746

7.53 The total multi-modal external trip generation for the allocation is set out in **Table 48** below.

Table 48 – Total Allocation Multi-Modal External Trips

Mode	AM Peak (0800-0900)		PM Peak (1700-1800)		Daily	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Underground, metro, light rail, tram	0	0	0	0	0	0
Train	13	31	23	14	168	168
Bus, minibus, coach	10	22	16	10	120	120
Taxi	3	7	5	3	39	40
Motorcycle, scooter, moped	7	13	10	7	77	77
Driving a car or van	363	609	552	394	4454	4478
Passenger in a car or van	92	229	58	38	577	579
Bicycle	31	54	40	29	326	328
On foot	131	263	152	107	1263	1269
Other method of travel to work	4	11	8	4	54	54
Homeworking	7	19	15	8	69	69
Total	661	1258	881	615	7146	7182

Phasing

7.54 The assessment will assess future-year scenarios for full build out by 2036. The phasing will be examined in more detail at planning application stage where interim years can be fully assessed. The person trip rates identified in **Table 19** have been applied to the full build-out including for up to 2,000 dwellings, 23,333m² employment land, and a primary school.

Trip Distribution

7.55 The NOMIS website, a service provided by the Office of National Statistics (ONS), holds publicly available data from the Census and other up-to-date UK labour market statistics from official sources. This has been interrogated to obtain Journey to Work origin-destination data from the 2011 Census for MSOA North Norfolk 010. This is the MSOA which encompasses all North Walsham, including the allocation. It should be noted that no allowance has been made to routes where greater availability of access to more sustainable modes of transport, i.e., rail and bus for journeys to Norwich which could impact on the level of vehicular trips generated along these routes. The route between Norwich and North Walsham could therefore generate less car trips than has been identified. This is not reflected in the analysis and is therefore considered to be robust.

7.56 The vehicular trips derived for the different land uses have been distributed onto the existing network using a VISSIM model. Vehicular trips have been distributed and assigned onto the highway network as follows:

- The main trip generator destinations of those living in MSOA North Norfolk 010 have been identified. All residential peak hour trips related to the allocation have been distributed in accordance with the existing (2011) distribution of the main trip generator destinations from the MSOA.
- The proposed vehicular traffic to and from the allocation has been distributed at:
 - MSOA level to destinations within North Norfolk District.
 - MSOA level to destinations within Broadland District.
 - District level to destinations within the East of England; and
 - Regional level to all other destinations in England and Wales.
- Vehicular trips have been assigned logically on the key routes on the highway network serving the allocation.

- 7.57 **Table 49** below summarises the vehicular trip distribution, based on entry and exit points of the assessed local highway network.

Table 49 – Vehicular Trip Distribution

Network entry/exit	Distribution
Internal to North Walsham	24%
B1145 Aylsham Road	8%
Cromer Road	14%
B1145 Lyngate Road	2%
Skeyton Road	0%
B1150 Norwich Road	37%
A149	12%
Happisburgh Road	2%
Total	100%

- 7.58 The assumed internal trip distribution within North Walsham is outlined in **Table 50** below.

Table 50 – Internal to North Walsham Vehicular Trip Distribution

Location in North Walsham	Distribution
Bank Loke Car Park	10%
Vicarage Streetcar Park	10%
Train Station	6%
Folgate Road Industrial Estate	20%
Waitrose	10%
Employment North of Waitrose	2%
Sainsbury's	10%
North Walsham Junior School	1%
Travel Hub/Community Centre	7%
Lidl	6%
North Walsham High School	9%
North Walsham Hospital	3%
Hornbeam Road Industrial Estate	4%
Garden Centre	1%
Rossis Leisure	1%
Total	100%

- 7.59 The trip assignment to/from each MSOA has been identified based on the fastest route available using the Google Maps route planning tool on a neutral weekday (Wednesday) at 08:30 hours, which takes account of existing congestion experienced on the network and covers the AM peak hour identified for this assessment. Where there is more than one route option available, a weighting has been applied depending on the likelihood of each route being used based on distance and estimated journey time. The vehicular routes identified have been reversed for departing trips.
- 7.60 All vehicular trips will enter and exit the allocation from either A149 Cromer Road, B1145 Aylsham Road, or B1150 Norwich Road and have been distributed to and from these access points. This is the case for the residential areas and employment areas.
- 7.61 This enables the identification of the proportion of trips that would take a particular route through the study area, for both arriving and departing trips. The proposed trips as identified in the Trip Generation section can then be applied to the study area highway network to understand the vehicular impact of the development on the relevant junctions. Whilst the methodology is deemed appropriate, there are some points worth noting, as set out below:

- Trips have been distributed based on the existing fastest route as illustrated on the Google Maps route planning tool. People may take different routes and may not necessarily use the fastest route.
- No further distribution adjustments have been made for future scenarios because of any potential future changes in the housing or workplace distributions or changes in the performance of the network.
- Allowance has not been given to travel planning and sustainable measures that could be incorporated into the allocation to reduce car-based trips.

DRAFT

8. Highway Network Assessment Scope

Introduction

- 8.1 This chapter sets out the scope of the highway network assessment and the impact of the allocation on the highway network.

Assessment Scenarios

- 8.2 To assess the impact of the allocation on the local road network, three assessment scenarios have been considered. The assessment scenarios are set out in **Table 51** below.

Table 51 – Assessment Scenarios

Assessment	Definition	Year	Day / Time	Assumptions	Allocation Assumption
Base	Existing road network and observed traffic flows from traffic counts undertaken in July and November 2022.	2022	Weekday AM and PM peaks	Existing road network.	No allocation proposals or vehicular trips included.
Do Minimum	Base traffic flows + background traffic growth	2036	Weekday AM and PM peaks	Background traffic growth derived from TEMPro added to the base traffic to derive future year flows. The improvements are the A149 / B1150 signalised junction have been included as a committed scheme.	No allocation proposals or vehicular trips included.
Do Something	Do Minimum traffic flows + allocation vehicular trips	2036	Weekday AM and PM peaks	As Do Minimum	Vehicular trips associated with full allocation. Completion of link road and associated highway improvements.
Do Something with Mitigation	Do Something traffic flows + mitigation proposals	2036	Weekday AM and PM peaks	As Do Something	As Do Something with highway mitigation proposals included.

- 8.3 The current assessment would focus on 2036, which coincides with the end of the Local Plan and in the assessment is when full build out would be expected to occur. At planning stage further phasing will be assessed separately such that trigger points for required infrastructure can be identified.

TEMPro Traffic Growth

- 8.4 Reference has been made to the DfT traffic growth software TEMPro 7.2c to derive baseline and future year traffic flows for 2036. Car driver traffic growth factors for the base year and opening year have been derived using dataset 72 (RTF 2018 Scenario 1), geographical area North Norfolk 010 and adjusted using the National Traffic Model for all road types.
- 8.5 During the undertaking of the assessment, a newer version of TEMPro was released, version 8.0 however, this version of TEMPro did not allow for the calculation of National Traffic Model (NTM) traffic growth figures. Although growth factors could not be derived, a review of the planning data was undertaken. The review confirmed changes to the base and future households and jobs. The changes have occurred as more up to data planning data has been utilised and taken from Local Plans and Planning Authority sources. The changes to base and future households and jobs is set in **Table 52** below.

Table 52 – Planning Data – Planning Changes

TEMPro Version	2022		2036	
	Base Households	Base Jobs	Future Households	Future Jobs
7.2	6628	5555	7801	5792
8.0	6170	5476	6536	5788
Difference	-458	-79	-1265	-96

- 8.6 This illustrates that fewer houses and jobs have, and are expected to, come forward in North Walsham based on the most up to date dataset.
- 8.7 The planning data included in TEMPro version 8 is considered more representative and therefore this has been reflected in version 7.2 in the alternative assumptions before the growth rates have been derived. The data has been reviewed to confirm that the full allocation of the Hopkins Homes development in North Walsham is included and that the full allowance for the permitted development Scottow Enterprise Park has been included also.
- 8.8 The resulting traffic factors are set out in **Table 53** below.

Table 53 – TEMPro Local Growth Figure

Year	AM Peak	PM Peak
2022-2036	1.083796	1.080236

- 8.9 The process undertaken is considered to provide greater certainty on the level of background growth than if the most recent version of TEMPro was applied.
- 8.10 One thing this data does not reflect is anticipated changes to car driver trips over time as people shift to more sustainable travel modes and patterns. The most recent TEMPro Guidance identifies alternative growth rates to allow for this to be assessed. This has not been reflected in the current assessment to present a robust assessment for the purposes of the Local Plan.

Percentage Impact Assessment

- 8.11 Following discussions with NCC, it was considered appropriate to model the highway network using VISSIM, a microsimulation traffic modelling tool, which allows for dynamic redistribution of traffic where route choice exists and can model a large area rather than follow the standard approach whereby each junction is modelled individually and therefore cannot take account of inter junction interaction and impacts elsewhere on the network.
- 8.12 A numerical and percentage change assessment has been carried out for the future year scenarios for both North Walsham and Coltishall using traffic data extracted from the calibrated VISSIM models. These compare the VISSIM model outputs for Do Something (Demand flows) against the Do Minimum traffic flows and illustrate the extent of change in traffic expected across the study area road network.
- 8.13 **Table 54** and **Table 55** below provides a summary of the numerical and percentage change in vehicular trips derived through the Vissim Modelling study network junctions in the peak hours for each of the scenarios assessed in North Walsham and Coltishall.
- 8.14 The full percentage change output tables for North Walsham and Coltishall are included at **Appendix B** whilst the traffic flow diagrams illustrating the flows across the networks in the scenarios assessed are included at **Appendix C**.
- 8.15 This illustrates an increase in traffic volumes on each arm and across each of the key junctions assessed. From this data, in North Walsham, the increase in traffic on junction approaches is generally less than 60 vehicles per hour in all periods, except for B1150 Norwich Road where the residual % impact reaches 20%. This is largely because the proposed link road allows traffic to redistribute more efficiently and caters for the growth in traffic. On Norwich Road capacity improvements at the B1150/ A149 junction which are committed and under design by NCC provide for traffic growth and allow traffic to be attracted to this route.
- 8.16 In the '2036 Do Something with Mitigation' Scenarios, traffic volumes are predicted to reduce on the following routes from future predicted baseline levels, through the closure of through routes and the provision of the new link road, despite the provision of the new development:

- Greens Road;
 - Station Road,
 - Millfield Road,
 - Tungate Road;
 - A149 North Walsham Relief road;
 - Skeyton Road; and
 - Skeyton New Road.
- 8.17 The proposed link road draws between 300 and 343 peak hour trips in the peak hours, which includes local traffic from existing routes. This highlights that the proposed link road is helping to address current traffic routing issues in North Walsham, by attracting local traffic, and connecting the A149 and B1150.
- 8.18 What is noted is that despite the proposed traffic management measures on Skeyton New Road and on Aylsham Road at the railway bridge, there is a residual net increase in the eastbound direction of 37 vehicles in the PM peak hour. Aylsham Road has a short section with no footways where the 20-mph zone commences, and driveways open directly onto a narrow road which is particularly sensitive. Increasing traffic on this route should be avoided if possible and to help further discourage the use of Aylsham Road as a through route into North Walsham for general traffic, it is proposed that the Aylsham Road junction with the proposed new link road is provided as a staggered signalised junction to break the through route along Aylsham Road. This will reduce vehicle speeds on entry to Aylsham Road and make the use of this as a through route more difficult. It is also recommended that at planning stage further traffic management measures are explored to minimise the impact of traffic impacts, such as designating the route for access only, provision of additional signage and provision of horizontal deflection to impose speed reductions for traffic.
- 8.19 Furthermore, the promotion of active modes for local trips will be a priority through the investment in addressing gaps in the pedestrian and cycle network, and through delivering a highly accessible development area. Public transport permeability and enhanced facilities will help drive public transport usage.

Table 54 – North Walsham Percentage Impact Assessment

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh Change	% Change	Veh Change	% Change	Veh Change	% Change	Veh Change	% Change
1	Bradfield Road / Cromer Road / Link Road	Bradfield Road (N)	53	5300%	53	5300%	62	886%	62	886%
		Cromer Road (W)	63	17%	63	17%	110	19%	110	19%
		Proposed Link Road	343	N/A	389	N/A	294	N/A	291	N/A
		Cromer Road (E)	1	0%	-21	-4%	-13	-3%	-10	-2%
		Total	460	52%	484	55%	450	43%	456	43%
2	Cromer Road / Greens Road	Cromer Road (W)	9	2%	36	10%	-1	0%	1	0%
		Greens Road (S)	-139	-100%	-139	-100%	-144	-100%	-144	-100%
		Cromer Road (E)	40	9%	18	4%	6	1%	9	2%
		Total	-90	-9%	-85	-9%	-139	-12%	-134	-11%
3	B1145 / A149 / A149 Cromer Road / Cromer Road	B1145 (N)	32	7%	32	7%	37	7%	37	7%
		Cromer Road (W)	55	17%	95	29%	37	7%	42	7%
		A149 (S)	15	3%	-21	-4%	-11	-2%	-10	-2%
		Cromer Road (E)	0	0%	0	0%	0	0%	0	0%
		Total	102	7%	106	8%	63	4%	69	4%
4	Cromer Road / Mundesley Road / Market Street / Aylsham Road	Mundesley Road (N)	0	0%	0	0%	0	0%	0	0%
		Cromer Road (W)	-3	-4%	15	20%	0	0%	0	0%
		Aylsham Road (S)	19	5%	-2	-1%	15	4%	15	4%
		Market Street (E)	0	0%	0	0%	0	0%	0	0%
		Total	16	3%	13	2%	15	2%	15	2%
5	Aylsham Road / Park Lane	Aylsham Road (E)	0	0%	0	0%	0	0%	0	0%

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh Change	% Change	Veh Change	% Change	Veh Change	% Change	Veh Change	% Change
		Aylsham Road (W)	26	18%	-9	-6%	32	28%	17	15%
		Park Lane (S)	30	7%	35	8%	-13	-3%	-9	-2%
		Total	56	10%	26	5%	19	3%	8	1%
6	Aylsham Road / Skeyton New Road	Aylsham Road (E)	40	24%	30	18%	3	2%	-10	-7%
		Aylsham Road (W)	26	19%	1	1%	36	34%	37	35%
		Skeyton New Road (S)	0	0%	-13	-100%	0	0%	-22	-100%
		Total	66	21%	18	6%	39	15%	5	2%
7	B1145 Aylsham Road / Aylsham Road / Greens Road / Tungate Road	Greens Road (N)	-150	-100%	-150	-100%	-167	-100%	-167	-100%
		Aylsham Road (W)	23	13%	23	13%	45	28%	45	28%
		Tungate Road (S)	-5	-12%	-19	-44%	-7	-15%	-4	-9%
		Aylsham Road (E)	9	3%	12	5%	25	14%	22	12%
		Total	-123	-20%	-134	-22%	-104	-19%	-104	-19%
8	Aylsham Road / Station Road	Aylsham Road (E)	33	29%	22	20%	28	38%	14	19%
		Aylsham Road (W)	-24	-10%	-39	-16%	-37	-17%	-10	-5%
		Station Road (S)	-52	-25%	-29	-14%	-28	-15%	-34	-18%
		Total	-43	-8%	-46	-8%	-37	-8%	-30	-6%
9	Station Road / Skeyton New Road	Skeyton New Road (E)	-1	-2%	12	24%	1	2%	23	46%
		Station Road (N)	-36	-20%	-53	-30%	-53	-31%	-47	-27%
		Station Road (S)	-60	-28%	-58	-27%	-27	-13%	-51	-25%
		Total	-97	-22%	-99	-22%	-79	-19%	-75	-18%

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh Change	% Change	Veh Change	% Change	Veh Change	% Change	Veh Change	% Change
10	Station Road / Oak Road / Skeyton Road	Oak Road (N)	0	0%	0	0%	0	0%	0	0%
		Station Road (W)	-46	-21%	-70	-32%	-53	-24%	-43	-20%
		Skeyton Road (S)	-54	-57%	-63	-67%	53	96%	32	58%
		Station Road (E)	-28	-13%	-17	-8%	-33	-16%	-39	-19%
		Total	-128	-24%	-150	-28%	-33	-7%	-50	-10%
11	Station Road / Millfield Road / Morris Road	Station Road (N)	-25	-12%	-42	-20%	1	1%	9	5%
		Morris Road (W)	11	13%	11	13%	0	0%	0	0%
		Millfield Road (S)	-45	-28%	-21	-13%	-34	-23%	-37	-25%
		Station Road (E)	12	N/A	8	N/A	5	12%	4	9%
		Total	-47	-10%	-44	-10%	-28	-7%	-24	-6%
12	B1150 Norwich Road / Millfield Road	Norwich Road (N)	20	4%	76	17%	106	20%	114	22%
		Millfield Road (W)	-25	-11%	-31	-14%	-1	-1%	7	6%
		Norwich Road (S)	41	9%	37	8%	-96	-17%	-94	-17%
		Total	36	3%	82	7%	9	1%	27	2%
13	B1150 Norwich Road / Station Road	Norwich Road (N)	26	6%	82	17%	108	19%	116	21%
		Station Road (W)	-10	-14%	-6	-8%	-1	-2%	0	0%
		Norwich Road (S)	98	22%	108	24%	-7	-1%	6	1%
		Total	114	11%	184	18%	100	9%	122	11%
14	B1150 Norwich Road / A149 / Norwich Road	Norwich Road (E)	10	2%	22	4%	68	15%	79	17%
		A149 (N)	27	6%	36	8%	29	5%	28	5%
		Norwich Road (W)	73	14%	88	17%	-11	-2%	2	0%

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh Change	% Change	Veh Change	% Change	Veh Change	% Change	Veh Change	% Change
		A149 (S)	48	14%	49	14%	68	17%	68	17%
		Total	158	9%	195	11%	154	8%	177	9%
15	Grammar School Road / King's Arms Street	King's Arms Street (N)	9	10%	10	12%	22	22%	22	22%
		Grammar School Road (W)	55	10%	71	13%	6	1%	20	4%
		Grammar School Road (E)	40	7%	40	7%	63	11%	62	11%
		Total	104	8%	121	10%	91	8%	104	9%
22	B1145 / Laundry Loke	B1145 (S)	34	9%	36	10%	29	7%	29	7%
		Laundry Loke (W)	6	7%	6	7%	22	13%	22	13%
		B1145 (N)	27	7%	27	7%	16	4%	16	4%
		Total	67	8%	69	8%	67	7%	67	7%
16	B1145 / Lyngate Road / Folgate Road	B1145 (N)	14	5%	14	5%	7	4%	7	4%
		Lyngate Road (E)	10	4%	10	4%	4	2%	4	2%
		B1145 (S)	-16.8	5%	-16.8	5%	-16.8	7%	-16.8	7%
		Total	35	4%	35	4%	35	4%	35	4%
		Folgate Road (W)	0	0%	0	0%	-1	-1%	-1	-1%

Table 55 – Coltishall Percentage Impact Assessment

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh change	% change	Veh change	% change	Veh change	% change	Veh change	% change
1	Rectory Road / B1150 Norwich Road / Mill Road	Norwich Road (E)	180	23%	180	23%	67	9%	67	9%
		Millfield Road (S)	1	5%	1	5%	0	0%	0	0%
		Norwich Road (W)	60	9%	60	9%	133	17%	131	17%
		Rectory Road (N)	-1	0%	-1	0%	0	0%	0	0%
		Total	240	14%	240	14%	200	12%	198	11%
2	B1150 Norwich Road / B1354 Church Street / High Street / Petrol Station	High Street (N)	195	34%	197	34%	69	14%	67	14%
		B1354 (E)	-2	-1%	-2	-1%	1	0%	1	0%
		Petrol Station (S)	0	0%	0	0%	0	0%	0	0%
		Norwich Road (W)	55	7%	57	7%	159	20%	158	20%
		Total	248	15%	252	15%	229	14%	226	14%
3	High Street / Station Road	Station Road (N)	190	33%	190	33%	71	16%	71	16%
		High Street (S)	67	15%	68	16%	159	28%	159	28%
		Great Hautbois Road (N)	0	0%	0	0%	0	0%	0	0%
		Total	257	25%	258	25%	230	22%	230	22%
4	Church Loke / B1354 / Rectory Road	Rectory Road (N)	2	4%	2	4%	-2	-4%	-2	-4%
		B1354 (E)	-2	-1%	-2	-1%	17	5%	17	5%
		Church Loke (S)	1	17%	1	17%	1	17%	1	17%
		B1354 (W)	-4	-1%	-2	0%	15	5%	15	5%
		Total	-3	0%	-1	0%	31	5%	31	5%

- 8.20 In Coltishall the volume of through traffic on the B1150 is predicted to increase by on average 250 vehicles (two way) in the peak hours which is significant. The impact of this on capacity is considered separately.
- 8.21 From the accident analysis there were no accident clusters or specific road safety issues identified within Coltishall and Horstead, that this traffic increase would exacerbate, although vehicle speeds on entry from the south into Horstead were slightly above the speed limit.
- 8.22 The issue of pedestrian safety is something which the Parish Council have already brought to the attention of NCC and the increase in traffic arising from the proposed development will make it more difficult for pedestrians to cross the B1150. A separate study is underway by NCC examining pedestrian crossing safety in Coltishall on High Street which will look for potential to deliver formal and improved crossing facilities.
- 8.23 The issue of pedestrians crossing the B1150 in Horstead, near the Recruiting Sergeant, and to the north of Coltishall at Ling Way, have been raised as a concern by the Parish Council and should be examined at planning stage.
- 8.24 It should be noted that the traffic volumes assessed are considered a worst-case scenario and test 10% higher development growth than proposed and assume very low levels of home working. Furthermore, the highest level of public transport service from North Walsham is focussed on the desire line of the B1150 through express bus services and the railway line, which has not been reflected in the traffic forecasting on this route. For these reasons, the level of forecast traffic is estimated to be at least 15% more than will be realised.
- 8.25 Bearing in mind the lack of alternative routes for traffic, measures to mitigate the impacts of this growth in Coltishall have been identified:
- The impact on the B1150 and Coltishall is best addressed firstly through minimising the traffic growth on this route. The use of public transport will be actively promoted at the development through the proposed public transport strategy, incorporating a bus interchange for express services, and improved active travel access to North Walsham Station and target led travel planning.
 - At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant. It has been agreed with NCC, that following the outcome of their safety study the proposed allocation will look to contribute towards measures identified to mitigate impacts.
 - Creating greater awareness of the village entry and reduced speed limit on the approach to Horstead from the South would help reduce vehicle speeds. At planning stage additional signage should be identified.
- 8.26 Background traffic is also predicted to increase substantially by 2036 and any development growth increasing traffic on the B1150 should be looking at how it can assist NCC in mitigating any potential road safety impacts.

9. Highway Network Assessment

Introduction

- 9.1 This section sets out the results of the highway capacity assessment carried out for North Walsham and Coltishall.

Forecast Modelling

- 9.2 The VISSIM models have assessed the 2036 future year scenarios to test the operation of the network without the development, with the development and further mitigation in place.

Proposed Network Changes

- 9.3 There are changes to the highway network which are either already committed, or which have been identified through this assessment of the proposed allocation, which are reflected in the future year VISSIM models.

Committed Improvements

- 9.4 There is a committed junction improvement scheme at the B1150 Norwich Road / A149 signalised junction which is currently being designed by NCC. The improvement scheme at this junction is coming forward because of the planning consents for the Hopkins Homes and Persimmon Homes developments off B1150 Norwich Road and provides additional capacity. The design improvements also include the provision of two additional signalised pedestrian and cycle crossings on the eastern and southern arms of the junction, which are yet unfunded. The design detail for this junction was provided by NCC for inclusion in the VISSIM model and is included in **Appendix F**. It has been assumed that the proposed allocation would provide funding towards the provision of the additional pedestrian and cycle crossings. The provision of the additional pedestrian and cycle crossings will improve access for pedestrians and cyclists at this key focal point however it should be acknowledged that they will impact on highway capacity at the junction.

Mitigation Measures

- 9.5 The proposed development mitigation package is described in further detail in the next Chapter but for the purposes of understanding the highway assessment findings we have also summarised the measures reflected in the future year modelling here:

North Walsham

- Proposed new link road: New road link between B1150 Norwich and A149 Cromer Road including roundabout junctions on either end, a staggered priority junction with Skeyton Road and a signalised junction with Aylsham Road. Road designed to accommodate HGVs and permit through traffic.
- Aylsham Road traffic management Scheme: Proposed signalised shuttle scheme on Aylsham Road at the railway bridge, incorporating toucan crossings on either end. Skeyton New Road is also closed to through traffic eastbound. This is aimed at allowing road space to be redirected to provided footways, and to discourage through traffic from using Aylsham Road.
- Closure of Green Lane as a through route.

- 9.6 The existing route available north of the railway line along Bradfield Road has been included in the model as an available route, reflecting existing capacity/ physical constraints.

Coltishall

- Proposed Right Turn Lane from B1150 north bound into B1354.
- Proposed replacement of car parking with a Bus Cage at the War Memorial on High Street.

- 9.7 **Table 56** below summarises what is included in which scenario for clarity.

Table 56 – Future Year Highway Network Changes in VISSIM Modelling

Measures	2036 Do Minimum	2036 Do Something	2036 Do Minimum
	AM & PM	AM & PM	AM & PM
North Walsham			
Enhanced signalised junction with ped crossings on three arms at B1150/A149 junction	✓	✓	✓
Proposed new Link Rd from A149 to B1150, intersecting with Aylsham Rd and Skeyton Rd.		✓	✓
Aylsham Rd and Skeyton New Road traffic management & ped safety scheme.		✓	✓
Closure of Green Lane as a through route		✓	✓
Coltishall			
Proposed Right Turn Lane from B1150 north bound into B1354		✓	✓
Proposed replacement of car parking with a Bus Cage at the War Memorial on High Street.		✓	✓

9.8 The 2036 future year traffic flows used for this assessment represent a very robust scenario for the following reasons:

- A total of 2,000 dwellings have been assessed rather than the 1,800 identified within the allocation policy, to allow a conservative estimate of development impacts to be tested;
- No allowance for mode shift in background traffic has been made, despite transport policy being focussed on supporting more sustainable travel patterns and modes;
- Future mode shares at the residential development have been assumed to reflect a reduction of car driver trips by ten percentage points from Census 2011 levels in North Walsham. Bearing in mind the improved level of local public transport provision since 2011 and increased reliance on home working, this is a conservative design case;
- No mode shift has been assumed for employment uses, and local internalisation is assumed to be minimal; and
- The most dominant route for highway traffic from the proposed development has been identified to be along the B1150 towards Norwich. This route also accommodates the most significant public transport services, and the likely higher taken up of public transport along this desire line has not been reflected in the analysis.

9.9 Taking all these factors into account, the forecast traffic flows are considered to have a safety factor of 15% incorporated (i.e., they are 15% higher than they should be in reality). The reason for this is that it is early in the process, and for Local Plan allocation a high-level understanding of the issues to be addressed needs to be fully understood to prove deliverability.

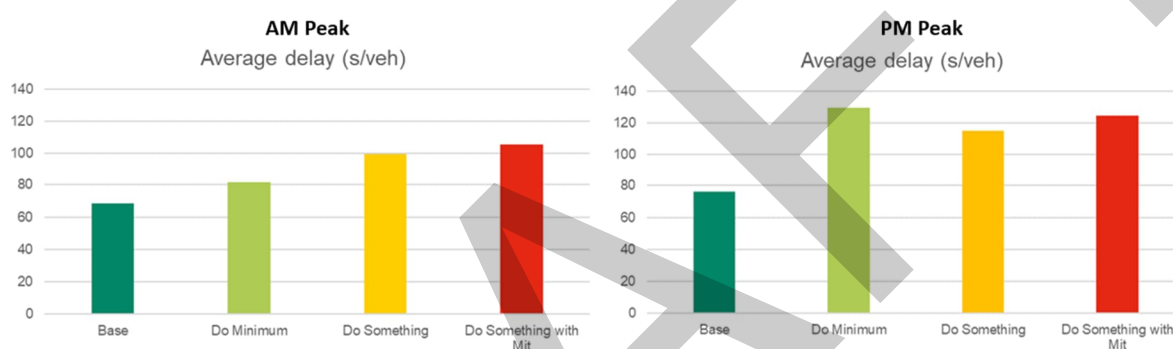
9.10 The results of the VISSIM modelling are summarised in the following sections, with the full results set out in the Forecast Reports included at **Appendix E**.

Overview of Results – North Walsham

Network Delay

- 9.11 To establish the impact of the allocation on the road network within North Walsham, the VISSIM model has been run for the 2036 Do Minimum and Do Something Development scenarios. This allows a comparison to be undertaken between how the road network would operate in 2036 without and with the development and its associated infrastructure coming forward.
- 9.12 From the VISSIM model, the overall network delay (in terms of seconds per vehicle) can be ascertained for each of the scenarios and peak hours assessed. The results are set out in **Figure 38** below. It should be noted that the Do Minimum, Do Something, and Do Something with Mitigation relates to predicted 2036 conditions. This is the best way to capture the overall highway network impacts, whilst individual junctions' impacts are reported more fully in the forecast VISSIM modelling reports.

Figure 38 – Network Average Delay, AM, and PM Peaks – North Walsham



- 9.13 The figures illustrate:

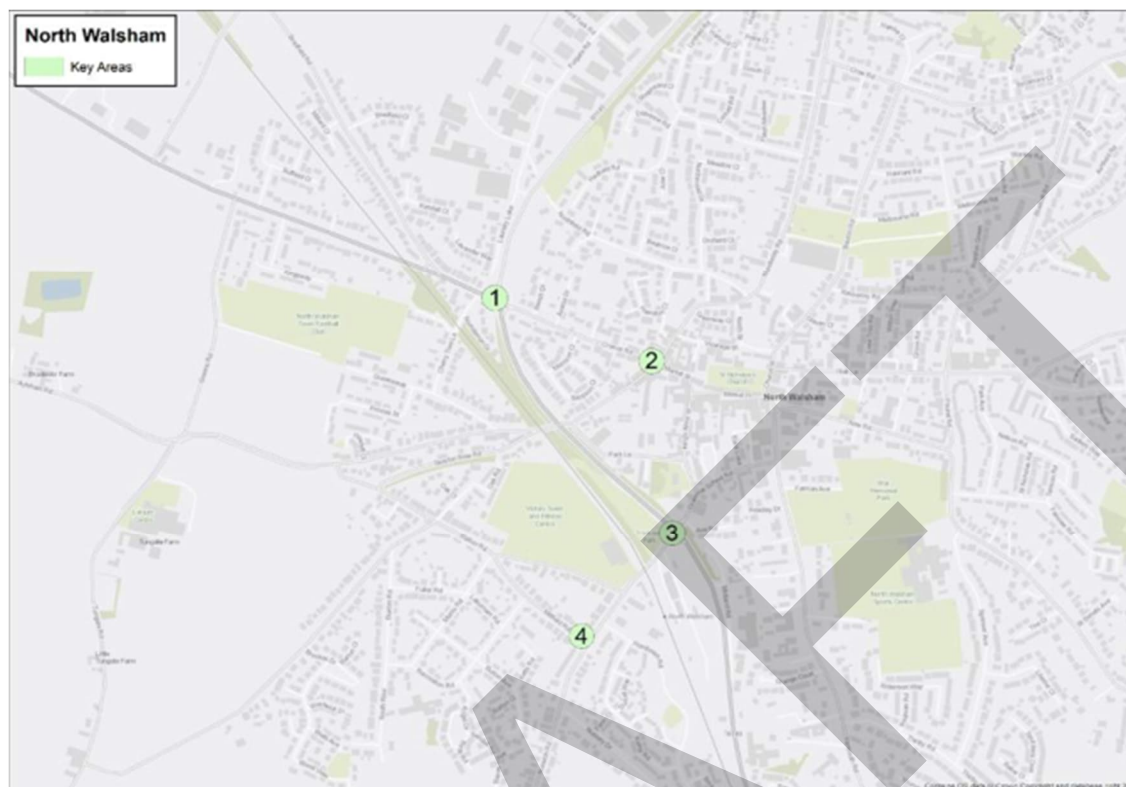
- The PM peak hour is the most critical scenario when delays are predicted to be greatest. During this time overall network delays are expected to increase from existing levels of 76 seconds per vehicle without the proposed development, to 129 seconds on average per vehicle. In the 'Do Something' scenario, where the proposed development and associated link road are added, overall network delays reduce to 115 seconds per vehicle.
- There is a slight increase in delay in the Do Something with Mitigation scenario caused by routing changes in the area due to the traffic management and pedestrian improvements measures on Aylsham Road and Skeyton New Road. Overall network conditions are predicted to be better in the future year with the proposed development and mitigation measures in place.
- In the AM peak, the average delay increases across the network with the proposed development and mitigation in place, however this increase is predicted to be less than all future year PM scenarios and is not considered to be significant.
- Overall network impacts are mitigated by the proposed development.
- It is also reasonable to expect that the significant pedestrian, cycle, and public transport improvements proposed as part of the allocation will impact car driver mode shares for background traffic and development trips, further reducing predicted network delays.

Junction Impact

- 9.14 The modelling identified four locations within the study area which have been identified from the survey data / observations as having the most significant impact on network operation. The four key junctions are:

- 1 – Cromer Road / A149 / B1145 signalised crossroads.
- 2 – Cromer Road / Aylsham Road / Mundesley Road signalised crossroads.
- 3 – B1150 Norwich Road / A149 / Grammar School Road signalised crossroads.
- 4 – Norwich Road / Millfield Road priority junction.

- 9.15 The junctions above are illustrated on **Figure 39** below.

Figure 39 – Key Junctions in North Walsham VISSIM Model

1 – Cromer Road / A149 / B1145

- 9.16 The percentage change assessment illustrates that there would be an increase in peak hour traffic flows of between 4% and 7% in 2036 at this junction once the allocation comes forward. The additional traffic is predicted to result in a small increase in queuing and delay when comparing the Do Minimum and Do Something scenarios. Queuing is shown to increase by a metre with delay increasing by two seconds.
- 9.17 Upon implementation of the mitigation on Aylsham Road, there would be a further slight increase in queues and delay when comparing the Do Minimum and Do Something with Mitigation scenarios. This increases to three metres in terms of queuing and four seconds in terms of delay.
- 9.18 The residual impact of the allocation on the Cromer Road / A149 / B1145 signalised junction is therefore considered to be negligible in both peak hours.

2 – Cromer Road / Aylsham Road / Mundesley Road

- 9.19 The percentage change assessment illustrates that there would be an increase in peak hour traffic flows of between 2% and 3% in 2036 at this junction once the allocation comes forward. The additional traffic would result in a negligible increase in queuing and delay when comparing the Do Minimum and Do Something scenarios. Queuing is shown to increase by a metre with delay increasing by one second.
- 9.20 Upon implementation of the mitigation on Aylsham Road, there would also be slight change queues and delay when comparing the Do Minimum and Do Something with Mitigation scenarios. Generally, there is no significant change in queues and delay with a one metre increase in queuing and one second increase in delay noted on Aylsham Road in the PM peak.
- 9.21 The residual impact of the allocation on the Cromer Road / Aylsham Road / Mundesley Road junction is therefore considered to be negligible in both peak hours.

3 – B1150 Norwich Road / A149

- 9.22 The percentage change assessment identifies that there would be a potential increase of between 9% and 11% in 2036 at this junction once the allocation comes forward.

- 9.23 This junction is predicted to experience delays in the future Do Minimum scenarios, with the proposed improvement scheme with pedestrian crossings in place. Those issues are further exacerbated through the provision of the proposed development and associated mitigation on Aylsham Road which causes traffic to reroute from Aylsham Rd and Millfield Road towards the B1150 Norwich Road. Capacity issues are predicted to be at their worst in the PM peak hour.
- 9.24 There is a predicted increase in delay of approximately 150 seconds in the AM peak when approaching from B1150 Norwich Road South between the Do Minimum and Do Something scenarios. The main capacity issue is the left-turn movement from B1150 Norwich Road to the A149 Northbound. This is creating extensive queuing on this approach blocking the left-turn flare.
- 9.25 As with the increase in delay, there is an increase in queues. The queues reported however are a moving queue created by not all vehicles clearing the junction during the green time. Although the queue length is shown within the model to increase over the peak hour assessed, by the end of the hour, vehicles waiting at the junction can all clear the junction and therefore the capacity issue is expected to be limited to the peak hours.
- 9.26 Further opportunities to increase highway capacity at this junction are limited to refinement of the traffic signal operation, which would be expected to deliver some benefits. The reported capacity issues are because of the capacity implications of providing pedestrian crossings and traffic management measures proposed for safety reasons and to promote sustainable travel, alongside traffic impacts arising from the proposed allocation, based on the worst-case traffic flows predicted.
- 9.27 Whilst highway capacity is not predicted to be mitigated in full at this junction, here are other factors to consider:
- The forecast traffic is overly robust (by an estimated 15%) and so impacts would be proportionally less in reality.
 - The improvements identified by NCC at the A149/ B1150 junction as part of the consented scheme design will improve facilities for pedestrians and cyclists accessing North Walsham Town Centre and railway station but do impact capacity.
 - The traffic management measures and pedestrian and cycle facilities on Aylsham Road will offer a wider benefit to both existing and new residents of North Walsham.
 - The proposed link road will deliver network resilience which does not currently exist which will help cater for the short periods where congestion is expected to occur.
 - Travel behaviour would be expected to alter to avoid these delays through peak hour spreading or travel by other means.
- 9.28 When all these issues are considered it is considered that the reported delays are unlikely to materialise and the wider network benefits arising from the proposals will act to manage future traffic demand through the junction.

4 – B1150 Norwich Road / Millfield Road

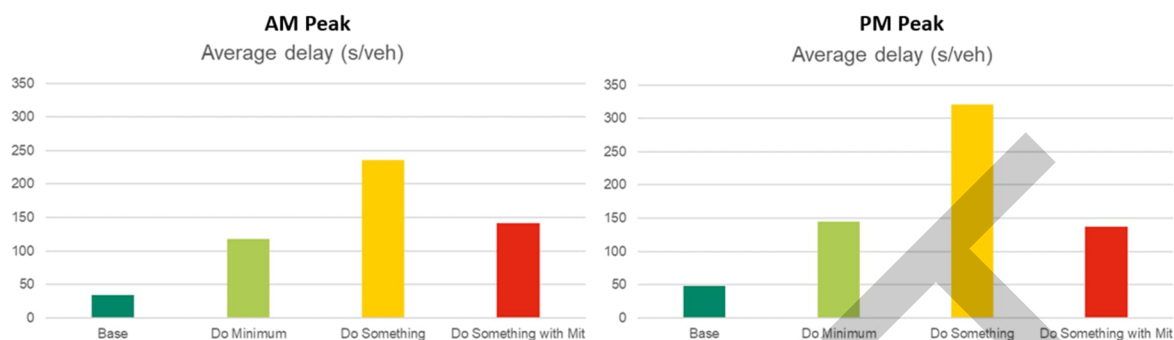
- 9.29 The percentage change assessment illustrates that there would be a change of between -3% and 7% at the junction. Millfield Road, which is currently utilised as the main route from B1150 Norwich Road to A149 Cromer Road by HGVs avoiding the low bridges would see a change of between -11% and -1% when comparing the Do Minimum and Do Something scenarios. This represents a benefit of the link road within the allocation. Once the mitigation on Aylsham Road is implemented, the reduction in traffic on Millfield increases to -14% in the AM peak however there is a small 6% (seven vehicle) increased identified in the PM peak due to some network congestion.
- 9.30 The modelling illustrates negligible changes to the queues and delays at the junction when comparing the different scenarios however there is potential for the junction to be impacted upon by the queues generated at the B1150 Norwich Road / A149 signalised junction.
- 9.31 The impact of the allocation on the B1150 Norwich Road / Millfield Road junction is therefore considered to be negligible in both peak hours, and predicted decreases in traffic flows on Millfield Road, and removal of HGVs would be of significant benefit to safety for residents.

Summary & Residual Impacts

- 9.32 The impact of the allocation and associated mitigation is considered to have a positive impact on overall highway network delay with improvements in the more critical PM Peak, when comparing both Do Something scenarios with the Do Minimum scenario.
- 9.33 There are capacity issues forecast at the B1150/ A149 signalised junction, which are predicted to worsen with the proposed allocation and associated measures in place however it is expected that these predicted queues are unlikely to materialise because traffic forecasting has been highly conservative (approximately 15% higher than expected in practice). In addition, the development delivers overall betterment through:
- Delivery of a new link road bringing network resilience, and a more suitable route for north south traffic and HGVs on the west side of North Walsham;
 - Removing traffic and HGVs from Station Road, Millfield Road, parts of Aylsham Road and Skeyton New Road; and
 - Delivery of comprehensive pedestrian, cycle and traffic management measures which will not only improve road safety but will encourage more sustainable trips by existing and future residents in North Walsham.
- 9.34 It is important that impacts on the B1150/ A149 junction are minimised through demand management measures and through promoting sustainable travel.
- 9.35 The forecast increase in eastbound traffic on Aylsham Road in the Do Something with Mitigation scenario will be mitigated by discouraging the use of Aylsham Road as a through route into North Walsham for general traffic, by staggering the Aylsham Road junction with the proposed new link road. This will reduce vehicle speeds on entry to Aylsham Road and make the use of this as a through route more difficult. It is also recommended that at planning stage further traffic management measures are explored to minimise the impact of traffic impacts on the narrow 20 mph section, such as designating the route for access only, provision of additional signage and provision of horizontal deflection to impose speed reductions for traffic.
- 9.36 Traffic flows on Skeyton Road are low and are forecast to remain low, but it is a well-used route by pedestrians and cyclists. Given that this is a residential lane, to avoid rat running along it, it is proposed to prevent vehicular traffic access from the proposed link road, and only allowing pedestrian and cycle traffic to cross the Link Road from Skeyton Road.
- 9.37 Furthermore, the promotion of active modes for local trips will be a priority through the investment in addressing gaps in the pedestrian and cycle network, and through delivering a highly accessible development area. Public Transport permeability and enhanced facilities will help drive public transport usage.
- 9.38 It is therefore considered that the allocation will on balance be capable of mitigating transport impacts and will deliver some overall betterment in North Walsham.

Results – Coltishall

- 9.39 To establish the impact of the allocation on the road network within Coltishall, the VISSIM model has been run for the 2036 Do Minimum and Do Something Development scenarios. This allows a comparison to be undertaken between how the road network would operate in 2036 without and with the development and its associated infrastructure coming forward.
- 9.40 From the VISSIM model, the overall network delay (as seconds per vehicle) can be ascertained for each of the scenarios and peak hours assessed. The results are set out in **Figure 40** below. It should be noted that the Do Minimum, Do Something, and Do Something with Mitigation relates to 2036 only.

Figure 40 – Network Average Delay, AM, and PM Peaks – Coltishall

9.41 The figures illustrate:

- Overall network delays in Coltishall are predicted to be slightly higher than average network delays predicted in North Walsham with the PM peak hour being the more critical period for the highway network.
- In the PM peak, existing levels of overall network delay are predicted to increase to almost 150 seconds per vehicle during the PM peak hour. It is however observed that the Do Minimum delay is greater than that identified for the Do Something with Mitigation scenario illustrates that whilst the allocation coming increases delay within Coltishall, the mitigation proposed would result delay be reduced to a level slightly below experienced in the Do Minimum scenario. This illustrates that the mitigation proposed would mitigate the highway capacity impacts on the network within Coltishall.
- In the AM peak, the average delay with the allocation and associated mitigation is higher than the AM Peak 'Do Minimum' scenario, however it is like the predicted residual delay in the PM Peak where impacts are less than the 'Do Minimum' scenario, without the allocation and mitigation in place.
- The conclusion is that whilst traffic growth will cause delays in Coltishall, the development highway capacity impacts are generally mitigated by the proposed improvements.

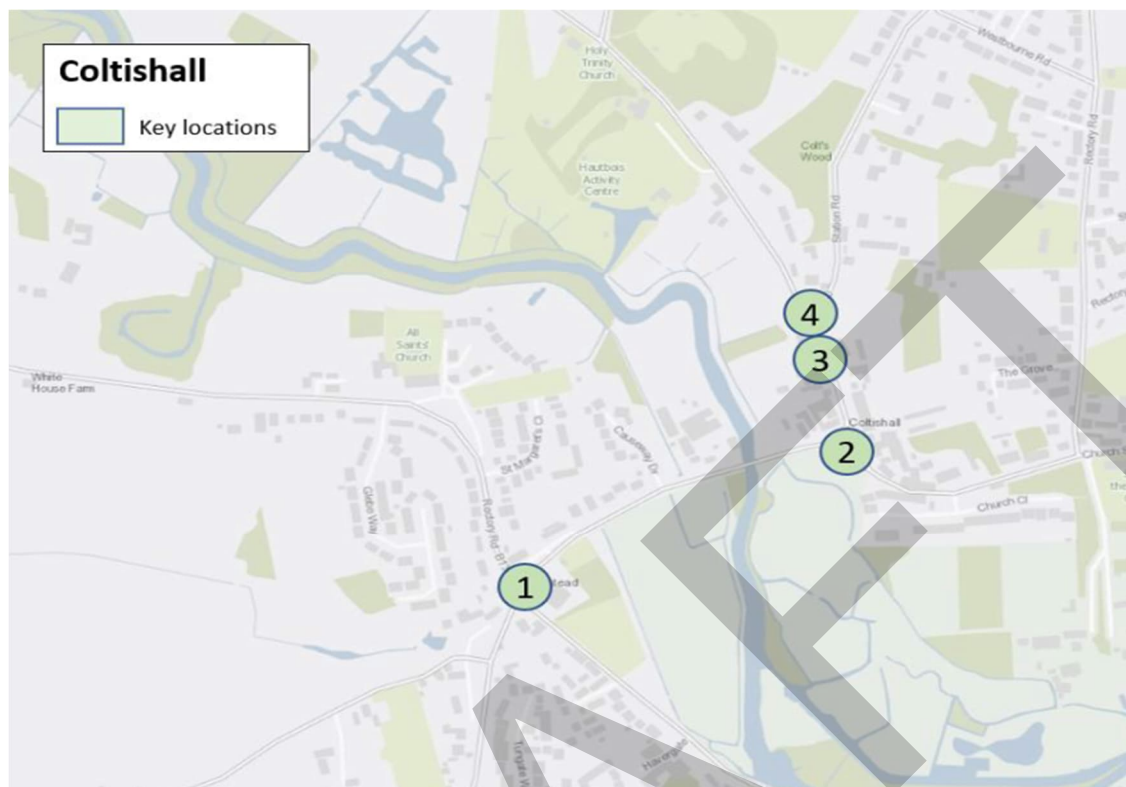
Junction and Link Impact

9.42 The modelling identified four locations within the study area which have been identified from the survey data / observations as having the most significant impact on network operation. The four key junctions and links are:

- 1 – Rectory Road / B1150 Norwich Road three-arm roundabout.
- 2 – B1150 Norwich Road / B1354 Church Street gyratory (PFS island).
- 3 – B1150 High Street.
- 4 – B1150 High Street / B1150 North Walsham Road / Great Hautbois Road priority junction.

9.43 The junctions and link above are illustrated on **Figure 41** below.

Figure 41 – Key Junctions in Coltishall VISSIM Model



1 – Rectory Road / B1150 Norwich Road

- 9.44 The percentage change assessment for the junction indicates that there would be between a 9% and 17% increase in traffic at the junction between the Do Minimum and Do Something scenarios. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.45 Queues on Rectory Road are shown to be negligible in both peaks in all scenarios with up to one PCU expected. The greatest increases are observed on B1150 Norwich Road where queues and delay are noted when comparing the scenarios. This is due to the main movement of traffic associated with the allocation being between the site and Norwich.
- 9.46 In the AM peak, queues would increase by some five PCUs in both directions whilst in the PM peak queues would increase by 17 PCUs towards Coltishall but only one PCU towards Norwich. In the AM peak the additional queuing would have little or no impact on adjoining roads except for Mill Road. The results for the Mill Road confirm little impact in the terms of queuing however there would be an increase in delay of up to 50 seconds, mainly for those turning right.
- 9.47 In the PM peak, queues are shown to increase such that they extend by up to 28 PCUs from the give way line at the junction along the B1150 Norwich Road. This would impact on the ability for vehicles to utilise the Frettenham Road junction. It is considered that any vehicles queueing would allow those vehicles waiting to turn into or out from the junction the opportunity to do so when there are gaps. A Keep Clear facility would allow vehicles to access Frettenham Road.
- 9.48 The proposed development is predicted to increase queueing at this junction by a maximum of 17 PCUs on the B1150 during peak periods. Whilst this queueing is a significant increase, queues dissipate within the peak hour. To provide additional highway capacity would require use of the adjacent land which operates as a car park for the Recruiting Sergeant pub and restaurant. Whilst the car park appears to be highway land, removal of the car park would lead to unregulated parking on the adjacent roads due to a lack of nearby alternative.

- 9.49 The level of peak hour queuing predicted is such that it can be accommodated on the road network for short periods of time. When considered on balance, as overall delays are not severe, and the assessment is based on traffic forecasts which are some 15% higher than is expected to be realised. Design highway mitigation to accommodate these robust traffic flows, would have a considerable impact on the existing businesses fronting the junction. The most appropriate way to mitigate impacts should be limit the demand in the first instance and ensure that there are no safety issues arising from the peak hour congestion. Provision of a Keep Clear across the access to Frettenham Road and examining the pedestrian facilities would assist in improving safety and mitigating impacts at this location. It is suggested that at planning stage, the need for capacity improvements within highway land is explored further if required.

2 – B1150 Norwich Road / B1354 Church Road gyratory (PFS Island)

- 9.50 The percentage change assessment illustrates that there would be an increase of between 14% and 15% in 2036 at this junction once the allocation comes forward. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.51 The additional traffic associated with the allocation would result in an additional delay of approximately 80 seconds on the eastbound approach to the junction in the AM peak with queues extending to some 390 metres. This is a result of traffic wanting to turn right into B1354 Church Street blocking through traffic from travelling northbound whilst also having less gaps in which to turn due to an increase in through traffic travelling southbound.
- 9.52 A right turn lane has therefore been identified, as described in Chapter 10, for implementation at the junction which assist in alleviating the blocking of through traffic by those vehicles waiting to turn right. The queues and delays observed in the Do Something with Mitigation scenario are shown to be like the Do Minimum scenario in the AM peak and significantly better than the Do Minimum (without the North Walsham Development) in the PM Peak.
- 9.53 The mitigation identified would therefore result in a beneficial impact on the junction and wider network within Coltishall by mitigating both the impact of the allocation and providing a small decrease in queuing and delay over what would occur without the allocation coming forward.

3 – B1150 High Street

- 9.54 The modelling results illustrate that in the AM peak there is negligible change in queues and delays on B1150 High Street in any of the scenarios.
- 9.55 Observations from the traffic surveys indicated on-street parking adjacent to the war memorial was impacting traffic flows along B1150 High Street. The carriageway adjacent to the war memorial is not marked as on-street parking and a bus stop is present although no cage is provided. Vehicles parking in this location create a narrowing of the carriageway which restrict vehicles to one-way movements and give-ways in place between drivers. Vehicles are observed to park here for long periods of time, but it does not front a residence and there is alternative parking available for nearby businesses.
- 9.56 In the PM Peak, due to this restriction, queues of between 21 metres and 117 metres occur in the Do Minimum scenario in the northbound and southbound directions respectively. The addition of traffic associated with the allocation increases these queues to 45 metres and 378 metres. This would impact on the Great Hautbois Road and access to residences whilst the northbound queue would impact on pedestrian crossing movements within the village centre.
- 9.57 To mitigate the impact of the allocation on B1150 High Street, it is proposed to provide a bus cage to formalise the existing bus stop and support bus access. This would remove the right to park immediately adjacent to the war memorial where there are no on-street parking bays. The existing marked on-street parking bays would not be impacted by the bus cage. The implementation of the bus cage would remove queuing and delay identified on B1150 High Street with the queuing and delay reduced to negligible levels.
- 9.58 The mitigation identified would therefore result in a beneficial impact on B1150 High Street and the wider network within Coltishall by mitigating both the impact of the allocation and the future increase in background traffic identified in the Do Minimum scenario.

4 – B1150 High Street / B1150 North Walsham Road / Great Hautbois Road

- 9.59 The percentage change assessment for the junction indicates that there would be between a 9% and 17% increase in traffic at the junction between the Do Minimum and Do Something scenarios. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.60 The modelling illustrates negligible changes to the queues and delays at the junction when comparing the different scenarios with queues reaching a maximum of one PCU and delay increasing by up to seven seconds.
- 9.61 The impact of the allocation on the junction is therefore considered to be negligible in both peak hours.

Summary & Residual Impacts

- 9.62 In Coltishall the volume of through traffic on the B1150 is predicted to increase by on average 250 vehicles (two way) in the peak hours which is significant.
- 9.63 With proposed mitigation measures in place on High Street and at the B1150/ B1354 Junction, the overall network delay decreases in the worst of the two peaks, the PM peak, when comparing both Do Something scenarios with the Do Minimum scenario. It is therefore considered that the allocation can be accommodated with the mitigation proposed for Coltishall with a residual beneficial impact on the network delay.
- 9.64 The proposed development is predicted to increase queueing and delays at the Rectory Road / B1150 Norwich Road junction. Providing additional highway capacity would require use of the adjacent land which operates as a car park for the Recruiting Sergeant pub and restaurant. It should be noted that the traffic volumes assessed are considered a worst-case scenario and test 10% higher development growth than proposed and assume very low levels of home working. Furthermore, the highest level of public transport service from North Walsham is focussed on the desire line of the B1150 through express bus services and the railway line, which has not been reflected in the traffic forecasting on this route. For these reasons, the level of forecast traffic is estimated to be at least 15% more than will be realised.
- 9.65 As traffic forecasts are estimated to be 15% higher than is expected to be realised it is proposed that these impacts are best mitigated in the first instance by limiting the demand and ensure that there are no safety issues arising from the peak hour congestion.
- 9.66 Bearing in mind the lack of alternative routes for traffic measures to mitigate the impacts of this growth in Coltishall have been identified:
- The impact on the B1150 and Coltishall is best addressed firstly through minimising the traffic growth on this route. The use of public transport will be actively promoted at the development through the proposed public transport strategy, incorporating a bus interchange for express services, and improved active travel access to North Walsham Station and target led travel planning.
 - At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant.
 - Creating greater awareness of the village entry and reduced speed limit on the approach to Horstead from the South would help reduce vehicle speeds. At planning stage additional signage should be identified.
 - Provision of a Keep Clear across the access to Frettenham Road to enable access in the event of queueing on the B1150 during peak hours.
 - Investigate the need for highway capacity improvements further at the B1150/ Rectory Road junction at planning stage.
- 9.67 Background traffic is also predicted to increase substantially by 2036 and any development growth increasing traffic on the B1150 should be looking at how it can assist NCC in mitigating any potential road safety impacts.

10. Mitigation Summary

Introduction

- 10.1 This chapter sets out the sustainable transport and highway mitigation measures identified as part of the TA of the proposed allocation at North Walsham. These measures support delivery of the proposed allocation in North Walsham and mitigate impacts. Given that the Local Plan allocations are yet to go through the examination process, these proposals are at various stages of detail. Where it was deemed necessary through liaison with the Highway Authority, to investigate some initiatives in further detail to test feasibility, this has been carried out. All proposals identified in this document will be taken forward for further development and implementation at planning stage.

Sustainable Transport Improvements

- 10.2 Given the scale of the allocation, along with ensuring that the proposed allocation provides a Primary School, amenity areas and a local centre on site to serve the needs of the development, it will also be important that this development has a meaningful TP in place to promote sustainable travel.
- 10.3 A TP for the development area will be prepared at planning stage identifying the bespoke measures to be adopted across the site to promote sustainable travel patterns. This will be prepared in line with the most recent NCC TP Guidance (July 2023) and implementation will be fully funded by the development.
- 10.4 To encourage the use of alternative modes to the private car for local trips in North Walsham and to access public transport, several improvements are proposed to the sustainable transport network both within the proposed allocation and off-site. These are detailed in Chapter 5 but in summary:
- 10.5 To deliver safe and convenient routes between the development area and North Walsham Town Centre and North Walsham Railway station focussed improvements where possible to the existing network along three 'Mobility Corridors' have been identified:
- Provide new signalised toucan crossings on Aylsham Road for pedestrians and cyclists to connect with PRow either side of the railway bridge.
 - Provide a new zebra crossing on Park Lane to connect to the existing footway and medical centre.
 - Provide a new footway on the southern side of Aylsham Road under the railway bridge to connect to the existing facilities whilst widening the northern shared footway/cycleway. This has been designed and subject to Road Safety Audit. Further details of this scheme are included in the following section.
 - Upgrade the pedestrian crossing on A149 Cromer Road to a zebra crossing.
 - Install tactile paving to the crossing at the A149 Cromer Road / Bradfield Road priority junction.
 - Close the eastern spur of the A149 Cromer Road / Bradfield Road priority junction and widen the footway to 2.0m.
 - Upgrade Weavers Way, where possible, between the allocation and Station Road in line with LTN 1/20.
 - Improve access from Weavers Way across Station Road. Potential to divert Weavers Way through the car park at Station Road and install a crossing point on Station Road.
 - Upgrade Weavers Way between Station Road and Aylsham Road in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility.
 - Remove the 50m pinch point on Weavers Way at the fenced-in section of Weavers Way next to 40 Oak Road from 2.5m to at least 4.0m to allow for a 3.0m wide pedestrian and cycle facility to be installed.
 - Upgrade PRow from within the allocation to Norwich Road in line with LTN 1/20, with a segregated 3.0m wide cycleway and 2.0m footway. This will be surfaced with asphalt and lighting will be added where sections are currently unlit.

- Upgrade the existing pedestrian crossing on Norwich Road, south of the railway bridge, to a signal-controlled crossing.
- Upgrade the existing shared pedestrian and cycle route between Aylsham Road and Norwich Road in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility. This will be surfaced with asphalt and lighting will be added where sections are currently unlit.
- Install an east-west pedestrian and cycle signalised crossing at the B1150 Norwich Road / A149 signalised junction.
- Provide clear shared pedestrian and cycle route from the B1150/ A149 junction along the B1150 leading to the railway station. This has been designed and subject to Road Safety Audit. Further details of this scheme are included in the following section.
- LTN1/20 compliant pedestrian and cyclist facilities along the length of the link road and throughout the allocation land.
- Provision of a new crossing on the link road for Weavers Way.
- Closure of Skeyton Road, at the point where it crosses the link road for vehicular through traffic but maintaining access for pedestrians and cyclists.
- Install a pedestrian crossing point between the allocation and the existing footway on Greens Road.

10.6 These measures are illustrated **on Figure 32 in Appendix F**.

10.7 A **Public Transport Strategy** has been identified which will include the following measures:

- Provide new bus stops, along with a bus interchange, within the allocation site.
- Divert services through the allocation land. A bus interchange, in the southern area of the allocation land will allow a turning area for the diversion of the X55 service, as well as the extended 33A service. The 33A and 6A services would be diverted along the new link road rather than Greens Road.
- Seek to increase public transport services outside of peak periods.
- Provide additional cycle spaces at the railway station near both platforms.
- Improved access to the railway station for active modes.
- Active promotion of public transport and engagement with the public transport operators through a TP.

10.8 Whilst **Coltishall and Horstead** sit outside of the walking and cycling catchment for the proposed allocation in North Walsham, it is on the bus route and as identified in this assessment the development will increase traffic levels making it more difficult for residents to cross the B1150. This is being addressed in the following ways:

- Promoting sustainable travel at the proposed allocation to reduce demand from traffic on the road network generally, including the B1150 through Coltishall and Horstead. Of relevance are the TP and Public Transport Strategy which will ensure that the public transport network is easily accessible to the proposed site, and actively promoted.
- The existing bus stop at the War Memorial will be formalised, creating a safer stopping arrangement for buses at Coltishall.
- At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant.
- Identify further signage and lining to reduce speeds on entry to Horstead from the South along the B1150 to reduce risks for crossing pedestrians.

10.9 The sustainable transport measures identified to serve the proposed allocation will not only benefit the proposed development but will also address existing shortfalls in facilities.

Highway Improvements

10.10 Improvements to the highway network in North Walsham and Coltishall have been identified to address capacity and traffic management issues identified as part of this assessment. These have been tested within the VISSIM modelling set out in **Chapter 9** to ensure that they assist in mitigating the impacts of the allocation and are beneficial to North Walsham and Coltishall. Where necessary these proposals have been designed and subject to Road Safety Audit.

10.11 The proposed improvements in North Walsham and Coltishall are set out in the following sections.

Link Road and Associated Junctions

10.12 The new link road through the allocation will provide a new connection between B1150 Norwich Road and A149 Cromer Road. The design of the link road and associated junctions is set out in **Chapter 4**.

10.13 This route, although residential in nature, has been designed to accommodate HGVs, buses and through traffic. It will not accommodate on street parking with parking needs provided for within the plots. The proposed link road will provide a significantly better route than that utilised at present, along Millfield Road, Station Road, and Greens Road.

10.14 The modelling illustrates that in 2036, some 600 to 700 vehicles would utilise the link road in the peak hours. And that the provision of the link road would mitigate the highway impact of the allocation before traffic management and safety improvements set out in the following sections are implemented.

10.15 Delivery of the new link road will provide greater network resilience in North Walsham, and a more suitable route for north south traffic and HGVs on the west side of North Walsham.

Aylsham Road

10.16 Aylsham Road is a key route within North Walsham for the movement of HGVs due to the railway bridge being 4.8m high and therefore capable of accommodating the largest high sided vehicles that need to traverse the town. This route is also a key corridor for pedestrian and cyclist trips between the town centre and the residential areas to the west including the proposed allocation despite the lack of adequate facilities especially under the railway bridge, where pedestrians were observed walking in the carriageway. Aylsham Road includes a very constrained section west of the railway bridge, where residential properties opening directly onto the road and there are no footpaths.

10.17 Whilst Aylsham Road is required for access and as a through route for higher HGVs and buses, it is not suitable for accommodating high level of traffic. To discourage the use of Aylsham Road wherever possible and to enhance the safety and pedestrian facilities several measures have been identified.

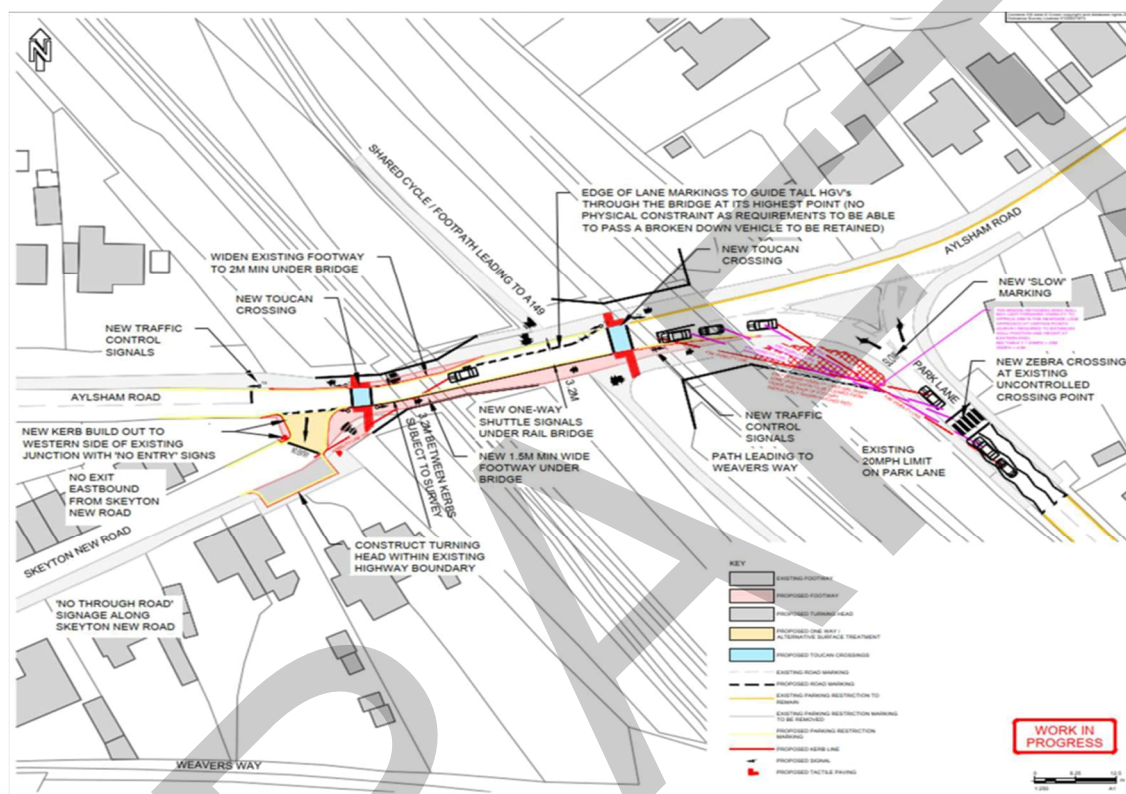
10.18 It is proposed to:

- Provide a signalised shuttle system at the railway bridge whereby one-way movements under the bridge are controlled by traffic signals.
- Enhance the facilities for pedestrians and cyclists through widening of the footway on the northern side to two metres and providing a new 1.5m wide (minimum) footway on the southern side.
- Reduce the width of the carriageway to 3.5 metres under the railway bridge, such that high-side vehicles can easily pass under the centre of the bridge, its highest clearance point and restrict passing of cyclists who would be using the carriageway.
- Provide two signalised crossings to assist pedestrians and cyclists to cross Aylsham Road, at either end of the shuttle system.
- Provide a Zebra crossing on Park Lane at the point where the footway ends to assist pedestrians in crossing and acting as speed calming measure.
- Cut back vegetation located within the visibility splay to assist vehicles travelling along Park Lane to see any queue relating to a red traffic signal.

- Change the access arrangements to Skeyton New Road at its junction with Aylsham Road to entry only, with all vehicles exiting Skeyton New Road via its junction with Station Road. The junction with Aylsham Road will be amended to slow vehicles with signage provided notifying drivers of the access arrangements. A new turning head will be provided on Skeyton New Road to assist larger vehicles in turning.

10.19 The proposed scheme is illustrated on **Figure 42** and included at **Appendix F**.

Figure 42 – Proposed Scheme – Shuttle System and Associated Improvements, Aylsham Road



10.20 The proposed design has been audited by NCC's Road Safety Team and updated to address problems raised. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**. The Designers response has been accepted by NCC.

10.21 The implementation of this scheme results in a slight increase in delay at the B1150 Norwich Road / A149 Norwich Road as vehicles divert to avoid Aylsham Road.

10.22 Furthermore, the proposed link road has been redesigned to discourage the use of Aylsham Road as a through route into North Walsham for general traffic, by staggering the proposed signal-controlled junction with the proposed new link road. This will reduce vehicle speeds on entry to Aylsham Road and make the use of this as a through route less attractive.

10.23 At planning stage further traffic management measures will be explored to minimise the impact of traffic on the narrow 20mph section, such as designating the route for access only, provision of additional signage and provision of horizontal deflection to impose speed reductions for traffic.

B1150 Norwich Road / A149 Junction

10.24 During a site visit with NCC's Road Safety Team, the consented improvements to the B1150 Norwich Road / A149 signalised junction were reviewed. It was identified that the improvements for pedestrians and cyclists on the southern side of the B1150 Norwich Road did not extend to the railway station and that existing facilities in this location were poorly defined for pedestrians and not suitable for cyclists.

10.25 Through liaison with NCC Highways team it was also identified that further pedestrian crossings were required at the signalised junction but had not been secured as part of the consented scheme.

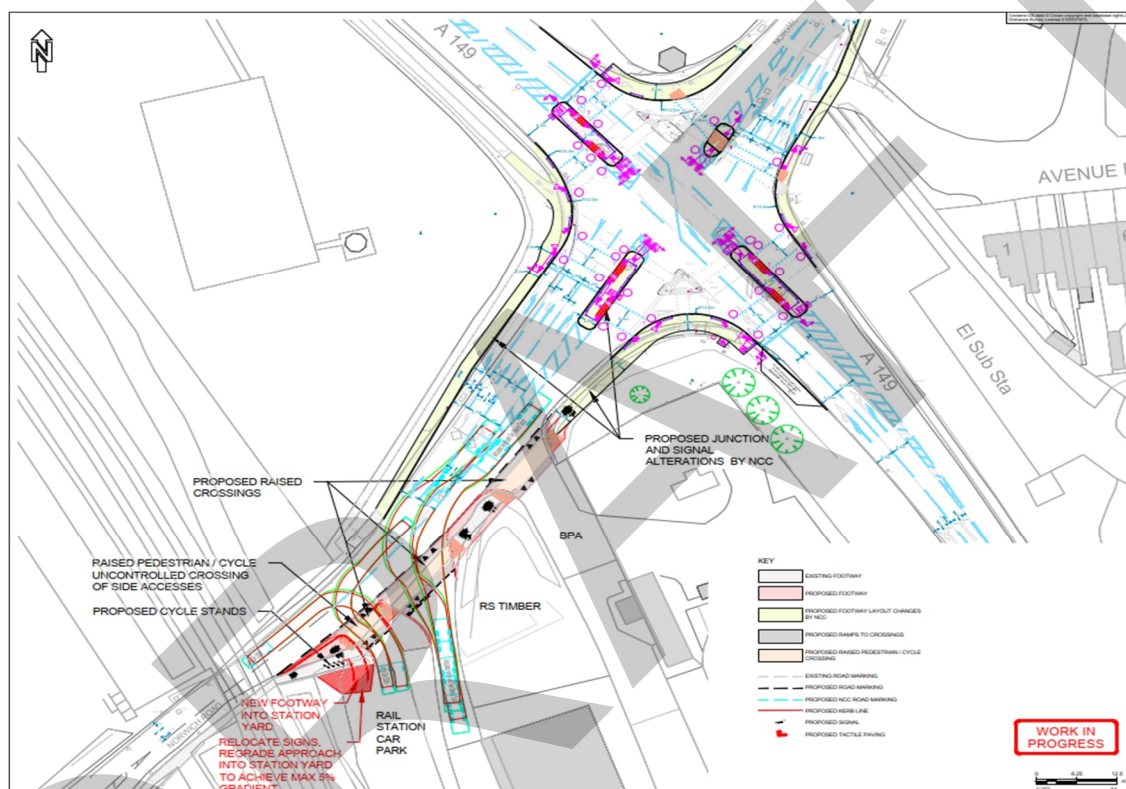
10.26 It is therefore proposed to extend the proposed widening of the existing footway along the southern of the B1150 from the end of the consented scheme to the railway bridge.

10.27 This would include:

- Widening the existing footway to three metres to allow for cyclist use.
- Provide raised crossings at the vehicular access points to indicate priority for pedestrians and cyclists.
- Provide tactile paving at point between the accesses to assist the visually impaired.
- Regrade the approach to the station by the junction with B1150 Norwich Road to achieve a maximum gradient of 5% and provide a new footway to reduce conflict with vehicles.

10.28 The proposed scheme is illustrated on **Figure 43** and included at **Appendix F**.

Figure 43 – Proposed Scheme – Pedestrian and Cyclist Improvements, B1150 Norwich Road



10.29 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the issues raised. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**.

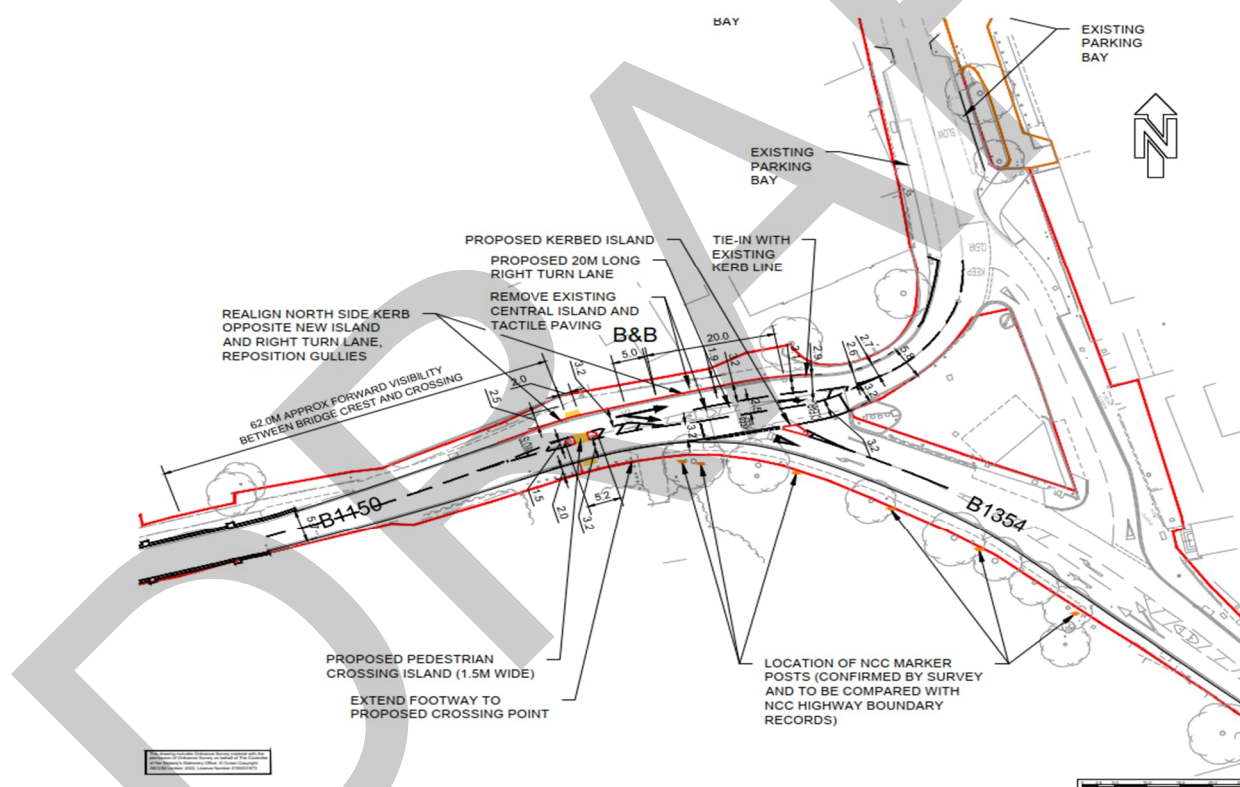
10.30 It should be noted that the drawing illustrating the improvements proposed as part of the allocation also illustrates the current consented improvement scheme for the B1150 Norwich Road / A149 signalised junction which is being brought forward by NCC as part of the consent for planning application PF/13/0866. This includes the additional signalised crossings on the B1150 south and the A149 west arms, which the proposed allocation will contribute towards.

B1150 Norwich Road / B1354 Church Road, Coltishall

10.31 The VISSIM modelling undertaken for Coltishall illustrated that queuing was occurring at the B1150 Norwich Road / B1354 Church Road junction in all scenarios assessed however it significantly increased when the allocations traffic was added to the network. This was identified as occurring due to vehicles turning right into B1354 blocking through traffic from continuing northbound. To resolve the blocking of through traffic and alleviate queuing in this area of Coltishall, a right turn lane is proposed.

- 10.32 A right turn lane is proposed which would be approximately 20 metres long and 2.5 metres wide and would result in the relocation of the existing pedestrian island and tactile paving. The pedestrian island would be relocated to the west of the right turn lane, avoiding the accesses to the Anglian Water pump house and the property, identified as 'Bridge House B&B'. Vehicular tracking of the accesses with the new pedestrian island in place has been undertaken and confirms that both accesses would continue to operate as at present. The new pedestrian island would be located some 62 metres from the crest of the river bridge which accords with the standards as set out within DMRB for forward visibility.
- 10.33 As requested by NCC's Road Safety Team, in addition to the 2.5-metre-wide right turn lane, the through lanes in this area will be provided at 3.2 metres to ensure that HGV movements can be made without encroaching on vehicles waiting to turn. To accommodate this the kerb line on the northern side of the carriageway would need to be realigned slightly.
- 10.34 Due to the constrained location, the design for this proposal has been undertaken using topographical survey information and validated highway boundaries to ensure deliverability.
- 10.35 The proposed scheme is illustrated on **Figure 44** and included at **Appendix F**. The red line on the figure illustrates the highway boundary information obtained from the NCC.

Figure 44 – Proposed Scheme – Right Turn Lane, B1150 Norwich Road / B1354 Church Road, Coltishall

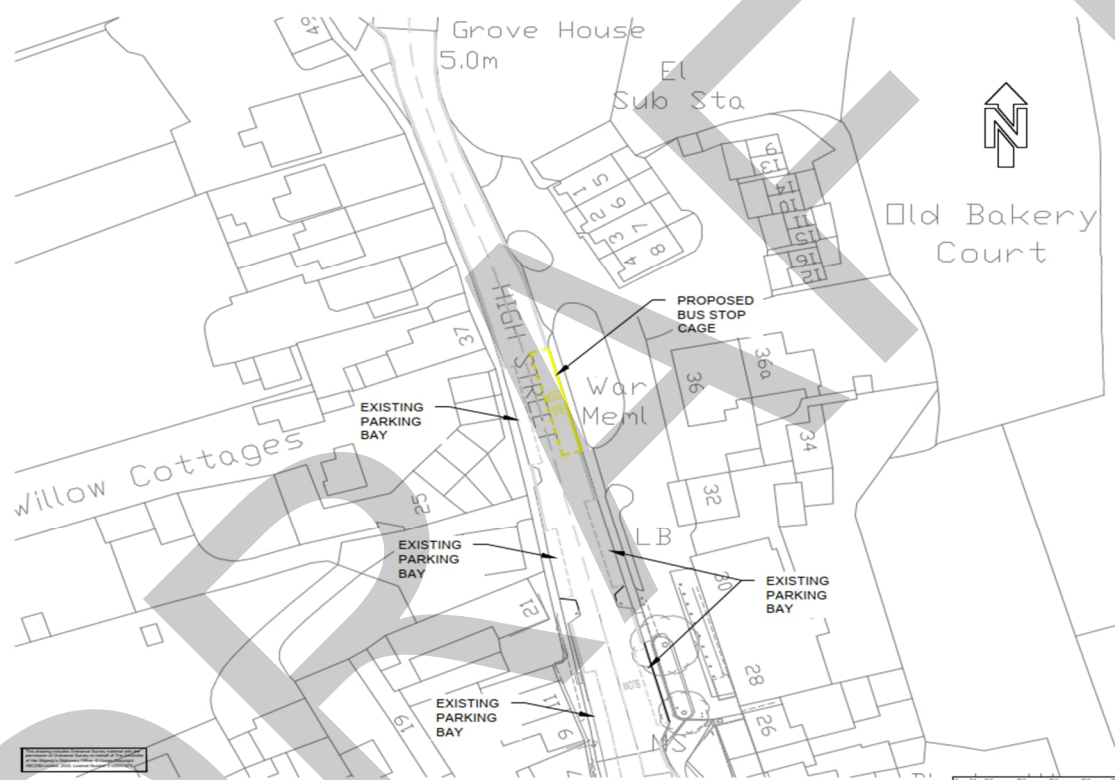


- 10.36 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the issues identified. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**. The Designers Response has been accepted by NCC.
- 10.37 The implementation of this scheme would result in a significant improvement to queuing at the junction such that the proposed improvement would result in mitigating the increase in queuing created by the allocation to levels estimated to occur in the Do Minimum scenario. It is therefore considered that the proposed right turn lane would be beneficial to the operation of the road network within Coltishall and would mitigate the development impacts.

B1150 High Street, Coltishall

- 10.38 It was observed during the traffic surveys carried out in November 2022 and on-site observations that vehicles currently park on B1150 High Street adjacent to the war memorial restricting access to the bus stop and impeding traffic flow.
- 10.39 To enable buses to utilise the bus stop safely, as well as aid with traffic movements through Coltishall, it is proposed to provide a bus stop cage on the carriageway adjacent to the war memorial. The provision of the bus cage as shown by the VISSIM modelling would result in a significant improvement in vehicular movements along the B1150 High Street during the peak hours with the queuing dissipating to negligible levels.
- 10.40 The proposals are illustrated on **Figure 45** and included at **Appendix F**.

Figure 45 – Proposed Scheme – New Bus Stop Cage, B1150 High Street, Coltishall



- 10.41 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the problems identified. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**.

Further Mitigation

- 10.42 Traffic flows on Skeyton Road are low and are forecast to remain low, but it is a well-used route by pedestrians and cyclists. Given that this is a residential lane, to avoid rat running along it, it is proposed to prevent vehicular traffic access from the proposed link road, and only allowing pedestrian and cycle traffic to cross the Link Road from Skeyton Road.
- 10.43 Provision of a Keep Clear across the access to Frettenham Road to enable access in the event of queuing on the B1150 during peak hours.
- 10.44 Investigate the need for highway capacity improvements further at the B1150/ Rectory Road junction at planning stage.

Phasing

- 10.45 As the phasing strategy for the proposed allocation is developed, the phasing for the associated mitigation measures will need to be defined.
- 10.46 There are views that the proposed link road should come forward as early as possible within the delivery horizon, however this needs to be balanced against funding availability and need. From both a capacity perspective and an access perspective.
- 10.47 Some key considerations in developing the phasing strategy will be:
- It is important that the first residents are encouraged to use sustainable travel in the first instance and for this reason safety measures and sustainable access measures should be delivered to address the needs of each phase as they come forward.
 - Delivery of the link road between B1150 and Aylsham Road should come forward earlier to avoid increased HGV traffic on Station Road and Millfield Road during construction and early phases.
 - Bus routing will need to be phased in accordance with the development build out programme and available routes.
 - Construction traffic should be accommodated on site, potentially through temporary haul routes until the link road is in place, to minimise impacts local residential roads.

Summary

- 10.48 A comprehensive package of mitigation measures have been identified in response to consultation and the detailed assessments undertaken. Where necessary deliverability has been interrogated through design and safety reviews.
- 10.49 The sustainable transport and highways improvements have been discussed with the highway officers at NCC with the highway improvements also have been through a Stage 1 RSA with NCC's Road Safety Team.
- 10.50 The proposals set out are considered to mitigate the impact of the allocation, are deliverable, and will provide beneficial enhancements to the existing network.

11. Construction

Introduction

- 11.1 This chapter sets out the potential mitigation measures which could be included in a full Construction Traffic Management Plan (CTMP), to help reduce the construction impacts on the surrounding highway network during the construction phase of the allocation.

Construction Impacts

- 11.2 At this stage it is considered premature to undertake a detailed assessment of construction vehicle impact, given that any such impact is largely dictated by the phasing and build programme of the allocation itself, which is currently unknown.
- 11.3 It is considered that the impact of construction traffic on the capacity of the local road network is anticipated to be relatively small overall. HGV movements would occur throughout the day, with a view to avoid peak times, and therefore would not add to peak hour traffic. The most significant impact would therefore be the journeys of construction workers travelling on the local road network. Despite this, construction hours are likely to dictate that staff are required to be at the site prior to the AM peak and leave after the PM peak.

Construction Traffic Management Plan

- 11.4 As a result of the sensitivities which surround construction vehicles and their impact, a CTMP could be developed and implemented during the entire construction period to mitigate any construction traffic impacts resulting from construction traffic relating to the allocation. If provided, the CTMP would provide a framework to sensitively manage all types of vehicle movement to and from the construction site.
- 11.5 The main aims of a CTMP are to ensure that there is no disruption to the local highway network, to spread deliveries throughout the day to avoid peaking of deliveries, and to restrict the number / volume of service vehicle movements during the morning and evening peak periods.
- 11.6 There are several potential mitigation measures that could be implemented during the construction period to mitigate any detrimental impact of construction vehicles on the surrounding highways network. Potential mitigation measures could include the following:
- Early delivery of phases of the link road to remove construction traffic from local roads where possible.
 - Use of sufficient clear signage to ensure that construction vehicles use only designated routes.
 - Routing of HGVs on main roads away from sensitive areas such as schools, residential areas, and areas sensitive in terms of air quality.
 - All heavy vehicle access to the allocation to be from the B1150 Norwich Road, B1145 Aylsham Road, or A149 Cromer Road with heavy vehicle movements through North Walsham or local roads being discouraged.
 - Time slots for bulk deliveries to ensure that convoys of vehicles do not arrive simultaneously.
 - Provision of holding spaces to avoid congestion on the local road network by waiting vehicles.
 - Coordination of abnormally large loads.
 - Scheduling of deliveries / collections away from peak hours, either before the AM peak or during the inter-peak daytime period.
 - Encouraging construction hours to avoid the AM and PM peak traffic periods for construction workers.
 - On-site recycling of materials to reduce export and import vehicle movements, including stockpiling topsoil for landscape works, or crushing existing hard standing material for engineering fill.
 - Keeping the access routes clear of mud using a road sweeper.
 - Implementation of wheel washing facilities to prevent debris being deposited on the highway network.
 - Implementation of appropriate traffic management to ensure that construction of the site access junctions does not give rise to undue disruption.

- Staff travel plan for construction workers, where possible using public transport/ car sharing to access the site.
- 11.7 It is considered that a CTMP could be conditioned as part of any planning permission. The CTMP would be tailored to the allocation to ensure that specific issues are identified and covered. The CTMP would be approved by the local authorities prior to implementation.
- 11.8 The impact of construction traffic on the capacity of the local highway network is anticipated to be relatively small overall as most HGV movements would occur through the day away from the peak periods and would not affect congestion on the surrounding highway network. Potentially the most significant impact could be the journeys of construction workers travelling to and from the construction site. However, this could be managed by ensuring construction hours are outside of the peak AM and PM periods.

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12. Summary and Conclusions

Summary

- 12.1 This report has been prepared by AECOM to present the findings of a Transport Assessment (TA) undertaken to accompany the Local Plan evidence application for a proposed mixed-use development on land west of North Walsham, Norfolk. The principal findings of the TA are summarised in the following paragraphs.
- 12.2 The allocation, identified in the Regulation 19 version of the NNDC Local Plan 2016-2036 as 'Land West of North Walsham (NW62/A)', is expected to deliver:
- Approximately 1,800 dwellings.
 - 7ha of serviced employment land.
 - Green infrastructure.
 - Community facilities, including a new primary school.
 - A road linking Norwich Road, Cromer Road, and the industrial estate.
 - Other required infrastructure improvements and mitigation including, but not limited to, health services, drainage, and power.
- 12.3 The allocation has been reviewed against National, Regional, and Local policy to ensure that the site is compliant. This has included a review against NPPF, NPPG, the existing North Norfolk Local Plan, the emerging Local Plan as well as transport policy adopted by NCC and Active Travel England. The allocation accords with the policies based on its sustainable location and being close to existing good quality public transport and in being a mixed development allows trips to be within the site reducing the impact on the wider network.
- 12.4 The site is located within reasonable walking distance of most amenities and facilities in North Walsham. As such, the site is well located in terms of opportunities for education, retail, and employment. The Weavers' Way footpath runs through the allocation, connecting to existing infrastructure to the west of the railway line. There are some areas in North Walsham where pedestrian and cycling facilities are poor and require improvement.
- 12.5 The allocation also benefits from already being well serviced with most of the allocation within 400 metres of an existing bus stop. The bus network in North Walsham provides good access to the Norfolk coast and Norwich, as well as a circular route around North Walsham. Visitors and residents of the allocation will also benefit from being closely located to North Walsham Train Station which provides regular services to Norwich and Sheringham. The journey time by rail to Norwich is faster than by road. The station at Norwich allows for wider regional/national travel, which provides a suitable alternative to using a private car. It is noted that travel outside of the peak periods is somewhat limited and therefore it is anticipated that the increase in patronage brought forward by the allocation will assist in allowing further services outside of the peak periods to be provided.
- 12.6 In terms of the local highway network, the allocation benefits from being located close to some of the main roads into and out of North Walsham avoiding reliance on routing through the town centre.
- 12.7 The railway line crosses the highway network in North Walsham on four occasions and restricts the movement of high sided HGVs and PSVs to certain routes within the town. Analysis shows that the dominant HGV route west to east is via the A149 Cromer Road with a small number higher sided vehicles and buses using Aylsham Road.
- 12.8 The B1150 is a dominant desire line for travel towards Norwich and there are existing constraints as it passes through Coltishall and Horstead.

12.9 A comprehensive assessment has been undertaken including surveys recording traffic volumes, composition, turning movements, speeds, journey times and routes. Accident data has also been gathered and analysed to understand any key issues on the receiving highway network. The assessment scope has been developed in liaison with NCC and has been informed by Microsimulation models of both North Walsham and Coltishall.

What are the Transport Impacts?

12.10 Assessment of the proposed allocation transport impacts remains underway informed by extensive surveys, and Microsimulation models of North Walsham and Coltishall developed in consultation with NCC. Findings to date have shown that the proposed allocation can be delivered without severe impacts. Any offsite impacts will be mitigated in full through an integrated multi modal access strategy and off-site capacity improvements.

12.11 The trip generation for the proposed allocation has been determined for all modes and for all uses. This process has made a series of conservative assumptions to add robustness to the assessment.

12.12 Future year flows have been identified by applying TEMPro growth factors to the 2022 traffic count data to reflect future background growth which includes the traffic associated with the proposed 343 dwellings at the Hopkins Homes development in North Walsham and the Scottow Business Park development near Coltishall.

12.13 The 2036 future year traffic flows used for this assessment represent a very robust scenario for the following reasons:

- A total of 2,000 dwellings have been assessed rather than the 1,800 identified within the allocation policy, to allow a conservative estimate of development impacts to be tested;
- No allowance for mode shift in background traffic has been made, despite transport policy being focussed on supporting more sustainable travel patterns and modes;
- Future mode shares at the residential development have been assumed to reflect a reduction of car driver trips by ten percentage points from Census 2011 levels in North Walsham. Bearing in mind the improved level of local public transport provision since 2011, increased reliance on home working, changing travel patterns this is a conservative design case;
- No mode shift has been assumed for employment uses, and local internalisation is assumed to be minimal; and
- The most dominant route for highway traffic from the proposed development has been identified to be along the B1150 towards Norwich. This route also accommodates the most significant public transport services, and the likely higher take up of public transport along this desire line has not been reflected in the analysis.

12.14 Taking all these factors into account, the forecast traffic flows are considered to have a safety factor of 15% incorporated (i.e., they are 15% higher than they are expected to be in reality). The reason for this is that it is early in the process, and for Local Plan allocation a high-level understanding of the issues to be addressed needs to be understood to prove deliverability.

12.15 To determine the impact of the allocation, four separate AM and PM peak scenarios have been assessed. These include:

- Base – 2022 Surveyed traffic flows.
- Do Minimum – Base flows growthed to 2036, with the existing highway network and the consented improvement scheme at the A149 / B1150 signalised junction.
- Do Something – Trip generation for the allocation added to the Do Minimum traffic flows.
- Do Something with Mitigation – Do Something traffic flows and the mitigation proposals included in the VISSIM models.

- 12.16 A percentage change impact assessment was undertaken to identify the change in traffic at the junctions within the VISSIM models in both North Walsham and Coltishall. This identified that, generally, there is an increase in traffic at each of the key junctions assessed. The increase in traffic on junction approaches in North Walsham is generally less than 60 vehicles per hour in all periods, except for B1150 Norwich Road where the residual % impact reaches 20%. This is largely because the proposed link road allows traffic to redistribute more efficiently and caters for the growth in traffic. On Norwich Road capacity improvements at the B1150/ A149 junction which are committed and under design by NCC provide for traffic growth and allow traffic to be attracted to this route.
- 12.17 Traffic is however predicted to decrease on Greens Road, Station Road, Millfield Road, and Skeyton New Road because of the allocation.
- 12.18 In Coltishall, traffic volumes will increase, and this is due to the lack of alternative routes. This impact needs to be considered in terms of both highway capacity and pedestrian crossing activity.
- 12.19 The forecast results for network delay in North Walsham illustrate that in the PM peak, the most critical time on the network, the average delay is greatest in the Do Minimum scenario in the PM peak, i.e., without the proposed allocation in place, but with developments such as Scottow Business Park and the Hopkins Homes site in North Walsham. The allocation and its associated mitigation therefore results in a betterment in terms of network delay in North Walsham over that which would occur if the allocation were not to come forward.
- 12.20 The assessment of individual junction impacts highlight that the B1150 / A149 signalised junction in North Walsham suffers an increase in queueing and delay in all scenarios even with the capacity improvements coming forward. The queues increase over the hour however by the end of the time, the queues have cleared the junction, limiting this to a peak hour impact. It should be noted that these delays are caused in part by enhanced crossing facilities for pedestrians and cyclists and traffic management measures on Aylsham Road, which cause traffic to re-route. Given the fact that traffic forecasts are very robust, and that whilst peak hours only were assessed, in practice peak hour spreading and mode choice would be expected to avoid this network constraint, delays are unlikely to materialise, and the betterment for active modes and safety outweigh the need to increase vehicular capacity.
- 12.21 In Coltishall, the modelling illustrates similarly to North Walsham, the greatest average delay occurs in the PM peak. This results also illustrates that once the mitigation proposed as part of the allocation would have a beneficial impact on network delay reducing it to lower levels than would be experienced in the Do Minimum scenario. Mitigation on High Street and at the B1150/ B1345 junction has been identified to successfully ease network constraints but there are residual delays predicted at the Rectory Road/ B1150/ Mill Road junction. There is potential for further improvements to be investigated at this junction at planning stage, but this will need to be balanced against the needs of pedestrians and the adjacent Recruiting Sergeant. As with North Walsham, the modelled forecast traffic flows are very robust, some 15% higher than anticipated in practice. The residual impacts are not considered to be severe.
- 12.22 The volumetric increase in through flows in Coltishall and Horstead is significant enough to impact on pedestrian crossing activity and safety. As such it has been identified that proportionate contributions towards improvements to pedestrian crossing facilities on High Street at Ling Way and in Horstead will be required at planning stage and following the outcome of safety review work underway by NCC.

What will the allocation deliver?

- 12.23 The proposed allocation will deliver a comprehensive package of measures to provide safe and sustainable access to the development and to mitigate development impacts along with proportionate contributions. These will be phased as the allocation comes forward, however the precise details of the phasing is still to be determined. The following measures have been identified:

- A funded, target led **TP** to promote sustainable travel at the proposed allocation land, in accordance with the most recent NCC guidance.

Walking & Cycling

- A network of interconnected streets, squares, green corridors, and public spaces which prioritise moving around on foot and by cycle over the use of private motor vehicles;
- Attractive and convenient connections for walking and cycling to adjacent areas;

- Enhancement of existing PROWs through the site, including Weavers Way;
- Provision of extensive off-site pedestrian and cycle route improvements to the town centre, key services, and railway station focused on the three key 'Mobility Corridors' between the development, the Town Centre, and Railway Station; and
- Increased cycle parking at NW Railway Station, on site Travel Hub and at all public spaces on site.

Public Transport

12.24 Public transport measures on site providing facilities and regular services to/from the town and key services including:

- On-site travel hub for bus/ travel interchange, to attract express services into the site;
- Permeability of the site to bus services along the development Link Road;
- Provision of bus stops along development frontage and within the site with high quality facilities;
- Diversion of services through the site and service enhancements, outside peak periods; and
- Access to rail supported through 'Mobility Corridor' cycle improvements and enhanced station cycle parking.

Traffic Management

12.25 Delivery of a new road designed as an attractive main residential street through the development with mixed-use frontage usages and segregated cycle paths and footways. This new road will be suitable for HGV traffic (including high sided vehicles) and will connect Norwich Road to Cromer Road via two new roundabouts and will form a signalised junction with Aylsham Road.

12.26 The Access Road will:

- ✓ deliver greater network resilience in North Walsham;
- ✓ mitigate the development impacts, other than some predicted congestion on B1150 Norwich Road at the junction with the A149;
- ✓ lead to a substantial reduction in traffic on Station Rd, parts of Aylsham Rd, Green Rd, Millfield Road, Tungate Road, Skeyton Road, and Skeyton New Road of between 10-30%;
- ✓ result in traffic reductions on the A149 between Norwich Rd and Cromer Rd;
- ✓ accommodate more efficient HGV routing, reducing HGV traffic on Station Road;
- ✓ manage the use of Aylsham Road with traffic signals and breaking the through route across the link road;
- ✓ no significant increase in traffic on Bradfield Road, north of the railway, with only the residential uses north of the railway adding light vehicles;
- ✓ Green Rd will be stopped up and access to the Football Club will be improved; and,
- ✓ Close Skeyton Road and Skeyton New Road to through traffic.

12.27 A signalised shuttle one-way system is proposed at the Aylsham Road railway bridge to manage traffic demand and improve safety for pedestrians and cyclists.

12.28 Off-site capacity improvements are identified in Coltishall with a Bus Cage on high street preventing obstructive parking, and a new right turn lane arrangement with associated pedestrian facilities at the B1150/B1354 junction in Coltishall.

12.29 Car parking, Blue Badge Holder car parking, and cycle parking will be provided in line with the standards applicable at the time of any application. The current standard applicable are set out in NCC Parking Provision Guidance 2022. No parking will be provided along the link road, with all parking requirements provided for on plot.

12.30 The improvements proposed to the highway have been subject to a Stage 1 Road Safety Audit undertaken by the NCC Road Safety Team. Audit reports and Designers Responses have been prepared and agreed with NCC.

Northern Link

- 12.31 Due to the uncertainty regarding the proposed northern extension of the link road along Bradfield Road and into Folgate Road through the industrial area north of North Walsham, and since it is not within the control of the proposed allocation landowners to deliver, the Northern Link does not currently form part of the proposals and this assessment has been completed assessing the development impacts in the absence of a Northern Link. Further transport justification for this position is set out in the AECOM Technical Note 'Assessment of need for Northern Extension of Western Link Road to support the Western Urban Extension of North Walsham'. The proposed allocation will allow for future provision of this link if it comes forward through the allowance for land for future upgrades to Bradfield Road.
- 12.32 Construction of the allocation will be considered at detail in future planning application but for the purposes of this TA, potential mitigation measures have been identified to be implemented through a Construction Traffic Management Plan.

Conclusion

- 12.33 In conclusion, it is considered that the transport impact of the proposed allocation for housing west of North Walsham can be mitigated through the provision of improvements to both the sustainable transport and highway network. The assessment undertaken includes a high level of robustness and the mitigation measures identified have been tested and illustrated to be deliverable. Any residual impacts are not considered severe in the context of paragraph 111 of the NPPF and are outweighed by the positive impacts of the proposals this development will bring forward.

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