West Winch Housing Access Road

Outline Business Case

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1.1 Overview

1.1.1 This Outline Business Case (OBC) for the West Winch Housing Access Road (WWHAR; the scheme) has been prepared on behalf of Norfolk County Council (NCC) for consideration by the Department for Transport (DfT).

1.1.2 The content and preparation of the business case adheres to published DfT guidance, including the most up to date transport appraisal guidance (TAG) and Value for Money framework.

1.1.3 It updates and builds on the Strategic Outline Business Case (SOBC) submission, which was approved by DfT in July 2022. The business case demonstrates that the proposed scheme is based on analysis of the current situation, a clear vision for the future, a careful consideration of options, a robust appraisal of costs and benefits, and a clear plan for delivering the scheme.

1.2 Background to the Scheme

1.2.1 The South-East King's Lynn Strategic Growth Area (SEKLSGA), also known as the West Winch Growth Area (WWGA), has been identified in the King's Lynn and West Norfolk Local Plan as the primary site for substantial housing development. This development comprises 4,000 new dwellings on land between the A10 and A47. The site has been selected as the only location available in the area for such levels of growth due to flooding constraints elsewhere, and its proximity and links to King's Lynn. The town is home to the Port of King's Lynn which can be accessed by road from the A10 and A47 from the south. The housing development cannot come forward without new highway infrastructure to mitigate the impacts of the additional traffic demand.

1.2.2 Considering King's Lynn is up to 50 miles away from the regional centres of Peterborough, Cambridge and Norwich, the town is therefore an important service centre and economic driver to a sub-region with a population of over

150,000. King's Lynn is a hub for many neighbouring, smaller rural settlements and offers employment opportunities as well as a range of services in terms of retail, healthcare, and social. The strategic importance of King's Lynn will continue to grow as the town supports significant residential development in adjacent rural settlements such as West Winch. For this reason, King's Lynn is the focus of the analysis undertaken in Section 2.2 due to its position as a sub-regional centre.

1.2.3 The village of West Winch lies to the west of the existing A10, 4km south of King's Lynn. The existing A10 connects King's Lynn to Ely, Cambridge, and further south to London, it is therefore strategically important to the region and is heavily used by commuters, visitors and haulage companies. A traffic count undertaken in 2019 on the A10 immediately to the south of West Winch identified a daily flow of approximately 20,000 vehicles, of which over 11% are HGVs (source: DfT Road Traffic Statistics). As a result of this many vehicles travel through West Winch as part of their journey, causing severance, difficulty for residents to emerge from side roads and impacts on the amenity of the village. With many residential properties within the village bordering the road there is an ambition to provide a bypass of the village for through traffic. Further, additional capacity is required to cater for the increase in travel demand as a result of the planned housing growth.

1.2.4 NCC is working in partnership with the Borough Council of King's Lynn and West Norfolk (BCKLWN) to expedite housing delivery and coordinate the provision of the required highway infrastructure in the West Winch area. This comprises the WWHAR which includes improvements to the Hardwick Interchange, dualling of a section of the A47 and a new housing access road between the A47, just east of Hardwick Interchange, and the A10, to the south of the village of West Winch.

1.2.5 The BCKLWN has carried out viability work for the growth area and produced an Infrastructure Delivery Plan (IDP). This has identified significant infrastructure requirements to enable the delivery of 4,000 new homes, incurring substantial costs. Viability work undertaken for the IDP identified that

the housing development could not contribute the full cost of the road infrastructure in addition to the build costs of the housing and supporting infrastructure. The IDP identified that the housing development could contribute some £13m (in 2018 prices) towards the WWHAR, but not fund it all. For this reason, government funding is being sought to support the project.

1.2.6 NCC and BCKLWN are currently developing the planning application for the WWHAR, which is expected to be submitted in December 2023. Alongside this, NCC and BCKLWN have undertaken the development of the OBC for the WWHAR scheme. Transport East, the Sub-national Transport Body for the area, included the WWHAR as one of its priorities for Major Road Network improvements when it submitted its Regional Evidence Base (REB) in July 2019. Transport East has recently reconfirmed its support for the scheme and this OBC submission to government.

1.2.7 The WWHAR scheme will deliver a number of highway interventions within the vicinity of the development ensuring the site is connected and that the highway network can cope with the increase in demand. The main elements of the WWHAR scheme include:

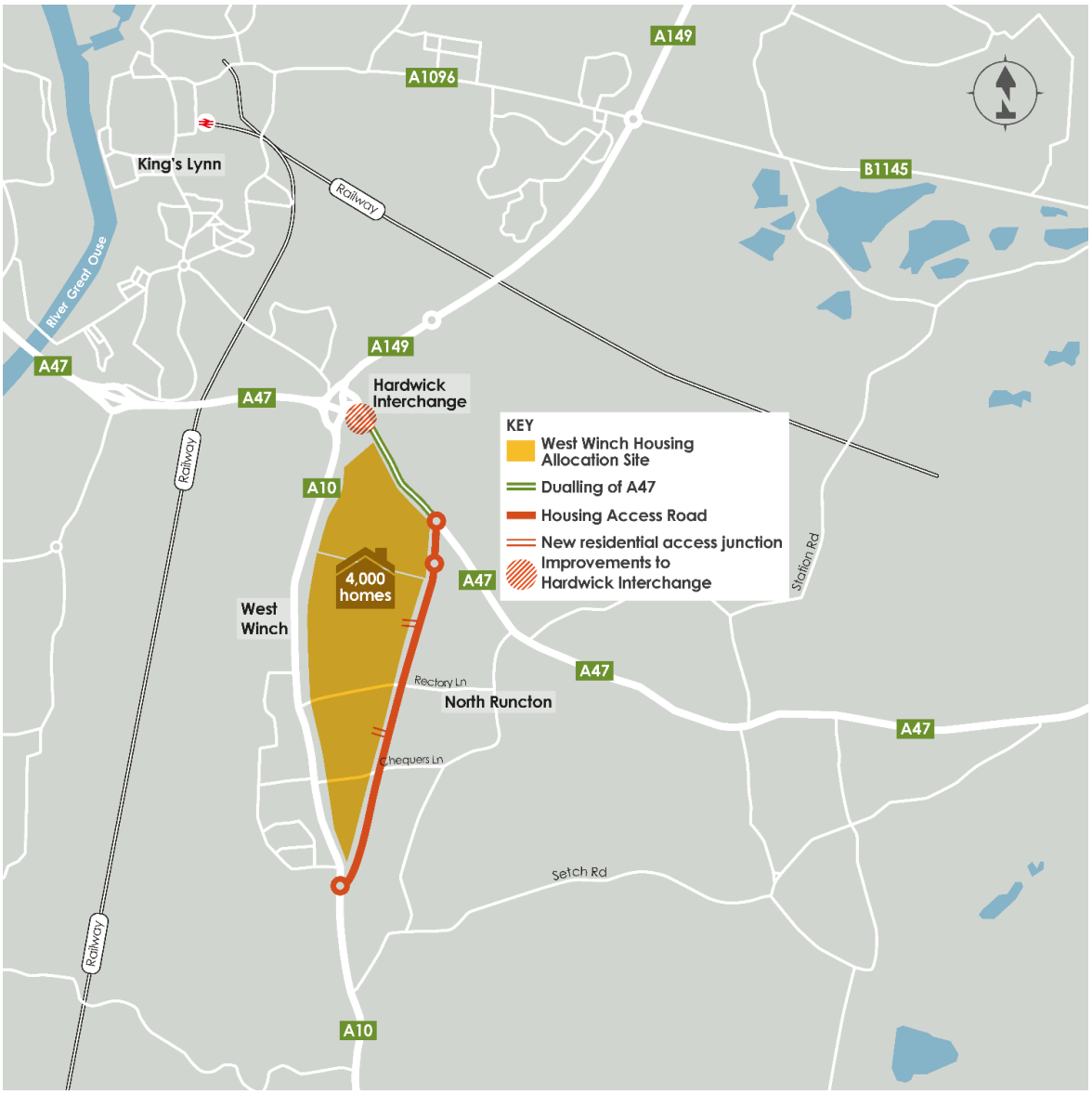
- A housing access road to the east of West Winch connecting the A47 with the existing A10
- A roundabout on the housing access road providing access to the Hardwick Green (i.e. Hopkins Homes) planned development
- Two roundabouts on the housing access road to serve proposed dwellings that are outside the planned Hardwick Green development
- A roundabout on the housing access road, at its southern end, providing a connection to the existing A10
- A signalised roundabout junction where the housing access road meets the A47
- Modifications to the existing Hardwick Interchange to accommodate additional housing traffic plus re-orientation of trips through the junction

(these modifications include new east-facing slip roads and changes to the Interchange's circulatory carriageway)

- Dualling of the existing A47 between Hardwick Interchange and the housing access road
- Treatment of local roads severed by the housing access road

1.2.8 Figure 1.1 below shows location of the WWHAR scheme.

Figure 1.1 – Scheme location



1.3 Purpose of this OBC

1.3.1 Following on from the SOBC submitted to the DfT in March 2021 and approved in July 2022, further work for the WWHAR scheme has been undertaken to progress its design and development towards delivery.

1.3.2 This OBC builds upon the work and analysis undertaken as part of the SOBC, reconfirming the case for change and appraisal, as well as providing further detail about the financial and commercial delivery of the scheme.

1.4 Structure of this OBC

1.4.1 The structure of this OBC is as follows:

- Chapter 2 presents the **Strategic Dimension:** The Strategic Dimension confirms the case for change and evidences the option development
- Chapter 3 presents the **Economic Dimension:** The Economic Dimension presents the scheme options and their Value for Money appraisal
- Chapter 4 presents the **Financial Dimension:** The Financial Dimension undertakes the affordability analysis for the scheme
- Chapter 5 presents the **Commercial Dimension:** The Commercial Dimension assesses the commercial attractiveness of the scheme
- Chapter 6 presents the **Management Dimension:** The Management Dimension sets out the scheme's delivery arrangements

2 Strategic Dimension

2.1 Introduction

2.1.1 The Strategic Dimension sets out the case for change, confirming the need for intervention, which was set out at SOBC stage, as well as outlining the option development process to date. An updated Options Assessment Report (OAR)

has been produced for the WWHAR scheme (refer to separate document Appendix A). It reconfirms the suitability and feasibility of the preferred option identified at SOBC stage.

2.1.2 The preferred scheme option identified at SOBC stage enables the full housing allocation on the West Winch Housing Allocation site to come forward. The preferred option has been revisited to include active travel, travel management, and bus priority options. This is in response to increased policy emphasis on carbon savings, climate change and increased requirements for Biodiversity Net Gain since the preparation of the SOBC in early 2021.

2.1.3 The Strategic Dimension has been developed in line with HM Treasury Business Case guidance and the DfT's Transport Analysis Guidance (TAG).

2.2 Strategic Context

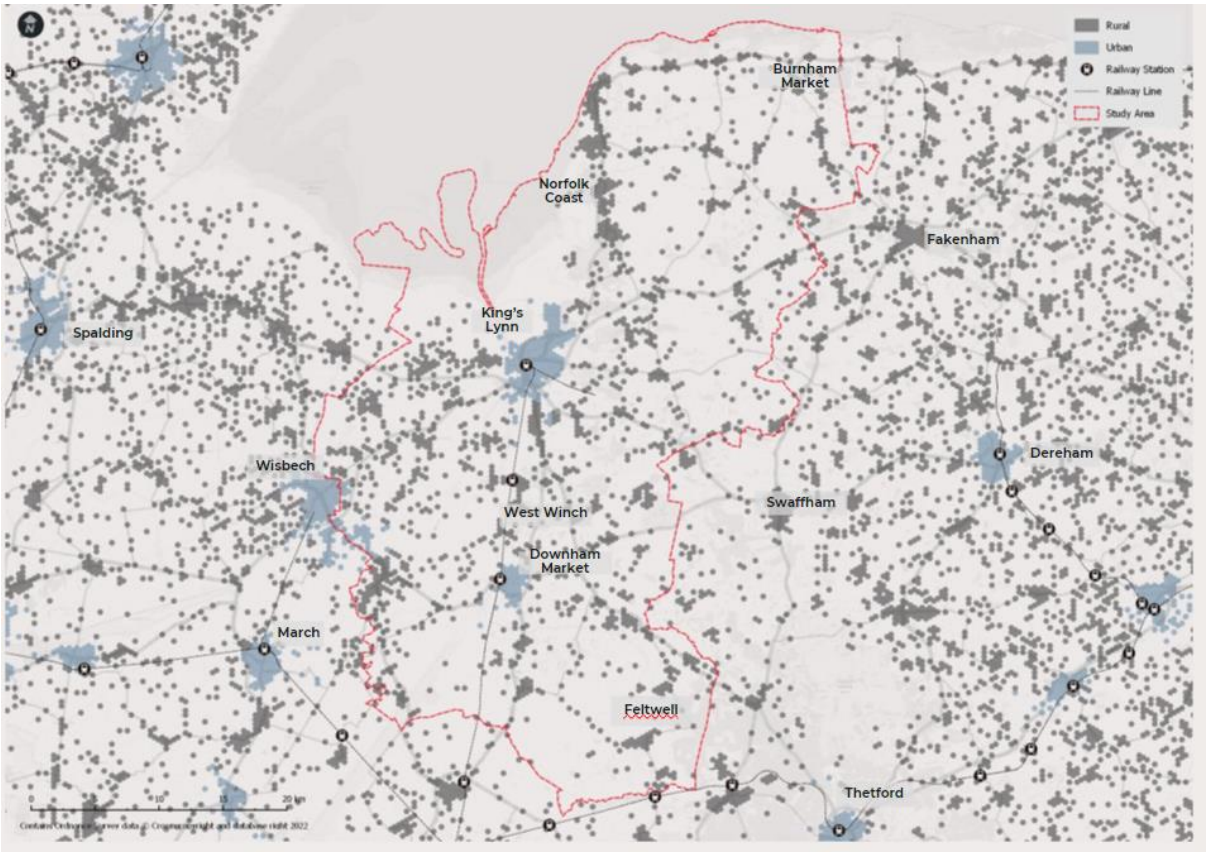
2.2.1 This chapter sets out the existing conditions in terms of socio-economic context, transport and environment.

Demographic Profile

2.2.2 The borough of King's Lynn and West Norfolk is comprised of 102 parishes, with the port and market town of King's Lynn the largest urban settlement in the district. It is one of seven second tier district councils within the Norfolk County Council (NCC) area.

2.2.3 Figure 2.1 shows the study area, the concentration of rural and urban settlements, as well as key railway lines and stations.

Figure 2.1 – Study area (Mapping source: ONS, 2022)



2.2.4 The BCKLWN area is the county's third most densely populated built up area, with a population of 154,900 Nomis, 2021. Dating back to the 12th century, King's Lynn has retained its role as an import centre. The historic port has facilities for steel, timber, dry bulk cargo, such as cereals, and liquid bulk cargo, such as petroleum. Retail and tourism are other key industries in the area, with visitors attracted to King's Lynn's historic centre and nearby Sandringham House.

2.2.5 Despite its strengths, the borough of King's Lynn and West Norfolk has a number of challenges that must be addressed for it to meet its full potential. Intensified by the Covid-19 pandemic, King's Lynn's town centre is dominated by vacant units and budget shops, reflecting the spending power of much of the population. Accessibility and inclusivity are key, with disparity in working population, skill levels and opportunity compared with the rest of Norfolk. The borough's transport network has also come under increasing pressure in

recent years, constraining growth and impacting both the environment and individual user experience.

2.2.6 The borough's demographic, economic, and transport context are explored further in the following sections. Drawing on these sections a summary is provided of the key problems facing King's Lynn and the borough, as detailed in Section 2.4.

Population Trends

2.2.7 Population growth in the East of England has accelerated rapidly in the last 10 years, increasing by 8.3% over the period. The region has gained approximately 488,000 people, the biggest rise across England and Wales. 2018 Office of National Statistics (ONS) projections indicate that the East of England will grow by a further 7.8% by 2043. In that time period, the population of King's Lynn and West Norfolk is expected to pass 160,000, an increase of 3.4%.

2.2.8 In particular, the proportion of those aged 65 years and over is forecast by the ONS to increase by 31.8% over the next twenty years, compared with 2018 levels. The working age population (16-64 years) is set to decrease by 5.5% across the same time period, meaning there is likely to be an employment and skills shortage due to a lack of working age residents. This increase in the East of England's population will place further strain on housing and transport infrastructure across the region. Investment in new infrastructure will therefore play an important role in delivering new housing to cope with the increased population demand.

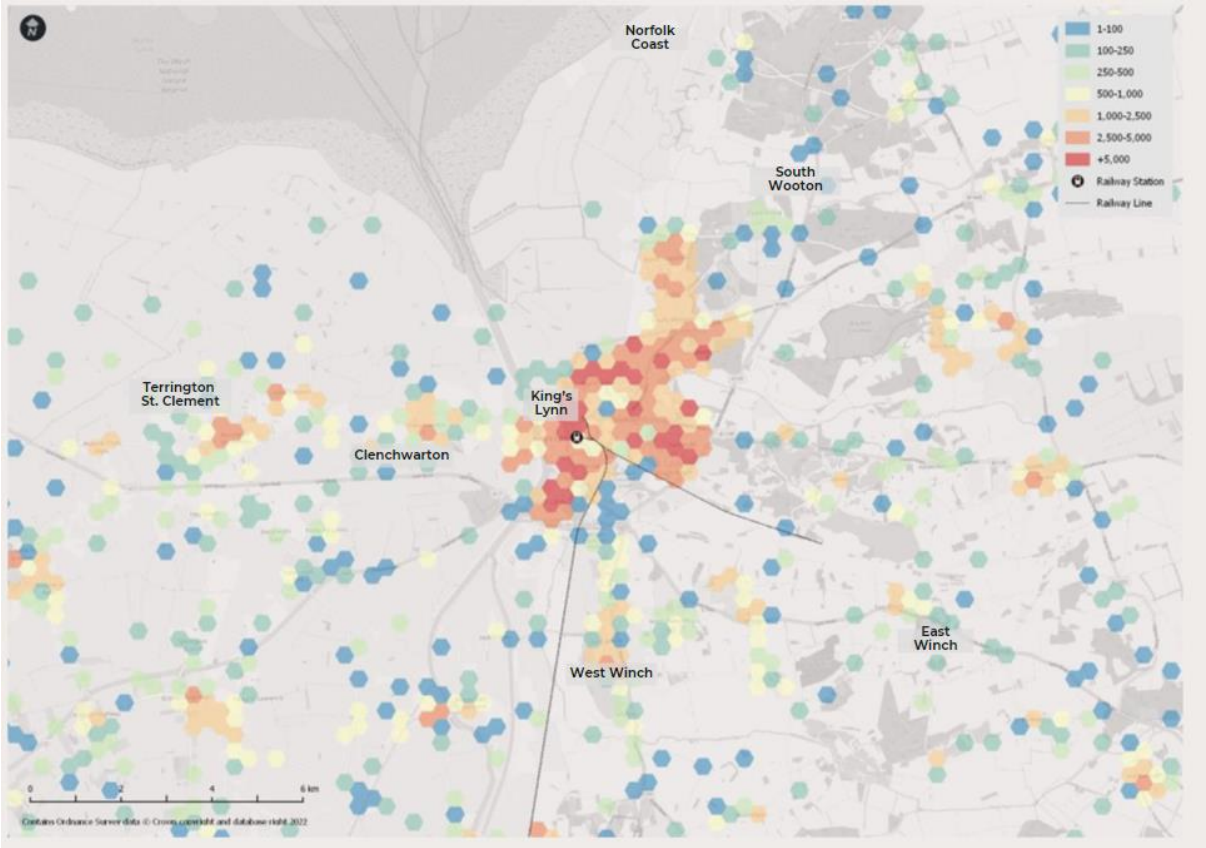
Population Density

2.2.9 Figure 2.2 shows the population density within the study area. In general, the area is made up of predominantly rural settlements, with the largest concentration of residential populations located towards King's Lynn. Despite this, as of 2021, King's Lynn and West Norfolk is the second least densely populated of the East of England's 45 local authority areas, with an area equivalent to around one football pitch per resident ONS, 2021. Population

density is understandably higher in King's Lynn, which is the largest urban settlement in the area.

2.2.10 Significant residential development is expected within the study area over the next decade. Additional detail can be found in Section 2.2.34.

Figure 2.2 – Population Density (Mapping source: ONS, 2022)



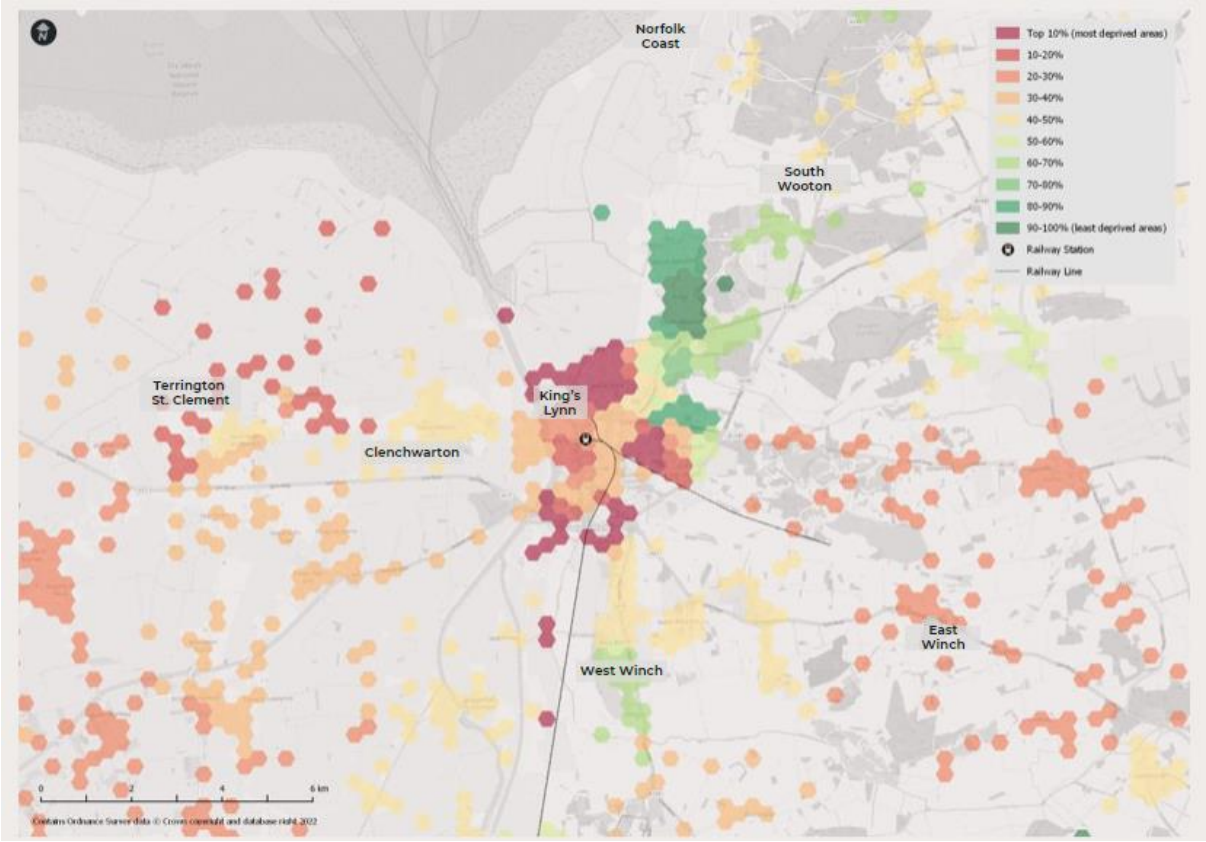
Deprivation & Health

2.2.11 Deprivation is relatively worse in King's Lynn compared with surrounding areas. Of the 89 Lower Layer Super Output Areas (LSOAs) (LSOAs contain a population of between 1,000 and 3,000, or between 400 and 1,200 households. This allows for the comparison of areas of similar size and social characteristics, including Indices of Deprivation) in King's Lynn and West Norfolk, 9 were among the 20% most income-deprived in England, measured against the Indices of Multiple Deprivation (IMD). The IMD includes several factors influencing the level of affluence in an area including income,

employment, education, health, crime, barriers to housing services and the living environment.

2.2.12 Within the study area, communities towards the west, south-west, and north-west of the district, such as Emneth, Upwell, and Hay Green are areas of high deprivation. Communities towards the east and south-east of the study area such as East Winch and Gayton are also areas of relatively high deprivation. These are illustrated in Figure 2.3.

Figure 2.3 - Levels of Deprivation (Mapping source: Indices of Multiple Deprivation, ONS, 2019)



2.2.13 One of the challenges faced by these deprived communities is transport. Poor public transport connectivity was identified within the King's Lynn Town Investment Plan as a barrier to employment for individuals within these areas, with gaps in the local walking, cycling and bus network and an overreliance on private cars a contributing factor. This is explored further in Section 2.5.

Economic Context

2.2.14 The East of England is a prosperous region with a highly skilled workforce, diverse business base, economy, and communities, and is worth £150bn per year, as noted in the Economic Strategy for the East of England 2017. Driven by a world-leading university, specialist, high-value, knowledge intensive services, and rich cultural heritage, the area is one of the fastest-growing regional economies in the UK. The region's success is supported by Norfolk, with an economy worth £36bn and 81% of the working aged population engaged in the economy. Offshore wind energy, cyber security, research and development, as well as the agri-food sector are some of the most successful industries in Norfolk.

2.2.15 GVA per hour worked in East Anglia, an area in the East of England that includes the counties of Norfolk, Suffolk and Cambridgeshire, is slightly below the UK average at £32.27 compared to the UK average of £37.70, as identified in the Sub regional productivity: labour productivity indices by economic enterprise region dataset, 2020, ONS. This accounts for those who are economically actively employed, including those who commute into the area. From 2008 to 2019, GVA per hour has grown by 21.8%, marginally slower than the UK average of 22.9%. According to EY UK's latest Regional Economic Forecast Report 2022, the East of England's GVA is set to grow 2.8% per year to 2025, in line with the national average.

2.2.16 There are, however, marked variations regarding employment rates between different parts of the region. Of the seven districts that comprise Norfolk, King's Lynn and West Norfolk has the third highest unemployment rate at 2.9% in 2022. The borough has a higher than average proportion of young people with no qualifications (6.7% compared with 6.6% for England), leading to a disparity in skills levels and knowledge. Consequently, BCKLWN has experienced a downward trend in GDP growth at -4% in 2019. A lack of integrated investment in the borough has contributed towards poor growth levels.

2.2.17 As part of the New Anglia Local Enterprise Partnership (LEP) for Norfolk and Suffolk, key ambitions for education institutions and wider work inspiration programmes are being prioritised to support the future workforce within the region. This will address the current and future skills needs of businesses whilst focusing on growth, sustainability, and inclusion.

2.2.18 The demand for highly skilled workers is growing, as outlined in the Norfolk and Suffolk Local Skills Improvement Plan 2023. The National Strategic Skills Audit, published by the UK Commission for Employment and Skills, concluded that the East of England is well placed to benefit from growth sectors such as low carbon technology, advanced manufacturing, and life sciences. However, businesses in Norfolk have reported difficulty in recruiting people with the right skills, particularly in the energy sector.

2.2.19 High-quality infrastructure is important for economic growth as it boosts productivity and competitiveness by connecting businesses and people together. Well-developed transport and infrastructure networks allow businesses to grow and expand through benefits such as extending supply chains and deepening labour and product markets, according to the National Infrastructure Strategy 2020. These benefits can be particularly prevalent in urban centres, such as King's Lynn, where agglomeration can enhance benefits.

The Impact of Coronavirus

2.2.20 The coronavirus pandemic had a significant impact on Norfolk's economy with many industries struggling, particularly the tourism and hospitality sectors. The extent of this is shown by the sharp fall in GVA. In summer 2021, it was reported by NCC that GVA dropped by £4.5 billion in 2020, to £15.2 billion. Approximately 22% of Norfolk and Suffolk's employees were furloughed, with a total of almost 95,000 people claiming universal credit at the height of the pandemic, according to the 2020 Covid-19 Economic Recovery Restart Plan prepared by New Anglia LEP.

2.2.21 Post-pandemic, NCC has developed an ambitious programme of measures to build back better, greener, and stronger. The five-year restart plan sets out the actions and interventions for a wide range of partners including New Anglia LEP, local authorities, businesses, industry councils, colleges, and universities to aid economic recovery. Key measures include advice and support for businesses, a campaign to promote tourism, as well as support for young people to access education, employment, and training. Priority has also been given to key infrastructure projects in Norfolk, providing much needed jobs and an economic boost.

2.2.22 The National Infrastructure Strategy 2020 notes that infrastructure investment is expected to play a key role in recovering from the coronavirus pandemic by creating conditions for long-term sustainable growth.

Cost of Living

2.2.23 The cost of living in the East of England is high and has increased significantly in recent years, with house prices in Norfolk rising at their fastest rate in almost two decades. Over the period June 2020 – June 2021, the average house price in the UK increased by 13.2%. This is the highest national annual growth since November 2004. King's Lynn and West Norfolk experienced above average housing price increase over the same period, with prices rising from £221,878 to £253,688, an increase of 14.3%.

2.2.24 In terms of rent, average rent prices in the East of England were the third highest over the period 2021 to 2022 at £865, surpassed only by London and the South East.

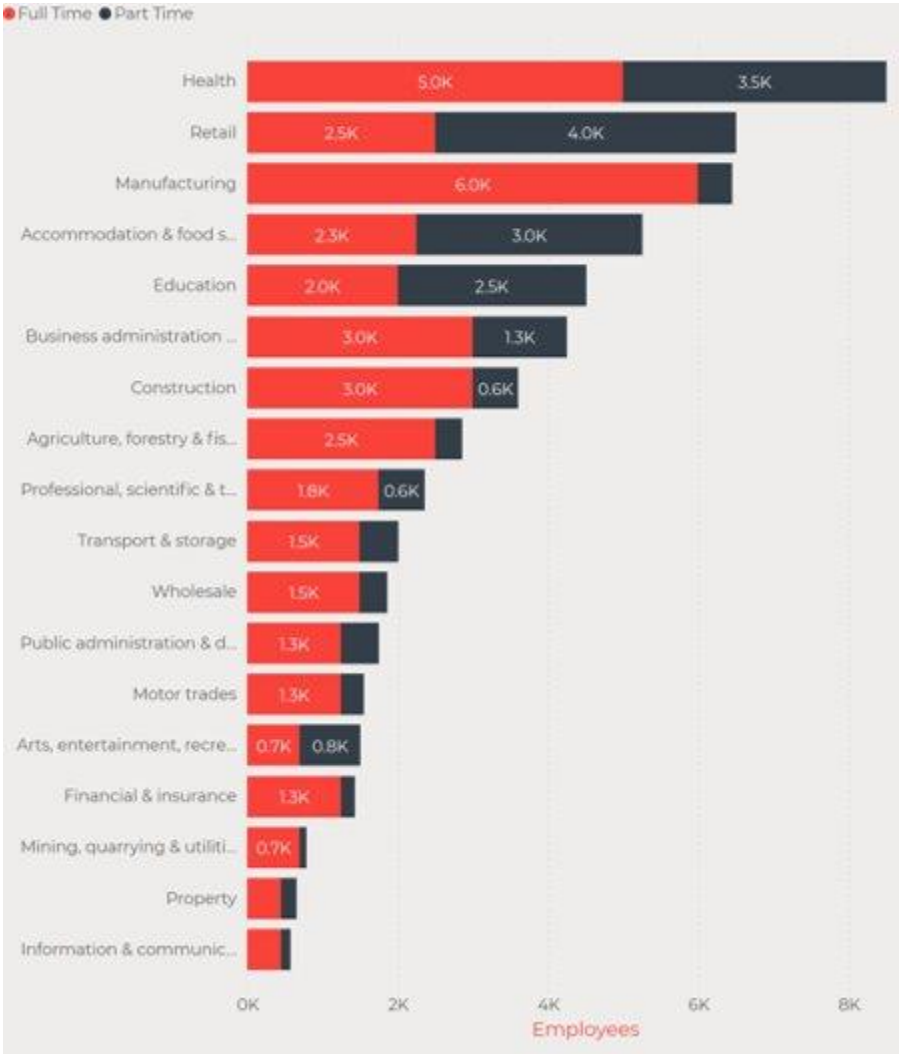
2.2.25 In the context of the projected population increase the housing affordability and rent spend challenges will put further pressure on housing supply in the East of England, demonstrating that not only more housing is needed, but also more affordable housing. The West Winch Growth Area will deliver 4,000 new homes to meet housing need, of which 20% will be affordable housing. Without investment in supporting infrastructure this is unlikely to be delivered at the required level.

2.2.26 The rising price of fuel will impact lower-income car owners, young drivers, and rural residents forced to drive much higher mileages than most. Those worst affected by the rising cost of living may have to sell their vehicle and not replace it as a result, resulting in a loss of access to services and opportunities, and reliance on public transport and active modes, according to a poll by AA in 2022.

Key Employment Areas

2.2.27 There are approximately 62,000 jobs in West Norfolk, of which 55% are located in King's Lynn, acting as the principal economic driver for the borough, as noted in the 2019 King's Lynn Transport Strategy. Key employment sites are located to the north and south of King's Lynn, with a variety of employment across a number of different sectors, as outlined in Figure 2.4.

Figure 2.4 - Employees by Industry and Type (Mapping source: NOMIS, 2020)



2.2.28 The Queen Elizabeth Hospital, located on the eastern edge of the town, is an anchor institution for the town and regional healthcare cluster. A key employer in the area, the hospital has over 3,000 staff and 515 beds. However, a lack of local nurse training has led to persistent nurse vacancies at the hospital, with high turnover and resource spent on recruiting from overseas. This contributes to the local skills shortage, as noted in Section 2.2.16.

2.2.29 Retail and employment opportunities in King's Lynn are concentrated both centrally and towards the southern edge of the town, particularly in the Hardwick area close to the A149 / A147 junction. King's Lynn is the major centre for retail within the borough, employing 2,500 full time staff. The

Vancouver Quarter dominates the town centre and is home to a number of high-street retail stores.

2.2.30 King's Lynn is also a major centre of education, employing a combined total of 5,300 full and part-time staff across a number of educational institutions, such as:

- King Edward VII Academy
- King's Lynn Academy
- Springwood High School
- St Michael's Primary School
- The College of West Anglia (King's Lynn Campus is located to the east of the town centre).

2.2.31 In addition to the core employment areas in King's Lynn, a number of development sites have been identified in the Local Plan which will support new opportunities for skills and jobs in the area. Following a £60 million public infrastructure project, the Nar Ouse Regeneration Area has transformed brownfield land to the south of King's Lynn into an innovative Enterprise Zone. Close to the Hardwick Retail Park and West Winch Growth Area, the Enterprise Zone is home to King's Lynn's major industries, including manufacturing, pharmaceuticals, engineering, and logistics. As a result of the Enterprise Zone, 167 full time jobs have been created, with the potential for more as the site continues to develop, according to the 2020 King's Lynn Town Investment Plan.

2.2.32 As set out in the BCKLWN Site Allocation Plan, new employment allocations are needed to provide job opportunities for residents in and around King's Lynn to support the growth aspirations for the town. To achieve this objective, the West Winch Growth Area will provide approximately 50 hectares of new employment land. The growth area will generate employment not only during the construction phase but in servicing the new community (e.g., through property maintenance and small businesses).

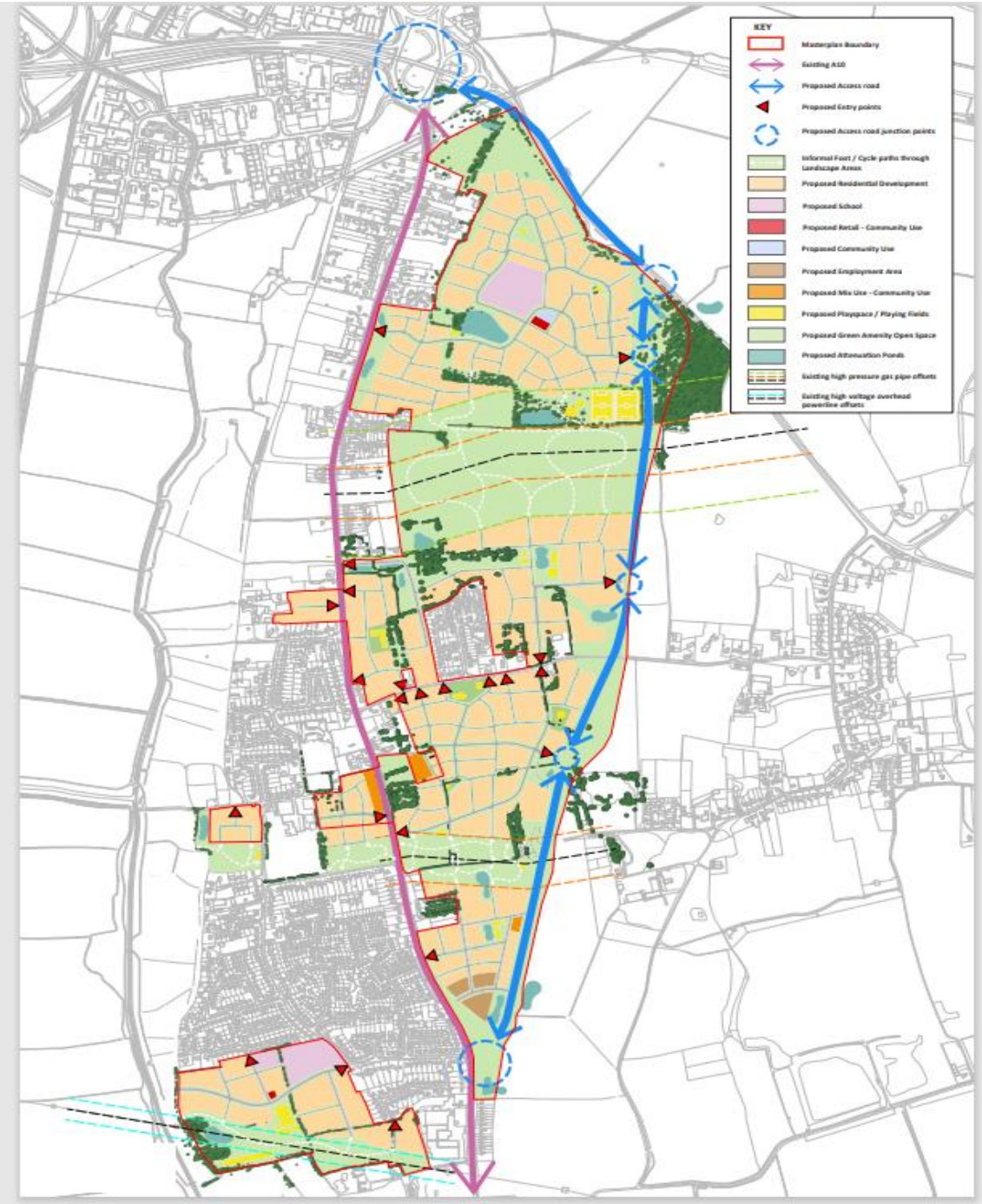
Housing Development Sites

2.2.33 As noted in Section 2.2.7, population growth, and therefore housing availability, is a critical issue in the region.

2.2.34 The King's Lynn and West Norfolk Core Strategy suggests a need for approximately 16,500 new dwellings across the borough over the period 2001 to 2026. During this time period, there is provision for at least 7,510 dwellings in King's Lynn through developments at strategic locations identified in the borough's Site Allocation Plan. At least 1,000 of these dwellings will be provided as part of the regeneration of the central part of the town and the remaining number will be allocated within urban expansion areas to the north and southeast of King's Lynn. Since 2010, 1,718 new homes have been delivered in King's Lynn, contributing to the target set out in the Core Strategy.

2.2.35 West Winch has been allocated within the Local Plan as a Strategic Growth Area, a key site covering 192 hectares southeast of King's Lynn which includes the parishes of West Winch and North Runcton. Within the Growth Area, three local neighbourhood centres are planned, each giving a focus to a neighbourhood area. The first would be a new centre in the northern section and the two remaining centres would be delivered through enhancements to existing centres of West Winch. The intention of the three centred approach is to create a sustainable layout that would enable residents to walk and cycle to local amenities, facilitating the development of neighbourhood identity. The delivery of the site will bring economic benefits for the whole of the borough, offering employment opportunities, commercial space, community resources, public open space, as well as health and education facilities, as identified in Figure 2.5.

Figure 2.5 – West Winch growth area site



2.2.36 It is envisaged that the West Winch Growth Area will deliver 2,500 new homes in the Local Plan period to 2038 and up to 4,000 new homes in the fullness of time. The proposed WWHAR scheme will serve the 4,000 new homes in the growth area, ensuring traffic from the new development has a minimal impact on the existing A10 as it passes through the village. The access road will also

address existing traffic problems on the A10 by providing an alternative route around the village that conforms to Major Road Network (MRM) standards.

2.2.37 The addition of new homes will meet a need for King's Lynn and West Norfolk, but it is also recognised that the number of targeted additional dwellings will add pressure to the existing transport network, both during and after construction. Addressing those transport challenges now is expected to enable both the delivery of various housing sites and future population growth.

Transport Context

2.2.38 Transport infrastructure is one of the key challenges in King's Lynn and West Norfolk. There is a high dependency on private car in King's Lynn, particularly within its large rural hinterland, with driving the most common primary mode of transport to work at 69%. Congestion is consequently a key issue throughout the town, particularly at junctions along the A149, in the town centre and around the Southgates roundabout. The challenges of congestion are summarised in Section 2.4.

2.2.39 King's Lynn is linked to the cities of Norwich and Peterborough by the A47, to Cambridge by the A10, and to Spalding and the North via the A17. West Winch is situated on the A10 2.5 miles south of King's Lynn.

2.2.40 The following sections set out the transport context for King's Lynn and West Norfolk, and evidence some of the key transport challenges faced by the borough. These challenges are summarised in Section 2.4.

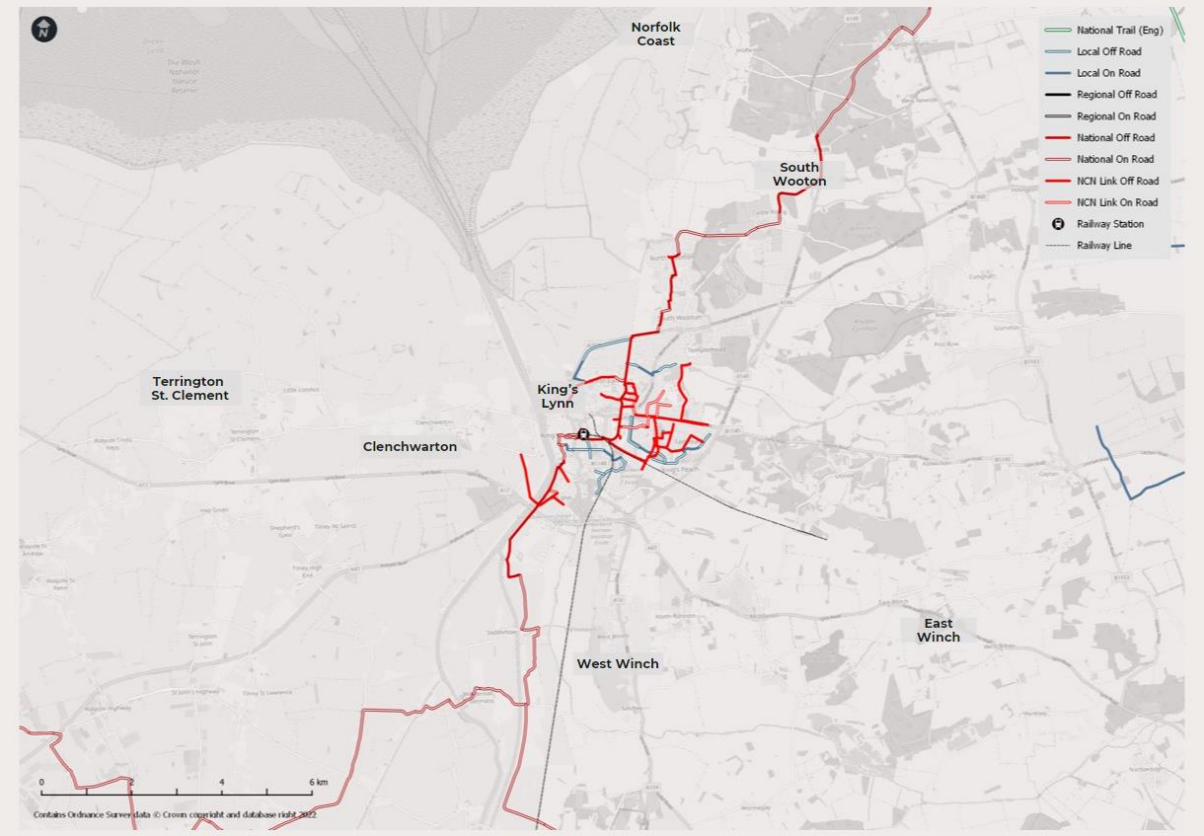
Active Travel

2.2.41 The East of England's authorities have a strong track record of successfully delivering walking and cycling schemes. NCC have been awarded significant investment for local infrastructure projects that support the promotion of walking and cycling as an attractive and convenient transport mode for shorter journeys. The area will benefit from the Government's £3.6 billion Towns Fund which will deliver 1.5km of new cycleways and over 5.5km of pedestrian path improvements in King's Lynn.

2.2.42 The Sustrans National Cycle Network runs throughout Norfolk and the wider region, providing extensive maintained and accessible active travel infrastructure. Route 1 of the National Cycle Network runs from Dover to the north of Scotland, passing through King's Lynn towards the scenic Norfolk coastline. The key national and regional routes are supplemented by a network of secondary neighbourhood routes which serve to increase accessibility and connectivity across the whole King's Lynn area.

2.2.43 Cycling and walking are popular for short journeys in King's Lynn, with 17% of journeys to work made using active travel modes compared with 8% for England. Residents in King's Lynn take advantage of 62km of on-road local active travel routes, as illustrated in Figure 2.6. Outside of the urban centre of King's Lynn, there is good cycle provision, particularly to the north of King's Lynn towards South Wooton. There is provision throughout West Winch, with a 5.3km route connecting The Walks Park in King's Lynn to West Winch. The route predominantly follows a shared-use path often with no cycle provision in places, leaving users at risk on roads with high volumes of traffic.

Figure 2.6 – Active Travel Routes in King's Lynn and West Winch (Mapping Source: National Cycle Network, Sustrans, 2022)



2.2.44 The King's Lynn Local Cycling and Walking Infrastructure Plan (LCWIP) responds to the lack of connectivity in the area and identifies a number of priority active travel network improvement schemes. These schemes aim to connect key transport, shopping, education, health, and commercial locations within the town and with nearby parishes. One of the proposed improvement schemes aims to upgrade the existing 5.3km walking and cycling route from King's Lynn bus station to West Winch. This will serve the large employment sites of Hardwick Industrial Estate, Campbell's Meadow Retail Park, and Hardwick Narrows Industrial Estate. Ambitions for greater increases in walking and cycling are also part of NCC's LTP4, which further emphasises the need for additional active travel links in King's Lynn.

2.2.45 The West Winch Growth Area includes the provision of a network of cycle and pedestrian routes, including links to King's Lynn town centre. The sustainable layout of the site would enable residents, both new and existing, to walk or

cycle to work or school. There is potential to enhance and develop linear green corridors or links through the growth area, making connections within the new development, neighbouring communities and the open countryside.

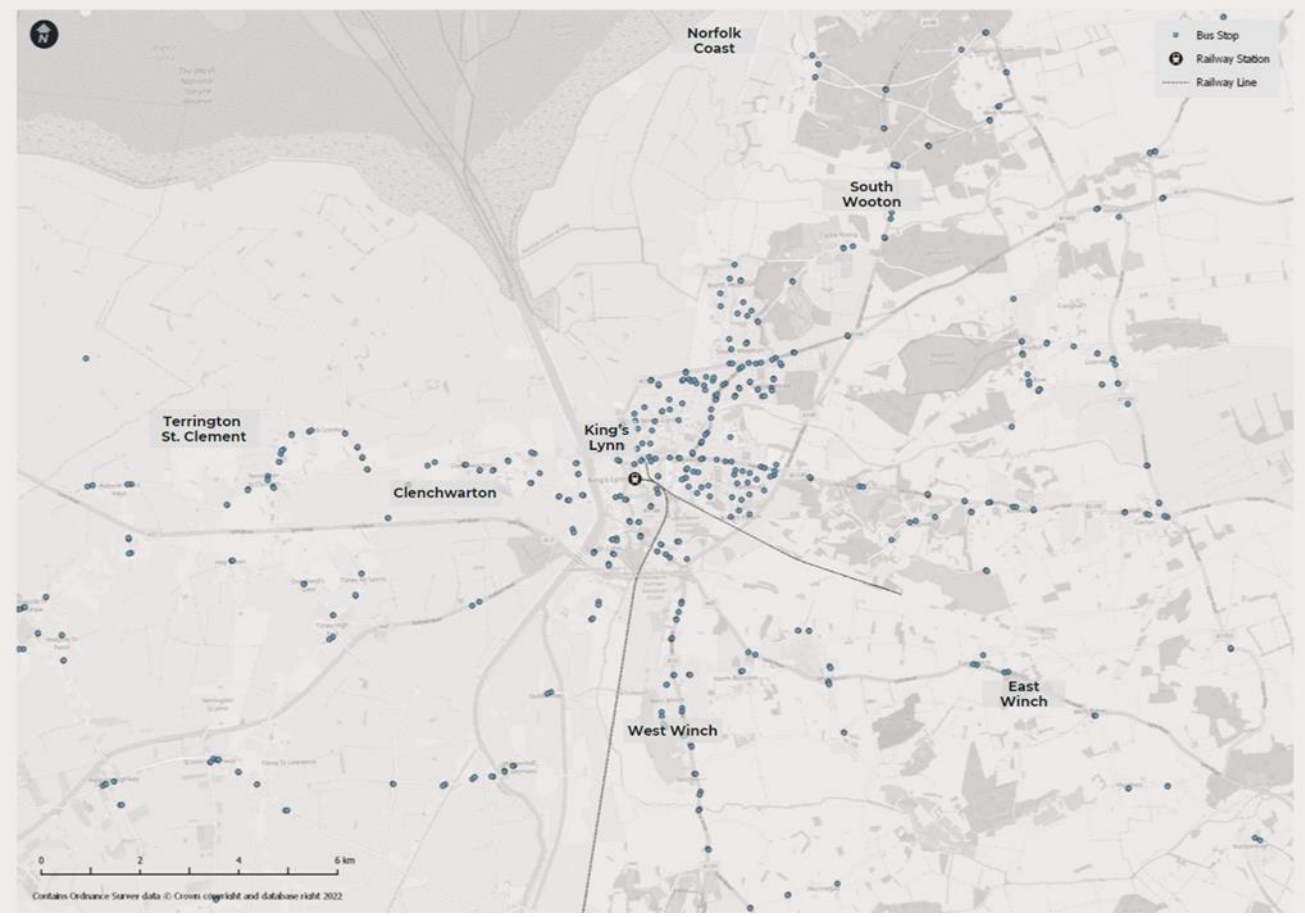
Public Transport

2.2.46 Analysis as part of NCC's Rural Economic Strategy revealed that two-thirds of those from Norfolk's rural areas are living in 'transport deserts', with no alternative but to rely on private vehicles. Consequently, according to the 2021 Norfolk Rural Industrial Strategy, in 2019, 15% more miles were travelled on Norfolk roads compared to 2012 levels. This can be attributed to poor public transport infrastructure within the borough, particularly in more rural areas such as Tottenhill Row, Thorpland, and along the West Norfolk coastline.

Bus Services

2.2.47 Figure 2.7 shows the provision of bus stops within the local area, consisting of 1,015 existing bus stops. As seen in Figure 2.7, bus stops are concentrated near the key urban centre of King's Lynn, becoming infrequent further away from the town centre. There are 23 bus stops that serve the village of West Winch, located predominantly on roads adjacent to the A10 (West Winch Road), such as Mill Lane, Rectory Lane, Gravelhill Lane, and Chequers Lane. Bus services throughout the borough are provided by multiple operators, ranging from the local Lynx Bus service to Norfolk's largest provider, Stagecoach Bus.

Figure 2.7 - Public Transport Infrastructure (Mapping source: naptan.dft.gov.uk)



2.2.48 The main bus station in King's Lynn is situated off Market Street at a central location for the town and serves the surrounding villages, towns, and rural areas. It is located in close proximity to the rail station which provides connections with Cambridge and London and establishes the centre of King's Lynn as a public transport hub. There is provision for public transport to route through the West Winch Growth Area, providing connectivity to King's Lynn.

2.2.49 Much of the urban area of King's Lynn is located within an accessible distance to a bus route. However, bus service frequencies vary across the town with a high concentration of bus services on Gaywood Road (A148) and also the Queen Elizabeth Hospital. Most residential areas have at least 3 buses per hour including North Wootton. South Wootton has a lower bus service frequency overall at 1 to 2 buses per hour, as identified in the 2018 King's

Lynn Transport Study and Strategy. The villages outside King's Lynn have a relatively poor level of service which means the buses are unattractive to use because of their limited times and/or days of operation.

2.2.50 Despite serving as a regional transport hub with a large bus station, there are consistently low levels of bus use in King's Lynn. All bus services in King's Lynn have to travel through the central gyratory in the town centre, which is subject to peak time congestion and delays, resulting in poor bus journey time reliability.

Railway Services

2.2.51 Figure 2.8 shows the existing railway network within the borough, which is served by Great Northern, with some additional peak services being operated by Greater Anglia. The station links King's Lynn to Ely in 30 minutes, Cambridge in 50 minutes, and London in 110 minutes.

2.2.52 The Monday to Friday services between King's Lynn and London King's Cross increase during peak travel times to provide a service approximately every 30 minutes:

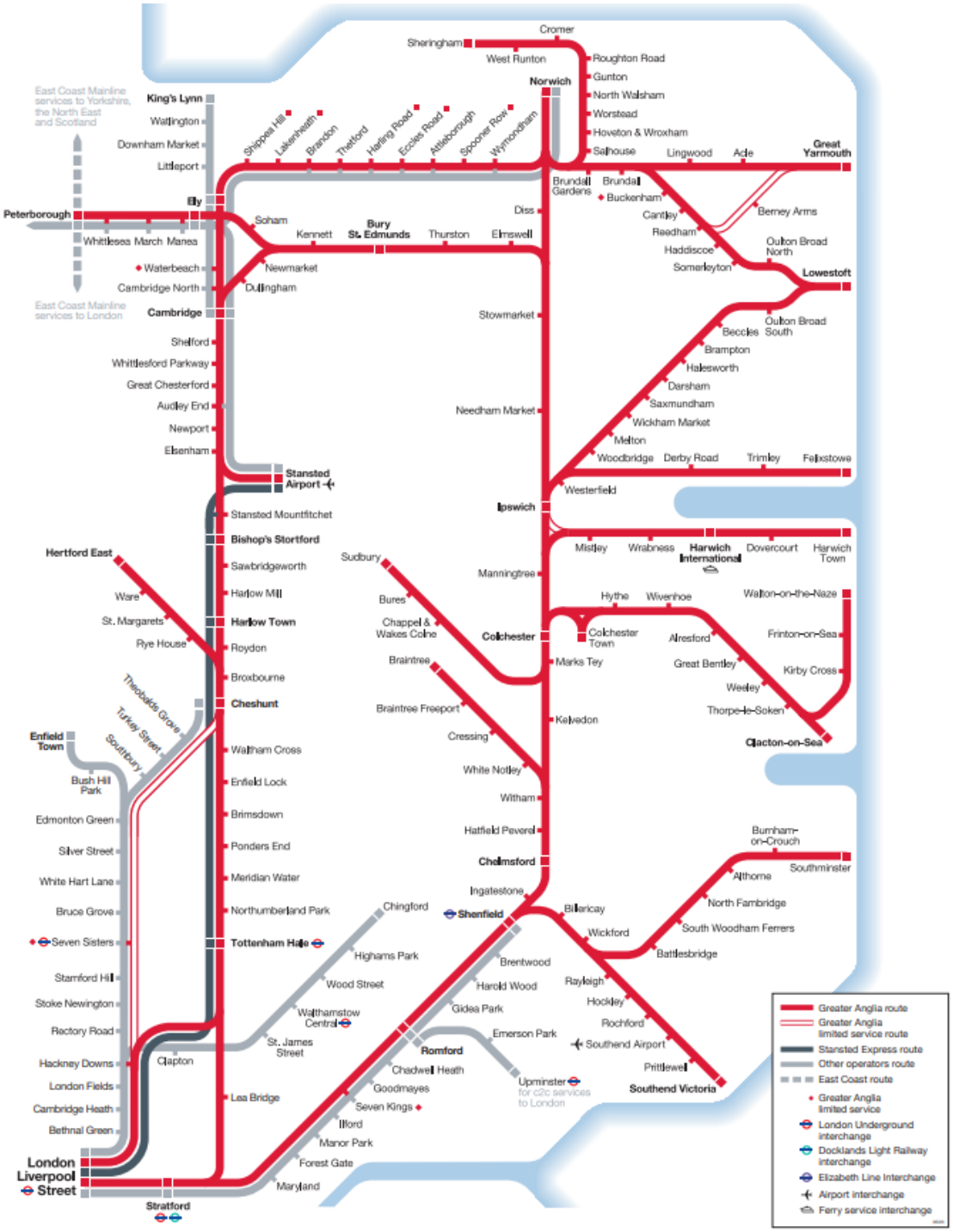
King's Lynn – London King's Cross (Monday-Friday)

- AM peak: 4 additional trains, at 06:10, 07:18, 08:12 and 09:10
- PM peak: 1 additional train, at 17:16

London King's Cross – King's Lynn (Monday-Friday)

- AM peak: 1 additional train, at 07:16
- PM peak: 2 additional trains, at 18:12 and 20:12

Figure 2.8 – Railway network



2.2.53 The closest railway station to West Winch is 3.1 miles away in King's Lynn, accessible by a 12-minute car journey or 10-minute bus journey, due to bus priority. The station is accessed by vehicle from Blackfriars Road where the station car park provides 134 spaces, as well as 11 accessible spaces. This is relatively poor parking provision considering the town's position as a sub-

regional hub. As such, travellers typically use the St. James multi-story car park, which is 0.4 miles from the station, adding approximately 10 minutes onto traveller journeys. Bus services are available outside the station, as well as 104 cycle storage spaces and a taxi rank.

2.2.54 Watlington station is also used by residents in West Winch. Although it is 4.5 miles away from the village, it is only a 9-minute journey by car and avoids the urban traffic associated with King's Lynn town centre.

2.2.55 In terms of future provision, the single-track sections between Ely and King's Lynn restrict the frequency of services that can be provided for the town. There is an aspiration to upgrade the line to two-track between King's Lynn and Ely to accommodate 12-car trains and provide a less restricted rail service frequency.

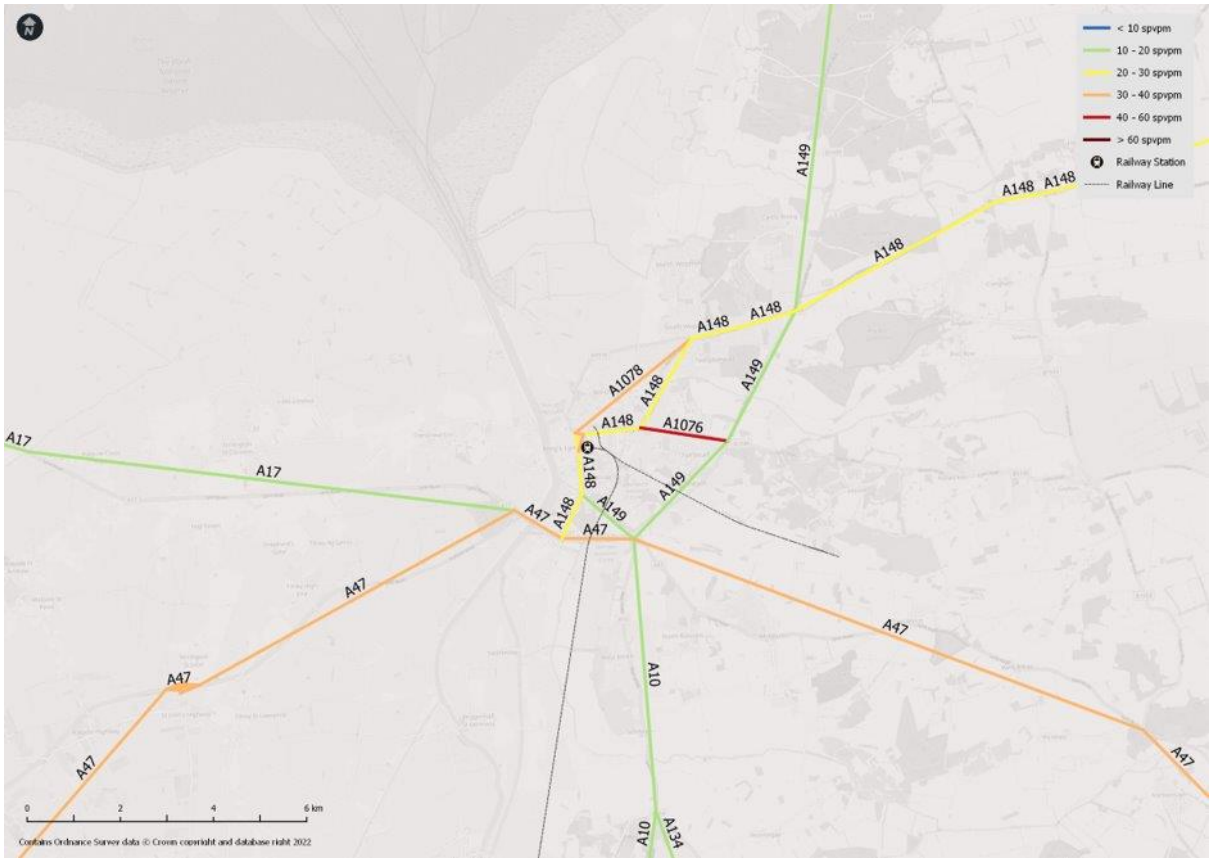
2.2.56 In January 2023, at a meeting of the borough council's regeneration and development panel, it was decided that plans for a new railway station to serve the 4,000 new homes planned at West Winch would not be progressed. The proposal was deemed too costly and is out of scope of the West Winch Strategic Growth Area masterplan.

Congestion & Delays

2.2.57 Speed, delay, and reliability statistics produced by the DfT show that the average vehicle delay on local (non-SRN) A-roads in the UK between 2017 and 2019 was 25 seconds per vehicle per mile and the average speed was 46 miles per hour.

2.2.58 Within the borough, the average delay on A-roads is 24.5 seconds per vehicle mile – in line with the UK average. The delay in King's Lynn in the AM and PM peak is shown in Figure 2.9.

Figure 2.9 - Average Delay on A-roads (Mapping source: Nomis, Census 2021)



2.2.59 The highest average delays are experienced on the A1076 and A1078, with consistent delays of 58.6 seconds and 39.5 seconds of delay per vehicle mile, respectively.

2.2.60 A high-level assessment of traffic congestion at peak hours was undertaken as part of the King's Lynn Transport Study. The following locations were identified as congestion hotspots during morning and evening peak hours (08.00-09.00 and 17.00-18.00):

- Town centre gyratory
- Valingers Road / London Road traffic lights
- Southgate inbound from Southgates roundabout
- Vancouver Avenue onto Southgates roundabout
- A149 bypass (three roundabouts): Hardwick Road (A149); Gayton Road (A1076); Grimston Road (A148)

- Tennyson Avenue / Gaywood Road
- Loke Road / Gaywood Road
- Gaywood Clock (Lynn Road / Wootton Road) including junction with Queen Mary Road
- Queensway junction with A1076 especially right turn off A1076 into Queensway
- A1076 Gayton Road mini roundabout Winston Churchill Drive and QE hospital
- Loke Road / John Kennedy Road junction
- Estuary Road / Edward Benefer Way
- Low Road / Castle Rising Road / Wootton Road / Grimston Road cross roads

2.2.61 Commuting trips to and from King's Lynn town centre are impacted by the AM and PM congestion hotspots, contributing to poor bus service journey time reliability. In turn, poor network resilience constrains productivity and economic growth in King's Lynn.

2.2.62 Due to the restricted nature of the highway network within King's Lynn and the limited alternative routes available, when incidents occur, either within the town or on the strategic network (A47 and A149), traffic congestion levels can be very limiting for the town. In addition to when incidents occur, congestion worsens during seasonal peaks as traffic diverts off the busy A47/A149 to alternative, less busy routes through King's Lynn.

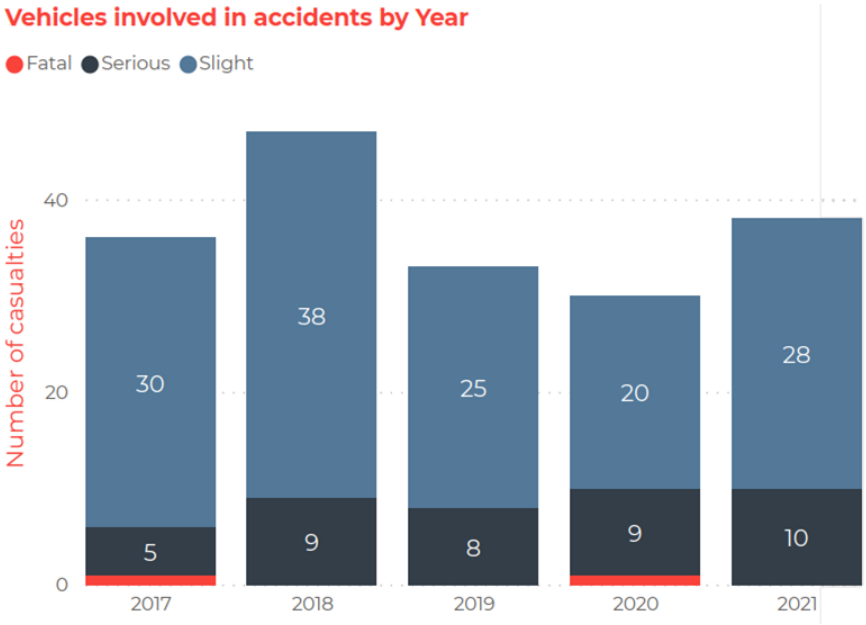
Road Safety & Accidents

2.2.63 Figure 2.11 shows the location of killed or seriously injured (KSI) casualties within the borough in 2022, using DfT collision data. There is a concentration of collisions in the town centre of King's Lynn, where the road network is dense and the potential for vehicle/vehicle and vehicle/pedestrian collisions is high.

2.2.64 There is a further concentration of collisions along heavily trafficked A-roads, including the A10, A47, A149, and A148. As discussed previously, the high levels of congestion on these routes affects the impact of incidents and network resilience. There are fewer collisions in more rural areas of the borough.

2.2.65 As shown in Figure 2.10, the number of serious vehicle accidents involving pedestrians and cyclists in King's Lynn and West Winch has been increasing since 2017, with 10 serious casualties in 2021.

Figure 2.10 - Accidents Involving Cyclists and Pedestrians in King's Lynn and West Winch (Figure source: Road Traffic Statistics, DfT, 2017-2022)



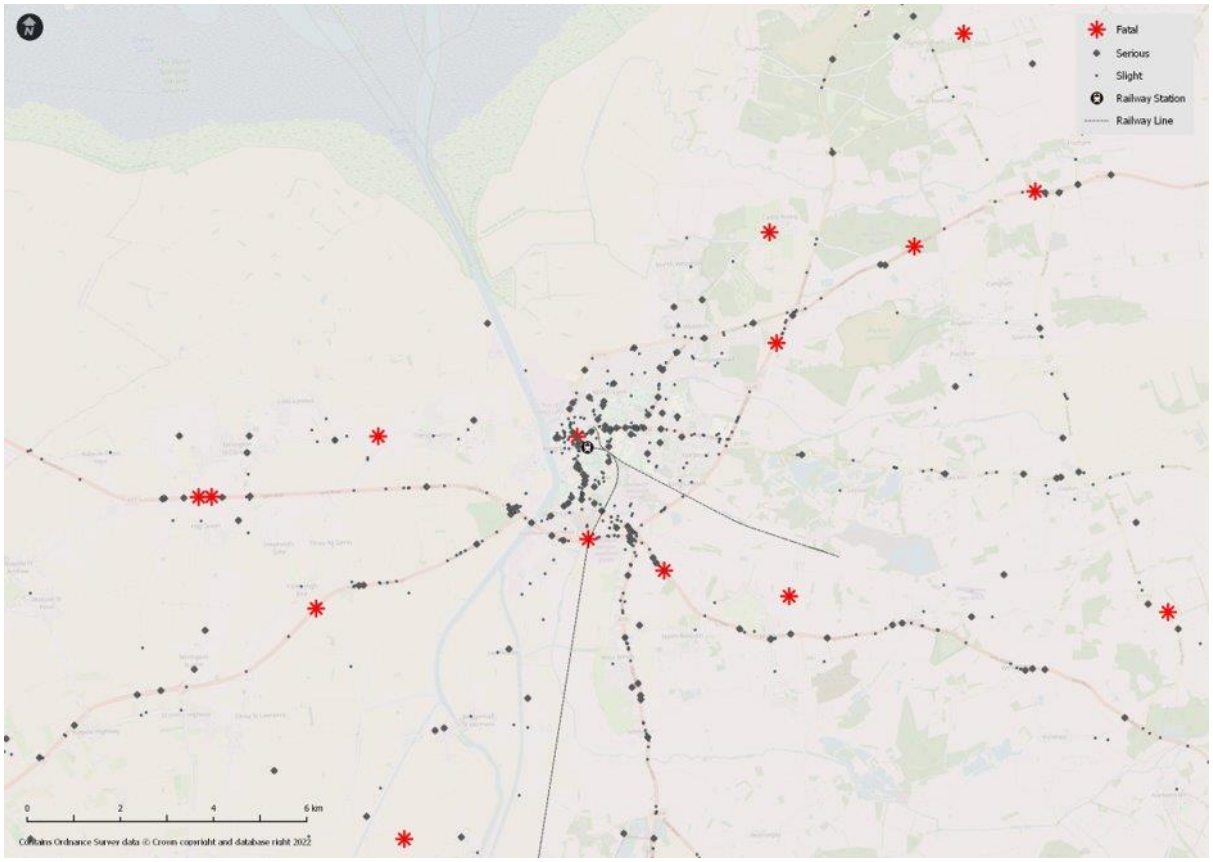
2.2.66 For the accident clusters involving pedestrians and cyclists, the following locations have been identified in the King's Lynn Transport Study as the areas in need of road safety mitigation measures:

- Railway Road
- London Road / Valingers Road / Windsor Road
- Southgate
- Tennyson Avenue / Lynn Road
- Southgate junction

2.2.67 For all modes the main areas are:

- Hardwick Road
- A47 / A149 at Hardwick
- A149 Hardwick Industrial Estate

Figure 2.11 - KSI Accidents Invloving All Types of Vehicles (Mapping source: Road Traffic Statistics, DfT, 2022)



Travel Patterns

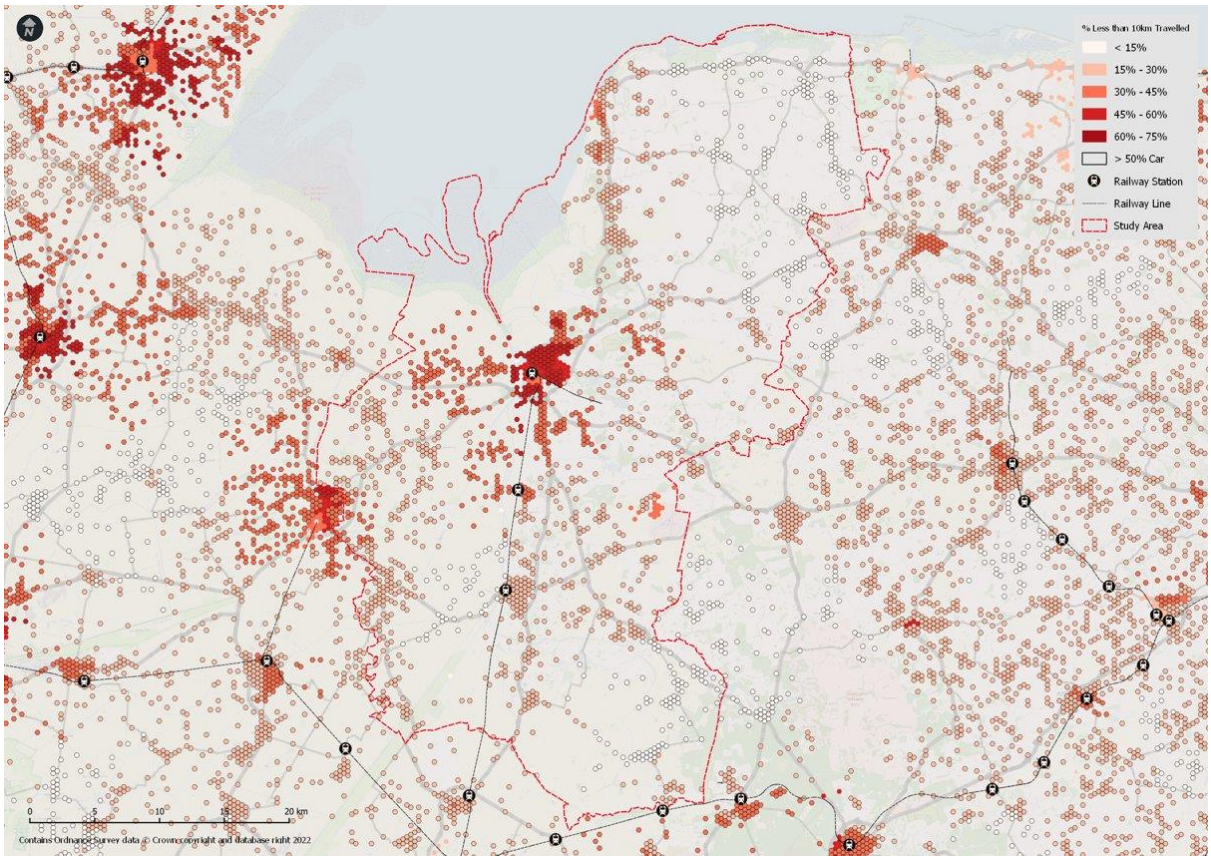
2.2.68 2021 Census Origin and Destination (OD) datasets provide the location of usual residence and place of work.

2.2.69 Approximately 17% of people in King's Lynn travel less than 2km to work. Figure 2.12 shows a cluster of shorter distance commuting trips towards the centre of King's Lynn. 16.8% of people travel between 10km and 20km to work, with people travelling longer distances in locations away from King's Lynn town centre.

2.2.70 Mode share by active modes is high, with 4.8% and 9.6% of people choosing to cycle and walk to work, respectively. This is significantly above the national average of 8% for both walking and cycling trips to work. Bus usage for journeys to work is low in King's Lynn at 2.3% compared to the national average of 7%.

2.2.71 Considering that the King's Lynn area will provide approximately 50 hectares of employment land, it is anticipated that residents within West Winch will travel to and from the job opportunities generated[1]. Currently, a low proportion of residents travel outside of the borough to work elsewhere, according to the 2011 BCKLWN Core Strategy Adopted Version. This can be attributed to poor transport connectivity to the regional economic centres of Norwich and Cambridge.

Figure 2.12 - Less than 10km Distance Travelled to Work (Mapping source: Nomis, Census 2021)



Environmental Context

The Climate Emergency

2.2.72 At a national level, transport is the largest contributor to the UK's domestic greenhouse gas (GHG) emissions, responsible for 27% in 2019. The case is the same in Norfolk, with transport responsible for 40% of emissions in the county.

2.2.73 In recognition of the need for urgent action to address the challenge of climate change, and that transport-related emissions had only fallen by 1.2% in King's Lynn and West Norfolk since 2005, a 'Climate Emergency' was declared by the Borough Council in summer 2021. In doing so, a commitment was made and captured in the *BCKLWN Climate Strategy and Action Plan* to work towards delivering net zero carbon by 2035, 15 years in advance of central government targets. A review of the strategy is currently ongoing as to whether the target could be brought forward to 2030.

2.2.74 NCC's fourth Local Transport Plan (LTP4), adopted in 2022, sets the strategic direction for the county's transport network up to 2036. It states that the 'priority for reducing emissions will be to support a shift to more sustainable modes and more efficient vehicles, including lower carbon technology and cleaner fuels', emphasising the need for the facilitation of necessary infrastructure.

2.2.75 To meet the demands of net zero by 2030, behaviour change is vital. NCC recognise the need to facilitate and encourage changes in how people move about the transport network. As such, the advent of a 'behaviour change programme', a targeted marketing campaign aimed at getting people back on public transport, will engender better health, reduced carbon, and improved air quality.

Air Quality Management Areas

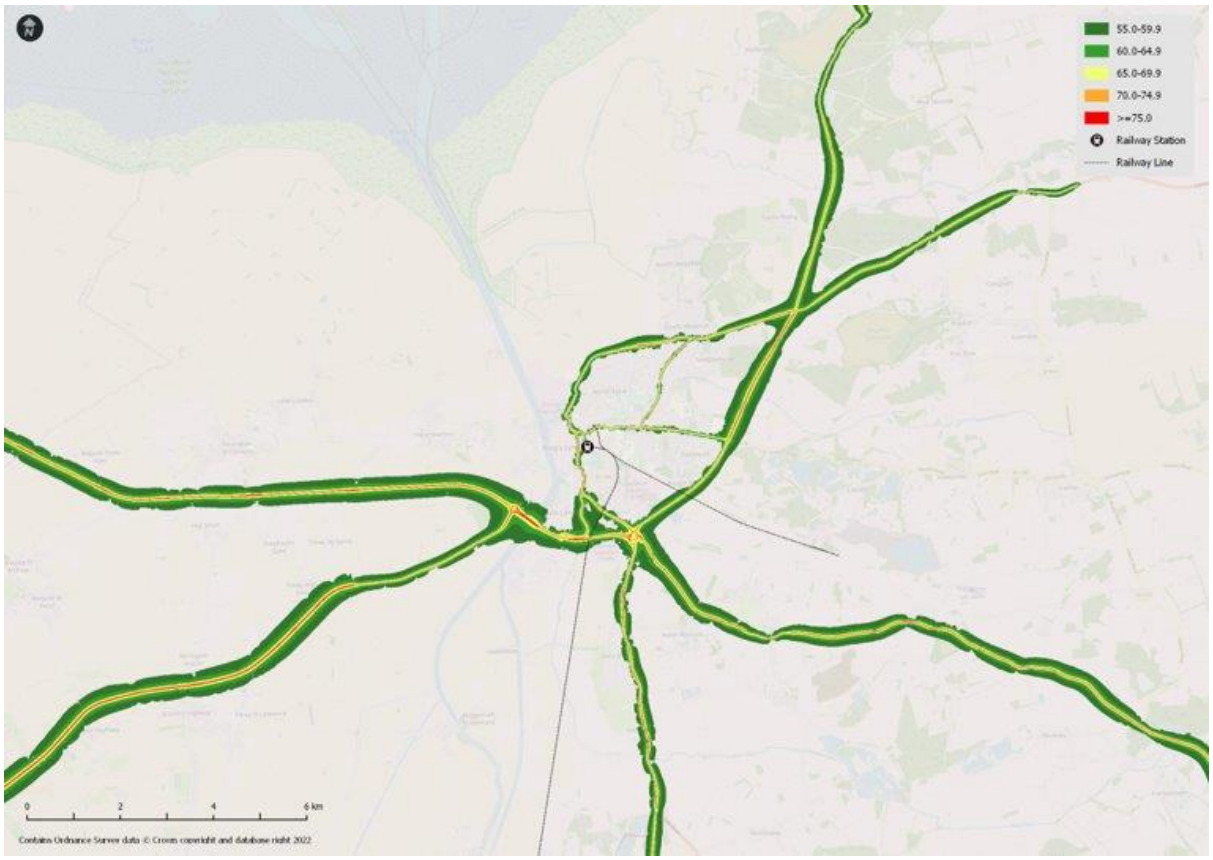
2.2.76 The scheme is not located within any Air Quality Management Areas (AQMAs). The nearest AQMA is located approximately 1.4km north west in King's Lynn.

Noise Important Areas

2.2.77 The Noise Important Areas (NIAs) are shown Figure 2.13. The areas exposed to the highest levels of noise within the borough, are:

- NIAs concentrated towards King's Lynn town centre, associated largely with traffic on the A148 (London Road)
- NIAs concentrated near Fairstead Community Primary School, located near busy A-roads such as the A149 and A1076
- NIAs concentrated along the A10 towards King's Lynn
- NIAs concentrated at Hardwick Interchange

Figure 2.13 - Noise Important Areas – Based on Road Noise (Mapping source: Strategic Noise Mapping, gov.uk)



2.3 Policy Context and Business Strategy

2.3.1 This section describes NCC's strategic aims and responsibilities and sets out the policy context in which the scheme has been developed. It considers the relevant legislation, policy, plans and strategies at a national, regional and local level, to identify the key themes and priorities. The proposed WWHAR scheme is closely aligned with the following national, regional and local transport plans, policies and strategies:

National

- Decarbonising Transport: A Better, Greener Britain (DfT, 2021)
- Build Back Better: Our Plan for Growth (HM Treasury, 2021)
- Bus Back Better: National Bus Strategy for England (DfT, 2021)
- Net Zero Strategy: Build Back Greener (Department for Business, Energy & Industrial Strategy, 2021)
- Environment Act (Department for Environment, Food & Rural Affairs, 2021)
- National Infrastructure Strategy (HM Treasury, 2020)
- Gear Change (DfT, 2020)
- Cycling and Walking Investment Strategy / LTN 1/20 (DfT, 2020)
- The Government's Transport Investment Strategy (DfT, 2017)
- The Government's Road Investment Strategy 2 2020 - 2025 (DfT & Highways Agency, 2020)

Regional

- Norfolk Strategic Infrastructure Delivery Plan 2022 (NCC, 2022)
- Norfolk and Suffolk Economic Strategy (New Anglia LEP, 2022)
- Adopted Local Transport Plan 4 (NCC, 2022)

- Norfolk County Council Bus Service Improvement Plan (NCC, 2021)
- Investment and Delivery Plan (Transport East, 2020)
- Transport Strategy (Transport East, 2019)
- Norfolk County Council Environment Policy (NCC, 2019)
- The A47: Investing in East-West Success (A47 Alliance, 2019)
- Integrated Transport Strategy for Norfolk and Suffolk (New Anglia LEP, 2018)

Local

- King's Lynn Local Cycling and Walking Infrastructure Plan (LCWIP) (NCC and BCKLWN, 2022)
- King's Lynn Transport Study and Strategy (NCC and BCKLWN, 2020)
- North Runcton & West Winch Neighbourhood Plan 2016 - 2026 (BCKLWN, 2017)
- King's Lynn & West Norfolk Local Plan - Site Allocation and Development Management Policies (BCKLWN, 2016)
- BCKLWN Local Development Framework Core Strategy (BCKLWN, 2011)

National

Decarbonising Transport: A Better, Greener Britain (DfT, 2021)

2.3.2 In July 2021 the DfT published its decarbonisation plan, Decarbonising Transport: A Better, Greener Britain, which sets out the Government's commitments to changing the ways in which we travel to reduce carbon emissions. With transport responsible for 27% of the UK's domestic greenhouse gas emissions, the Plan recognises the need for a major shift to more sustainable modes including public transport, walking and cycling and zero emission vehicles. The Plan recognises that too many new developments are difficult to reach without the private car.

2.3.3 This commitment from the Government demonstrates the importance of ensuring the West Winch housing allocation site is accessible by sustainable modes of travel. The WWHAR includes provision for active modes with a shared-use path segregated from traffic and onward connectivity to the wider cycling and pedestrian networks.

Build Back Better: Our Plan for Growth (HM Treasury, 2021)

2.3.4 Build Back Better sets out the government's plans to support growth through significant investment in infrastructure, skills, and innovation.

2.3.5 It aims to address long-term problems to deliver growth that creates high-quality jobs across the UK and utilises the strengths of the Union. The 'plan for growth' is closely aligned the priorities of levelling up the whole of the UK, supporting the transition towards net zero, and supporting the vision for a global Britain.

2.3.6 The WWHAR scheme unlocks access to both housing and employment opportunities, as well as commercial space, community resources, and health facilities. A well-developed transport network will allow business in the region to grow and expand, enabling them to extend supply chains, deepen labour and product markets. This element of the scheme supports the government's efforts regarding economic recovery.

Bus Back Better (DfT, 2021)

2.3.7 Bus Back Better sets the vision for the future of local bus services and is key to achieving two of the government's wider priorities: net zero and levelling up.

2.3.8 The strategy aims to make buses greener, more frequent, more reliable, easier to understand and use, better coordinated and cheaper. It is linked with the government's funding announcement prior to the pandemic of £3bn of new funding to improve local bus services across England.

2.3.9 The strategy provided a timeline for achieving a better-connected bus network, with an expectation that by October 2021 all LTAs would publish a

local Bus Service Improvement Plan (BSIP), detailing how they proposed to use their powers to improve services. Successful authorities were notified of their BSIP funding awards in April 2022. Norfolk received the sixth highest allocation in the country, consisting of £30.9m of capital funding and £18.6m of revenue funding.

2.3.10 The WWHAR scheme objectives closely align to those of the National Bus Strategy, as both seek to achieve a more resilient and less heavily congested road network, which will contribute to improved air quality. Improvements to West Winch's bus network as part of the WWHAR scheme will improve accessibility, encourage mode shift away from the private car and further reduce the volume of non-local journeys through the village.

Net Zero Strategy: Build Back Greener (Department for Business, Energy & Industrial Strategy, 2021)

2.3.11 The Net Zero strategy sets out the government's long-term plan to end the UK's domestic contribution to man-made climate change by 2050. In terms of transport, the strategy presents a number of key policies and proposals to secure greener, faster, and more efficient transport. There is an aim to increase the share of journeys taken by public transport, cycling, and walking. A £3 billion investment to transform bus services and £2 billion for cycling will have a significant impact on local transport systems. Accelerating the decarbonisation of transport will save lives and significantly reduce noise, making urban centres more enjoyable places to live and work.

2.3.12 The WWHAR scheme is aligned with the key transport commitments outlined in the Net Zero Strategy. The scheme's active travel elements and connectivity with the local public transport network supports the 2050 decarbonisation targets set out in the strategy.

Environment Act (Department for Environment, Food & Rural Affairs, 2021)

2.3.13 The Environment Act brings about necessary action to combat the environmental and climate crises currently faced and acts as a key vehicle for

delivering the vision set out in the 25 Year Environment Plan through legally binding targets. This is to be achieved through:

- Protection of the natural environment from the effects of human activity
- Protection of people from the effects of human activity on the natural environment
- Maintenance, restoration or enhancement of the natural environment
- Monitoring, assessing, considering, advising or reporting on the natural environment

2.3.14 The WWHAR scheme aligns with the goals of the Environment Act by providing pedestrian and cycling connections, encouraging mode shift away from private car use. In turn, this will conserve and enhance the natural environment in King's Lynn.

National Infrastructure Strategy (HM Treasury, 2020)

2.3.15 The National Infrastructure Strategy, published in November 2020, sets out the Government's plans to transform infrastructure across the UK by 2050 by focusing on four overarching subject matters:

- Levelling up – boosting growth and productivity by investing in rural areas, towns and cities
- Zero emissions by 2050 – transforming infrastructure to decarbonise the UK's power, heat and transport networks, and adapting to the risks posed by climate change
- Supporting private investment – providing clarity on government plans to ensure confidence
- Accelerate and improve delivery – reforming the planning system, and improving the way projects are chosen, procured, and delivered

2.3.16 The government has set out a ranking for local authorities by priority category for levelling up, with 1 being the highest priority and 3 being the lowest. The

local authority of King's Lynn & West Norfolk (KL&WN) has been ranked as number one priority for levelling up funding. The WWHAR scheme has the potential to contribute to levelling up in the local area by providing improved transport links and increasing the housing supply to support economic growth.

2.3.17 The Strategy underscores the Government's commitment to creating rural communities with strong transport networks, thereby unlocking opportunity and supporting local economies. Active and sustainable travel remains a priority, with future funding having been committed for cycling (through active travel funds referenced in Gear Change) and bus improvements.

Gear Change (DfT, 2020)

2.3.18 In July 2020, the Government set out a plan to create a step-change in cycling and walking infrastructure in the coming years. The Government envisages an England that is a 'great walking and cycling nation', with cycling as a form of mass transit. Half of all journeys in towns and cities should be cycled or walked by 2030. To facilitate this, actions are grouped into four central themes:

- **Better streets for cycling and people** – thousands of miles of safe, continuous, direct routes for cycling in towns and cities, physically separated from pedestrians and motor traffic
- **Cycling and walking at the heart of transport, place-making and health policy** – significantly increasing dedicated cycling and walking funding, and creating a long-term cycling and walking programme and budget
- **Empowering and encouraging local authorities** – by increasing funding for local authorities, but also ensuring that Government funding is only granted to schemes that meet new standards. No funding shall be given to schemes that do not meet the new standards and principles established

- **Enabling people to cycle and protecting them when they do** – introducing new laws and safety standards

2.3.19 Gear Change was published alongside Local Transport Note (LTN) 1/20, outlined below. The design of the housing access road includes provision for cycling infrastructure, with a cycle lane on the north west side of the carriageway supporting the Government's aims to encourage active modes through improved infrastructure. Further, as part of the development Masterplan, active travel routes through the housing site are being considered, and wider LCWIP proposals are considering how to provide linkages between the housing site, King's Lynn and the wider area.

Cycling and Walking Investment Strategy / LTN 1/20 (DfT, 2020)

2.3.20 LTN 1/20, issued in July 2020, provides the accompanying design guidance to support Gear Change. It reflects current best practice, and states that, for schemes to receive Government funding for local highways investment where the main element is not cycling or walking, there will be a presumption that they must deliver or improve cycle infrastructure to the standards set out in the LTN, unless it can be shown that there is little or no need for cycling in the particular highway scheme.

The Government's Transport Investment Strategy (DfT, 2017)

2.3.21 In July 2017, the Transport Investment Strategy was published, which sets out the Government's planned approach to investment in transport infrastructure. The Transport Investment Strategy outlines aspirations to:

- Create a more reliable, less congested, and better-connected transport network that works for the users who rely on it
- Build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities
- Enhance our global competitiveness by making Britain a more attractive place to trade and invest
- Support the creation of new housing.

2.3.22 The Transport Investment Strategy prioritises the importance of transport investment in the development of housing. It states that "transport infrastructure is one of the keys to unlocking development and delivering places people want to live". The WWHAR scheme recognises that in order to bring forward the housing development proposals, a housing access road must also be developed, to ensure that the local transport network has the road capacity to accommodate the expansion. This will help improve regional road capacity, improve safety and make better connections between communities and businesses. In turn it can contribute towards unlocking further regional growth, due to the road capacity improvements attracting additional investment through the increased productivity and efficiency benefits of less delays.

The Government's Road Investment Strategy 2020 – 2025 (2020)

2.3.23 The Government's Road Investment Strategy 2 (RIS2) was reviewed in 2020 following the inaugural RIS1 which saw a £17 billion investment in the strategic road network (SRN). This second strategy sets a long-term strategic vision for the network, covering the financial years 2020/21 to 2024/25. During this period, the Government is committed to spending £27.4 billion. Some of this will be used to build new road capacity, but much more will be used to improve the quality and reduce the negative impacts of the existing SRN, so that every part of the country will benefit.

2.3.24 The RIS has identified points on the A47 that require investment. It recognises that the A47 has a number of current constraints, which include congestion hotspots stemming from insufficient road capacity, a lack of alternative routes and inadequate junction design, resulting in heavy rush hour delays and queues.

2.3.25 The WWHAR scheme recognises the relationship between housing and transport. The capacity improvements proposed prioritise the need for suitable transport infrastructure to facilitate and unlock housing development. It will provide the road capacity to maintain the current level of service of the network whilst bringing forward the 4,000 dwellings development proposal.

The WWHAR scheme targets improvements to the A47 and Hardwick Interchange, both of which are recognised within the RIS.

Regional

Norfolk Strategic Infrastructure Delivery Plan 2022 (Norfolk County Council, 2022)

2.3.26 The Council's Norfolk Strategic Infrastructure Delivery Plan (NSIDP) seeks to establish what additional infrastructure is required to support the planned increase in new homes and jobs, and the projected population growth within the Borough up to 2038. This plan focuses on regional transport infrastructure initiatives and highlights the importance of linking planned and existing infrastructure to housing. It recognises this as being an essential step towards promoting economic growth.

2.3.27 The WWHAR scheme is directly cited in this Infrastructure Delivery Plan, demonstrating the importance of this project within the region. The Delivery Plan highlights that to facilitate planned housing growth in West Winch a new road is required between the A47 and A10. This will enable the distribution of trips from the new development and alleviate congestion on the A10 through West Winch.

Norfolk and Suffolk Economic Strategy (New Anglia Local Enterprise Partnership, 2022)

2.3.28 The Norfolk and Suffolk Economic Strategy, published by the New Anglia LEP in 2022, details the approach for growing the local economy, and how it can "respond and succeed in a fast-changing world". The Strategy sets the ambitions for Norfolk and Suffolk to be:

- A higher performing clean, productive and inclusive economy
- An international facing economy with high value exports
- A well-connected place, locally, nationally and internationally
- An inclusive economy with an appropriate and highly skilled workforce, where everyone benefits from clean economic growth

- A place with a clear, defined, ambitious offer to the world
- A centre for the UK's clean energy sector

2.3.29 The Strategy recognises that to support growth in the economy a significant number of houses need to be constructed. By 2036, the two counties are aiming to create 140,000 new homes and 88,000 new jobs. Housing development will provide employment opportunities in the construction and new technologies sectors. The Strategy identifies King's Lynn, the A10 and rail corridor to Cambridge, and Great Yarmouth to King's Lynn (the A47), as 'priority places' and major growth locations. The strategic importance of the A47 is highlighted in the Strategy, as well as the ambition to dual the road.

2.3.30 The WWHAR scheme will support these ambitions by providing housing to support the workforce, and ensuring this housing is well connected to key employment locations. This will ensure that King's Lynn is an area where businesses want to invest and will boost the local economy and support the new levelling up agenda for the local population.

Local Transport Plan 4 (NCC, 2022)

2.3.31 The plan sets out how Norfolk ensures that transport's impacts are minimised, including how they will improve air quality in their towns and built-up areas, and how they plan to reduce carbon emissions. This draft plan contains a transport strategy that supports the council's environmental policies which include a target for a move towards carbon neutrality across all sectors by 2030.

2.3.32 To contribute towards this ambitious target, the strategy is built on seven key objectives. These include:

- **Embracing the future** – There is a need to focus on active and sustainable modes of transport such as electric vehicles, cycling and walking

- **Delivering a sustainable Norfolk** – Consideration of where new development should go to be best placed for the needs of communities and residents
- **Enhancing connectivity** – Improvements to the major roads and rail connections in Norfolk remain a priority for the LTP4. However, there must be a shift to less polluting vehicles using these strategic connections
- **Enhancing Norfolk's quality of life** – This includes the equality and social impacts of climate change and emissions and the measures for reducing carbon, increasing active travel and reducing inequalities
- **Increasing accessibility** – Priority for dedicated, segregated lanes for public transport and / or cycling on certain corridors in urban areas
- **Improving transport safety** – There is a need to reduce the number of killed and seriously injured on the road network by adopting a safe systems approach and working with partners to achieve this vision
- **A well-managed and maintained transport network** – Keeping roads, pavements and cycleways in good condition will enable the above objectives to be achieved

2.3.33 As part of its vision for a well-connected county, the LTP4 strategy describes the need for major transport improvements, including walking and cycling interventions, which will help meet Norfolk's objectives of improving transport to meet increased demand from growth in housing, jobs, and regeneration, as well as minimising the negative impact of congestion.

Bus Service Improvement Plan (NCC, 2021)

2.3.34 The Bus Service Improvement Plan (BSIP) for NCC presents an ambitious programme of measures and schemes based around the theme of ensuring buses play their full part in the county's journey towards a Net Zero transport system. In collaboration with bus operators and stakeholders in Norfolk, the Council has agreed a set of objectives which are four-fold:

- To rebuild and increase passenger confidence
- To have a green and sustainable transport offer
- To have a public transport network that is the first choice mode for most journeys, for existing and new customers
- To have a simple and affordable fares and ticketing offer

2.3.35 The Plan outlines a range of short, medium and longer term measures, covering the period April 2022 to April 2027. These include major marketing campaigns, improving the frequency of bus services, and the introduction of next stop announcements on 70% of buses.

2.3.36 The WWHAR scheme aligns with the BSIP objectives by providing residents with improved access to the wider public transport network. The access road will reduce traffic on the existing A10 and provide the opportunity for existing and new bus services to route through the WWGA in the future. The reduction in traffic on the A10 between the housing access road and the Hardwick Interchange will provide benefits to bus journey times and reliability. Bus priority measures are planned as part of the scheme which are anticipated to optimise congestion relief for buses.

Investment and Delivery Plan (Transport East, 2020)

2.3.37 The Investment and Delivery Plan provides a ‘snapshot’ of the strategic investment programme across the region. The core themes within the Plan align with those included in the Transport East Transport Strategy below. The Plan recognises King’s Lynn as a multi-centred hub, and King’s Lynn – Cambridge – Harlow – London as the ‘UK Innovation Corridor’ for which the A10 West Winch Housing Access Road is identified as a strategic scheme for this corridor. It is acknowledged that dualling of the A47 at West Winch will be important for opening up economic activity at Harlow and north of Cambridge.

Transport Strategy (Transport East, 2023)

2.3.38 Transport East is the Sub-National Transport Body (STB) that was established in March 2018 to deliver a "collective vision for the future of

transport and infrastructure in Essex, Norfolk, Suffolk, Southend-on-Sea and Thurrock". This vision seeks to transform the region's transport connections over the next 30 years to help drive long term economic growth.

2.3.39 The Transport Strategy sets out the region's ambitions and priority areas for improved connectivity. Six core strategic priority corridors are identified within the strategy that require particular focus and investment. The strategy has been endorsed by the local transport authorities, adopted by Transport East and recently endorsed by Ministers.

2.3.40 Transport East has identified three key themes that are said to define the unique transport geography of the region and provide an overarching narrative for the Strategy. These themes are:

- **Global Gateways:** Transport East will strive for better connected ports and airports to help UK businesses thrive and boost the nation's economy through greater access to international markets facilitating Foreign Direct Investment
- **Energised Coastal Communities:** Transport East see a reinvented, sustainable South-Eastern coast for the 21st century, which delivers on their ambition to become the UK's foremost all-energy coast, as well as providing a competitive visitor offer
- **Multi-Centred Connectivity:** Enhanced transport links between the region's fastest growing places and business clusters are seen as an enabler for the area to function as a coherent economy and bring about productivity gains

2.3.41 The WWHAR scheme supports these three objectives. Given its coastal location, the maritime sector is of strategic importance to Norfolk. The region is home to the Ports of Great Yarmouth, Lowestoft, Felixstowe and King's Lynn. The A47 links Lowestoft and Great Yarmouth Ports to Norwich and the Midlands. The WWHAR scheme will improve travel conditions on the A47 for freight traffic through increased capacity, reduced journey times and improved

network resilience. This will enhance the road access to these ports, increase productivity and ensure the ports have a competitive offer. The design of the existing A10 means that its connectivity to Cambridge and London is not fully exploited due to congestion and delays. The WWHAR scheme will divert this HGV traffic on the newly designed housing access road, improving journey times and reliability. This will help the region to be competitive in its logistics/freight offer, supporting growth at the ports/airport via the wider road network.

2.3.42 The WWHAR scheme will support Transport East's objective to energise coastal communities. The existing A10 and A47 provide access to key coastal locations for the energy sector and tourism. By improving travel times and reliability on these roads, the WWHAR will improve accessibility to/from the energy centre from the wider region. Improving journey times to tourist locations will support the ambition to have a competitive tourist offer.

2.3.43 To realise the economic potential of the growth opportunity in King's Lynn and West Norfolk, it is fundamental that these growth areas are connected to the wider road network and labour force. The WWHAR scheme will support this growth through improving linkages between fast growing places. This will benefit business to business movements, in particular freight, and also commuting trips. Improving journey times and reliability on the existing A10 and A47 will improve business efficiency and boost productivity. It will widen the labour pool within a commutable distance of these employment areas which will offer a more diverse, multi-skilled workforce. A strong labour force will encourage inward investment.

Norfolk County Council Environment Policy (NCC, 2019)

2.3.44 This policy reflects the areas that the Council sees as key to protecting and maintaining the health of Norfolk's distinctive environment and its occupants. One of the key goals outlined within the plan is 'supporting the community to make sustainable travel choices', specifically supporting alternatives to car travel including promoting sustainable public transport and initiatives which utilise the growing cycling and pedestrian improvements within the County.

2.3.45 The WWHAR supports this key goal by improving the walking and cycling links between the housing development site and King's Lynn town centre. Onward connections to public transport will be improved due to the active travel improvements.

2.3.46 In supporting sustainable travel, the walking and cycling elements of the scheme will contribute towards Norfolk's 2030 net zero carbon emissions goal outlined in the plan.

The A47 Investing in East-West Success (A47 Alliance, 2019)

2.3.47 The A47 Alliance is supported by local MPs and consists of organisations such as the New Anglia and Greater Cambridge and Peterborough LEPs, the Chambers of Commerce, and the constituent local authorities. The Alliance's purpose is to promote the long-term goal of dualling the A47.

2.3.48 The 2019 report recognises the key role the A47 plays in connecting a number of nationally significant businesses and organisations between Lowestoft, Great Yarmouth, Norwich, King's Lynn and Peterborough. Dualling the A47 would reduce business inefficiencies and delays travelling, attract more customers and allow businesses to invest with confidence.

2.3.49 The section of the A47 between East Winch and Tilney is cited as one of the three priority sections of the A47 to be dualled, this includes the A47 on approach to Hardwick Interchange. The Report acknowledges that dualling this priority section would support 16,500 new homes, the Nar Ouse Business Park and Enterprise Zone and support the planned expansion of Hardwick and Saddlebow Industrial Estates.

2.3.50 The WWHAR scheme directly supports this ambition to dual the A47 and strengthen the east west connection of the region. Bringing forward the housing site at West Winch will further support growth ambitions and priorities for the area.

Integrated Transport Strategy for Norfolk and Suffolk (New Anglia Local Enterprise Partnership, 2018)

2.3.51 The Integrated Transport Strategy looks ahead to 2040, whilst focussing on what is required in the short term to deliver this. It recognises the important role transport plays in delivering and supporting growth across Norfolk and Suffolk.

2.3.52 The Strategy identifies priority themes and places, within this the A47 to King's Lynn is considered a 'critical east – west growth corridor', and the A10 between King's Lynn and Cambridge is recognised as a priority place.

Local

Local Cycling and Walking Infrastructure Plan (BCKLWN, 2022)

2.3.53 The scheme is also aligned with the BCKLWN LCWIP. The LCWIP, by investing in cycling and walking networks, can help tackle some of the challenging issues facing the BCKLWN by providing the following impacts:

- Improving air quality
- Combating climate change
- Improving physical and mental health
- Addressing inequalities
- Reducing congestion

2.3.54 Pedestrian and cycle routes are included in the WWHAR scheme, providing connectivity within the new development, with neighbouring communities, and the open countryside. This element of the WWHAR scheme will alleviate some of the challenges outlined in the LCWIP.

King's Lynn Transport Strategy (NCC and BCKLWN, 2020)

2.3.55 Working in partnership, NCC and BCKLWN completed a study and devised a Transport Strategy for the town. The King's Lynn Transport Strategy (KLTS) was adopted by both councils in early 2020 and this seeks to alleviate existing problems whilst enabling new development opportunities to support future

economic growth. The KLTS includes an Implementation Plan of schemes and measures to be developed further and several workstreams are in progress stemming from this work. Notably, an LCWIP has been developed following the Gear Change and LTN 1/20 principles. The Study sets out a Vision Statement for the Transport Strategy:

"To support sustainable economic growth in King's Lynn by facilitating journey reliability and improved travel choice for all, whilst contributing to improve air quality; safety; and protection of the built and historic environment".

2.3.56 This Vision was then translated into a set of objectives which are to:

- Provide a safe environment for travel by all modes
- Encourage town centre accessibility by all modes whilst conserving and enhancing King's Lynn's rich historic environment
- Support sustainable housing and economic growth
- Reduce the need to travel by car through development planning
- Manage traffic congestion in King's Lynn
- Increase active travel mode share for short journeys
- Promote and encourage the use of public transport
- Reduce harmful emissions and air quality impacts

2.3.57 The Study designates that the A47 is a 'congestion hotspot' in peak hours, and that the A10 experiences congestion at West Winch in peak hours. Due to a lack of alternative routes, incidents on the A47 can impact considerably on the region. The Study notes the development of an access road between the A47 and A10 as a potential solution to some of the transport issues presented in King's Lynn, in particular to reduce emissions.

2.3.58 The WWHAR scheme supports the Vision and Objectives of the Transport Strategy. The scheme will support housing growth and managing traffic congestion, which in turn should stimulate economic growth. By reducing

levels of congestion and delays within the vicinity of West Winch village, the scheme should contribute to reducing harmful emissions.

North Runcton & West Winch Neighbourhood Plan 2016 – 2026 (West Winch & North Runcton Parish Councils, 2017)

2.3.59 The Neighbourhood Plan provides a policy framework that aims to define future development in the area, as well as nurturing a vibrant, integrated community.

2.3.60 The plan highlights that the A10 and A47 are important elements of the regional road network and that the high level of traffic can adversely affect local settlements. The Hardwick Interchange is a gateway to King's Lynn but is prone to rush hour and seasonal congestion. As part of the consultation for the North Runcton and West Winch Neighbourhood Plan (2016-2026), ongoing concern was raised by residents regarding the proposed 'growth area' development. Considering the Hardwick roundabout is already prone to significant 'rush hour' and 'holiday' congestion, 'rat running' was highlighted as a key concern along local lanes or through the villages of North Runcton and West Winch as drivers try to avoid the Hardwick roundabout.

2.3.61 The WWHAR scheme acknowledges and directly addresses residents' concerns of the possibility of increased housing activity exacerbating current congestion problems, through the understanding that transport and housing planning need to be integrated.

2.3.62 The WWHAR creates road capacity on the highway network for this additional demand and provides traffic management and junction improvements to the current network. It will provide the capacity to sustainably create a new community.

King's Lynn & West Norfolk Local Plan - Site Allocation and Development Management Policies (BCKLWN, 2016)

2.3.63 King's Lynn and West Norfolk's Local Plan is a comprehensive plan document identifying where development will take place. It includes policy descriptions and their relevance to growth in the area, focusing on housing developments,

transport strategies and mitigation schemes to reduce negative impacts of transport.

2.3.64 The Plan emphasises that the A47 and A10 roads are both essential to the future growth of the area and are in need of investment to improve their travel conditions. It highlights the current and future issues of the A10 and A47 routes, including:

- Congestion
- Noise
- Air quality
- Road safety

2.3.65 The growth ambitions of King's Lynn and West Norfolk are likely to exacerbate these issues in the future in the absence of action.

2.3.66 The Plan highlights that King's Lynn is under-performing in terms of housing. The Plan identifies West Winch as one of the "strategic urban expansion areas around King's Lynn". It recognises the allocation of land for housing by 2026, alongside the necessary supporting infrastructure.

2.3.67 The WWHAR scheme contributes towards the Plan's 'supporting infrastructure' statement, through providing a new road between the A47 and A10 and further enhancements to the existing network. This will aid providing the network capacity for the local area to feasibly support additional homes being built.

Local Development Framework Core Strategy (BCKLWN, 2011)

2.3.68 The Core Strategy sets sustainable development at the heart of the planning agenda for King's Lynn and West Norfolk. The vision is for sustainable growth, a sustainable economy and strong and healthy communities within environmental limits.

2.3.69 The Core Strategy recognises the A10 and the A47 as "assets of strategic importance, both essential to the future growth of the town and in need of

improvement". Further, the Strategy identifies West Winch as an area that will support the growth of the sub-regional centre (King's Lynn) through supporting significant residential development.

2.3.70 The WWHAR scheme aims to meet this growth ambition by bringing forwards housing in West Winch to support growth in wider King's Lynn. The scheme will also seek to deliver improvements to the A47 and A10 roads, ensuring they are able to maintain their strategic importance, and improve the quality of life for residents of West Winch.

2.4 Problems Identified

2.4.1 This section identifies and describes the need for intervention. It focuses on the identification of the problem, establishing it is and the challenge it poses to the BCKLWN and more widely. The following section discusses the impact of not changing and allowing these problems to exacerbate.

Housing Supply

2.4.2 On a national level the UK is facing a housing shortfall, and regionally over the last five years the local planning authorities of Norfolk have also struggled to meet their existing housing delivery targets. On a local level, the BCKLWN have a pressing need to identify sufficient locations to meet the housing targets set by central Government, achieving 83% of target house completions in the five years prior to 2019/20. This gives a shortfall of almost 100 homes a year.

2.4.3 Table 2.1 below shows the local housing completion rates for King's Lynn and West Norfolk over the five years to 2019/20.

Table 2.1 - King's Lynn and West Norfolk Housing Completions 2015/16 – 2019/20 (Table source: Borough Council of King's Lynn and West Norfolk Authority Monitoring Report)

Number of homes built	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	Average annual target	Actual annual average	% of target
KL&WN	520	395	384	342	591	539	446	83%

2.4.4 In addition, the delivery of affordable homes is currently below target. The Borough Council of King's Lynn and West Norfolk Housing Needs Assessment 2020 identified a need for 202 affordable houses per year in the Borough. According to the 2018/19 Authority Monitoring Report, in 2017/18 29 affordable houses were delivered, 41 in 2018/19 and 63 in 2019/20.

2.4.5 King's Lynn and West Norfolk has been identified as a strategic growth area in the 2022 Infrastructure Delivery Plan for South East King's Lynn Strategic Growth Area. Within King's Lynn there is a focus on brownfield redevelopment and renewal within the town, as well as urban expansion. The creation of the King's Lynn Enterprise Zone is a significant step towards this, with the 15ha Nar Ouse site including employment, residential and public facilities. Within this site there is the King's Lynn Innovation Centre which supports the development of local businesses. Further opportunities for employment growth are key sites in Hardwick Employment Park and Saddlebow Industrial Estate. This increase in economic activity and employment has resulted in an increase in demand for housing in a market already facing a shortage. This demand will increase as employment growth continues.

2.4.6 The River Great Ouse constrains growth to the west of the King's Lynn and West Norfolk borough, and the resulting flood risk areas restrict the locations where development can come forward. In addition to this, there are few sites identified that are large enough to provide the scale of development that is needed, and that are a commutable distance for these key employment sites.

2.4.7 With growing congestion on the roads, the necessity to deliver transport interventions alongside housing development is becoming greater. This creates a further barrier to the delivery of housing as it involves additional capital expenditure and scheme preparation that can make schemes infeasible without Government investment.

2.4.8 The housing shortage in King's Lynn and West Norfolk has led to housing demand outstripping supply and therefore substantial house price increases. Between 2014 and 2019 house prices in King's Lynn and West Norfolk

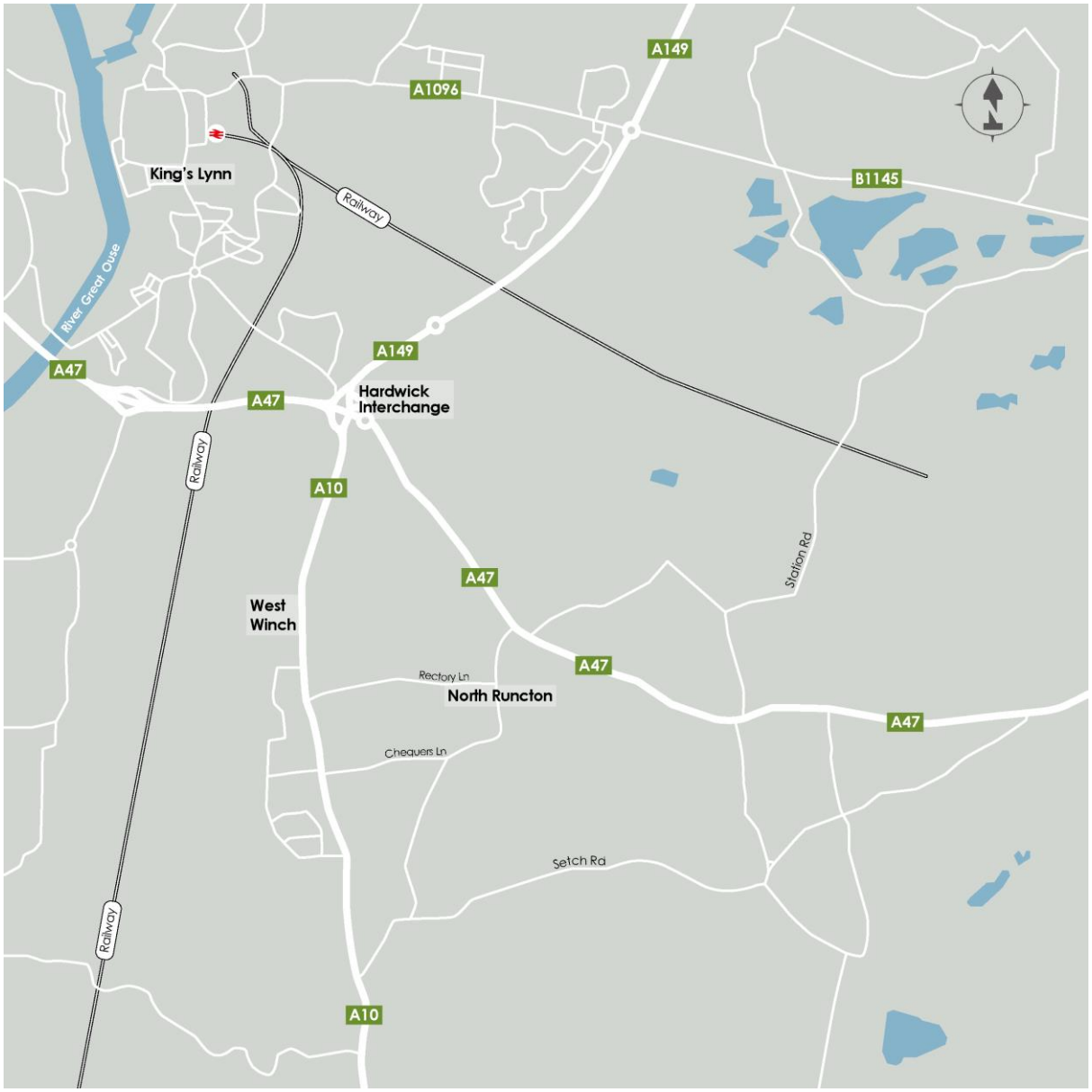
increased in real terms by 4.6% per year on average, and by 25% in total (source: Analysis of Land Registry House Price data). House price increases of this level will often price young, economically active, people out of the market. Businesses in the area are often faced with a skills gap due to a lack of housing limiting their accessible labour pool. It limits the ability to move jobs and match the supply of skills to demand. This can negatively impact business efficiency and productivity, deterring investment and restricting growth.

2.4.9 Due to the lack of housing supply, people are forced to live further from employment centres. This results in geographic immobility, restricting the ability of the population to move around the area in order to work. Longer distance commuting puts additional pressures on the local roads, including the A10 and A47.

Road Infrastructure

2.4.10 King's Lynn town centre is situated to the north of the interchange between the A10 and the A47 at Hardwick Interchange. Figure 2.14 shows the existing highway network in the study area.

Figure 2.14 – Existing highway network



2.4.11 The section of the existing A10 within the area is a single carriageway. There is a 40mph speed limit from the Hardwick Interchange to the south through West Winch and Setchey, it then increases to 60mph. Within West Winch there are numerous private accesses directly on to the road together with a number of minor road uncontrolled junctions. There are limited dedicated crossing facilities for pedestrians, and currently no provision for cyclists along the road. The provision of public transport services in the area comprises three bus routes and two coach routes passing through West Winch on the

A10 and into King's Lynn. Buses 37, 38 and 39 operate hourly, coaches 12 and 40 operate three times a day.

2.4.12 With its connectivity to Cambridge and London, the existing A10 is strategically important to the region and is heavily used by commuters, visitors and haulage companies. The section between Watlington and King's Lynn experiences some of the highest traffic levels on the A10, as stated in the A10 Ely to King's Lynn Stage 1&2 Baseline Report prepared by Cambridgeshire County Council in 2017. A traffic count undertaken in 2019 on the A10 immediately to the south of West Winch identified a daily flow of approximately 20,000 vehicles, of which over 11% are HGVs DfT Road Traffic Statistics. The section of the A10 on the approach to King's Lynn is prone to significant rush hour and seasonal congestion, regularly resulting in queues of 3-5km, as identified in the North Runcton & west winch Neighbourhood plan period 2016-2026. These queues result in extended and unreliable journey times. These delays are likely to be partly due to the decrease in speed limit from 60mph to 40mph due to the vicinity of the road to West Winch and Setchey. In addition, there are severance issues for the local community in West Winch due to the volume and nature of traffic using the A10. This volume of traffic through West Winch is also likely to be contributing to poor air and noise quality for local residents. On the A10 itself in this area, accident records show that over the last five years there have been 28 accidents, 4 of which were considered serious and the remainder slight.

2.4.13 As it currently operates, the character of the existing A10 through West Winch is not in keeping with a road on the Major Road Network (MRN) due to:

- A high number of direct accesses to private properties
- Numerous priority junctions with side roads, from which local traffic struggles to enter the A10
- Various controlled and uncontrolled pedestrian crossings

2.4.14 The section of the A47 within the area is a single carriageway. When approaching from the east, the 40mph speed limit starts approximately 150m from the Hardwick Interchange and through the satellite roundabout on Constitution Hill, where it then increases to 60mph.

2.4.15 The A47 is classed as a regional trunk road and a vital east-west corridor connecting Norfolk to the Midlands and the north. Its strategic location means that the A47 generates a high level of HGV movements. With a high level of HGV traffic on a single carriageway there are frequent slow-moving tailbacks and delays at pinch points. This results in high levels of congestion and a lack of network resilience.

2.4.16 The existing Hardwick Interchange is a major junction and a main gateway into and out of King's Lynn from the Strategic Road Network (A47). It comprises the following:

- A six-arm roundabout forming a junction with the A47, A10, A149, Hardwick Road and Beveridge Way, five of the six arms are traffic signal controlled
- A flyover above the roundabout that provides a single lane in each direction for east-west through traffic on the A47
- A satellite roundabout on the A47 Constitution Hill, east of the flyover, which forms a connection between the A47 and the main roundabout

2.4.17 At present the Hardwick Interchange is a known road capacity constraint and is responsible for significant delays for vehicles travelling to/from King's Lynn. The single lane flyover is insufficient to accommodate the east-west traffic flows on the A47. The roundabout has also been identified as a 'cluster location' for accidents within King's Lynn in the Kings Lynn Transport Study and Strategy, Evidence Gathering and Analysis of Current and Future Transport Problems and Opportunities (Norfolk County Council and Borough Council of King’s Lynn and West Norfolk, 2018).

2.4.18 King's Lynn has experienced an increase in economic activity over the last decade and a half. The development of the Enterprise Zone, and other strategic employment sites is making the town an increasingly attractive destination for working and living. From 2003 to 2016, there was 12% growth in jobs, amounting to 6,500 net new jobs, identified in the King's Lynn and West Norfolk Local Report for the Greater Cambridge Greater Peterborough (GCGP) Enterprise Partnership Area-Based Review, which can be found on the GCGP website. This growth has resulted in an increase in the number of vehicles travelling on roads within the region including commuting, freight and tourism traffic.

2.4.19 Over 76% of commuting trips within King's Lynn are by private car (as a driver). This is higher than the England and Wales average of 67% Journey to Work Census data 2021. In addition, a further 8% travel by private car as a passenger. This shows the fundamental role that the region's roads play in keeping people and businesses moving. In particular the significance of the A10, A47 and the Hardwick Interchange in providing connectivity to the wider region and UK.

2.4.20 Demand above capacity on the road network in the region, and the lack of alternative routes, has resulted in economic, environmental and safety problems.

Economic Implications

- Businesses rely on the road network for distribution and/or supply needs. These businesses have been presented with higher operating costs, while employees can be faced with longer commutes during peak congestion times. These can impact business productivity
- Employees and residents are faced with unreliable journey times making it difficult for drivers to predict the time needed for their journeys. The more time spent in traffic delays, results in less time spent for leisure or at work

- Collisions, roadworks and seasonal tourism can have more impact on single carriageway roads due to the lack of additional lanes or alternative routes. Without a second carriageway, or alternative road, it is difficult for the current carriageway to recover quickly from incidents or to accommodate unexpected peaks in demand
- Limits ability to bring forward housing development, given the dependency of housing on transport infrastructure

Environmental Implications

The King's Lynn and West Norfolk district has the highest CO_2 emissions per capita, compared to the other districts in Norfolk, with a total per capita emission (CO_2 per person) rate double that of the district of Great Yarmouth. This information can be found in the document library on the Norfolk Insight website. The increase in population from the housing growth will affect this, but the encouragement of non-motorised modes as part of the housing growth could go some way to offset the impact. There are no Air Quality Management Areas (AQMAs) within 200m of the scheme, but the removal of congestion should reduce emissions from stationary traffic

- Pollution can negatively impact heath, which in turn can harm regional productivity as people are absent from work

Safety Implications

- There has been a substantial increase in the number of vehicle accidents involving cyclists and pedestrians road accidents within King's Lynn and West Winch, with a 50% increase in serious casualties between 2017 and 2021 Road traffic statistics, DfT, 2017-2021. A number of accidents occurred within the vicinity of the Hardwick Interchange and on the A10 through West Winch
- This increase in accident levels results in:
    - loss of life or injuries that result in reduced quality of life

- further delays following accidents where there is a lack of alternative routes
- safety concerns for residents of West Winch, and decrease in desirability as an area to live due to close proximity to the road
- safety concerns for commuters and all road users

Summary

2.4.21 Table 2.2 summarises the joint housing and infrastructure problems faced in King's Lynn and West Norfolk and the wider County, and identifies which stakeholders are affected.

Table 2.2 – Problems identified summary

Category	Problem Identified	Key stakeholders affected or concerned
Housing Supply	Actual housing delivery in King's Lynn & West Norfolk has generally not kept pace with the projected housing delivery forecasts. Increase in housing demand brought about by the region's Enterprise Zone and targeted growth areas. Housing supply has led to increase in house prices, resulting in businesses having a restricted labour pool to hire from, house buyers being priced out, commuters/road users having to travel further distances and renters in the area being left with less disposable income.	Current resident population Future residents Local businesses (existing and potential) Employees Housing associations
Road Infrastructure	Growth in regional activity has increased car trips, yet there is a lack of road capacity and alternative travel routes which have put pressure on existing corridors. High levels of congestion have led to environmental, health, safety and economic problems.	Businesses that rely on the A47 and the A10 Employees/commuters Current residents Future residents Tourists/visitors

2.5 Impact of not Changing

2.5.1 Failing to address the issues of housing supply and road infrastructure will constrain local growth, and the potential of the region will not be fully realised.

2.5.2 The population of King's Lynn and West Norfolk is forecast to grow substantially in the coming years, with 13% growth forecast between 2016 and 2036, according to the March 2020 Borough Council of King's Lynn and West Norfolk Housing Needs Assessment. To 2022 there is forecast to be 4% growth in employment opportunities (representing 2,500 new jobs, identified in GCGP's Economic Review of King's Lynn & West Norfolk, 2016). This includes growth at the strategic employment locations within the Enterprise Zone at Nar Ouse. The region currently faces a challenging housing climate with demand far outweighing supply. This employment growth will add pressure to an already constrained housing market. Without change, 3,650 of the 4,000 homes proposed for the South-East King's Lynn Strategic Growth Area cannot be delivered. This site presents the primary housing development location for the area and therefore this scale of housing will be a challenge to deliver elsewhere due to flood risk constraints, and the housing deficit will continue. House prices will continue to rise as the gap between supply and demand widens. This will further price out buyers and negatively impact the rental market. A lack of housing can deter business expansion and local investment as it can result in labour shortages and poor investment opportunities. If the area cannot accommodate expansion, it will limit the economic growth of the area.

2.5.3 With high car dependency in the area, the forecast levels of growth will result in a further increase in road users and local traffic. Without transport intervention there will be ever increasing pressure put on the existing infrastructure. The current design of the existing A10 does not conform to characteristics expected as part of the MRN, for example, a high number of direct accesses to private properties, numerous priority junctions and pedestrian crossings.

2.5.4 There will be an increase in business costs and considerably longer commuting trips which would have detrimental impacts to the productivity and economic activity in the area. This could reduce the attractiveness and feasibility of inward investment to the area. In addition, the increase in car demand and congestion could lead to an increase in safety concerns for road users and the local communities near the roads. The increased car use can also have environmental impacts due to increased emissions and reduced quality of life.

2.6 Scheme Objectives

2.6.1 The objectives of this scheme have been shaped in line with the current national, regional and local policy landscape, as well as the specific problems set out in 2.4.

2.6.2 The resulting objectives for the scheme are:

- To drive economic growth by supporting housing delivery, employment growth and Levelling Up in King's Lynn
- To enhance the A10's role as a strategic link supporting the wider King's Lynn economy
- To provide a more resilient road network to improve journey time reliability and safety for all users
- To improve the quality of life for residents of West Winch by reducing the volume of non-local journeys through the village
- To provide better conditions in West Winch and along the A10 for travel by non-motorised modes
- To increase active mode connectivity with the wider public transport network
- To reduce carbon emissions and improve local air quality by alleviating congestion, supporting the decarbonisation agenda

2.7 Theory of Change

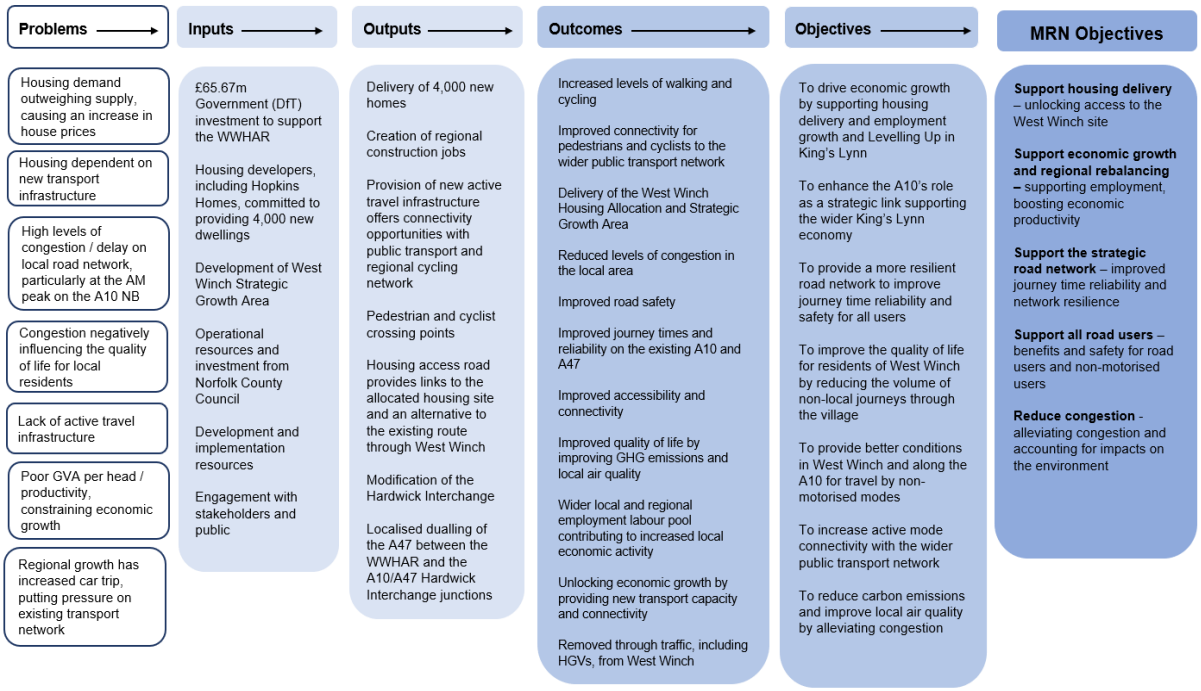
2.7.1 Logic mapping is a DfT recommended exercise to strengthen the evaluation of strategies for interventions. It assists in establishing internal consistency in the development of the scheme and sets out how a scheme will achieve a set of preferred outcomes. It demonstrates how different factors are interwoven in determining objectives and assists in the later monitoring and evaluation of the scheme.

2.7.2 The relationship between the investment in the WWHAR scheme and the realisation of the outcomes and impacts which will deliver the vision and objectives established for it is set out below against the Theory of Change Framework. The Framework includes five components in line with DfT guidance, as well as the scheme's alignment with the five central objectives of the MRN programme:

- Context / Problems – the problems identified when establishing the need for intervention.
- Inputs – what is invested e.g., money, skills, people, activities.
- Outputs – what has been produced.
- Outcomes – short and medium-term results (scheme objectives).
- Objectives – what is to be achieved as a result of the scheme
- MRN Objectives – the investment criteria used to assess MRN schemes

2.7.3 Figure 2.15 provides the logic mapping that sets out the relationship between the elements and the underpinning of the objectives set.

Figure 2.15 – WWHAR Theory of change



2.7.4 Considering the problems identified, the Theory of Change Framework demonstrates how the WWHAR scheme will address and achieve long-term outcomes. For example, the new access road to the east of West Winch will allow the full housing allocation on the West Winch Housing Allocation site to come forward. The cycling and walking elements of the scheme will enable a more sustainable and active travel network that enhances links to King's Lynn town centre. As a result, improved transport connectivity will stimulate economic recovery and facilitate job opportunities, therefore delivering economic growth across the local area.

2.7.5 The Theory of Change Framework further shows the alignment of the scheme objectives to national, regional, and local policy objectives, namely:

- Delivering new housing
- Supporting economic growth
- Improving connectivity and accessibility
- Reducing congestion

2.8 Option Development

Housing Delivery

2.8.1 The West Winch Growth Area site has been identified by NCC and BCKLWN as the most suitable location for this scale of housing development to come forwards. There are no other locations in the King's Lynn area where a development of this size could occur, and a single large site is preferred to enable a sustainable new community to be developed. Land within the borough is generally constrained due to flood risk from the River Great Ouse, however the West Winch site lies within Flood Zone 1 meaning it is at a low risk level. Further, identifying a site that has the capacity to deliver the scale of housing required is challenging. The West Winch site offers this capacity.

2.8.2 The Local Plan sets out that the housing allocation cannot come forwards in its full extent without transport infrastructure in place to mitigate the impacts of the development on existing and future users. Therefore, the option development for the scheme has been centred around identifying and refining the appropriate transport infrastructure to support the housing development. As well as serving the housing site, this option development has produced a solution that provides an effective bypass of West Winch and will mitigate the identified problems on the existing transport network in the area, namely high levels of congestion on the existing A10, A47 and Hardwick Interchange, and significant numbers of journeys on the A10 through West Winch.

2.8.3 The rate at which the level of housing can come forwards is based incrementally on providing adequate transport infrastructure. Based on the existing highway network, it is estimated that there could be capacity for about 350 houses to be developed on the Hardwick Green section of the West Winch Growth Area site to the north of West Winch (Pending Transport Assessment from developers). However, this will need to be demonstrated by the developer to the satisfaction of the local planning authority with advice from NCC. As shown in Table 2.1, this level of housing delivery will not meet the existing shortfall in homes in the area. This option would not address the existing road network issues. High levels of congestion would remain, and

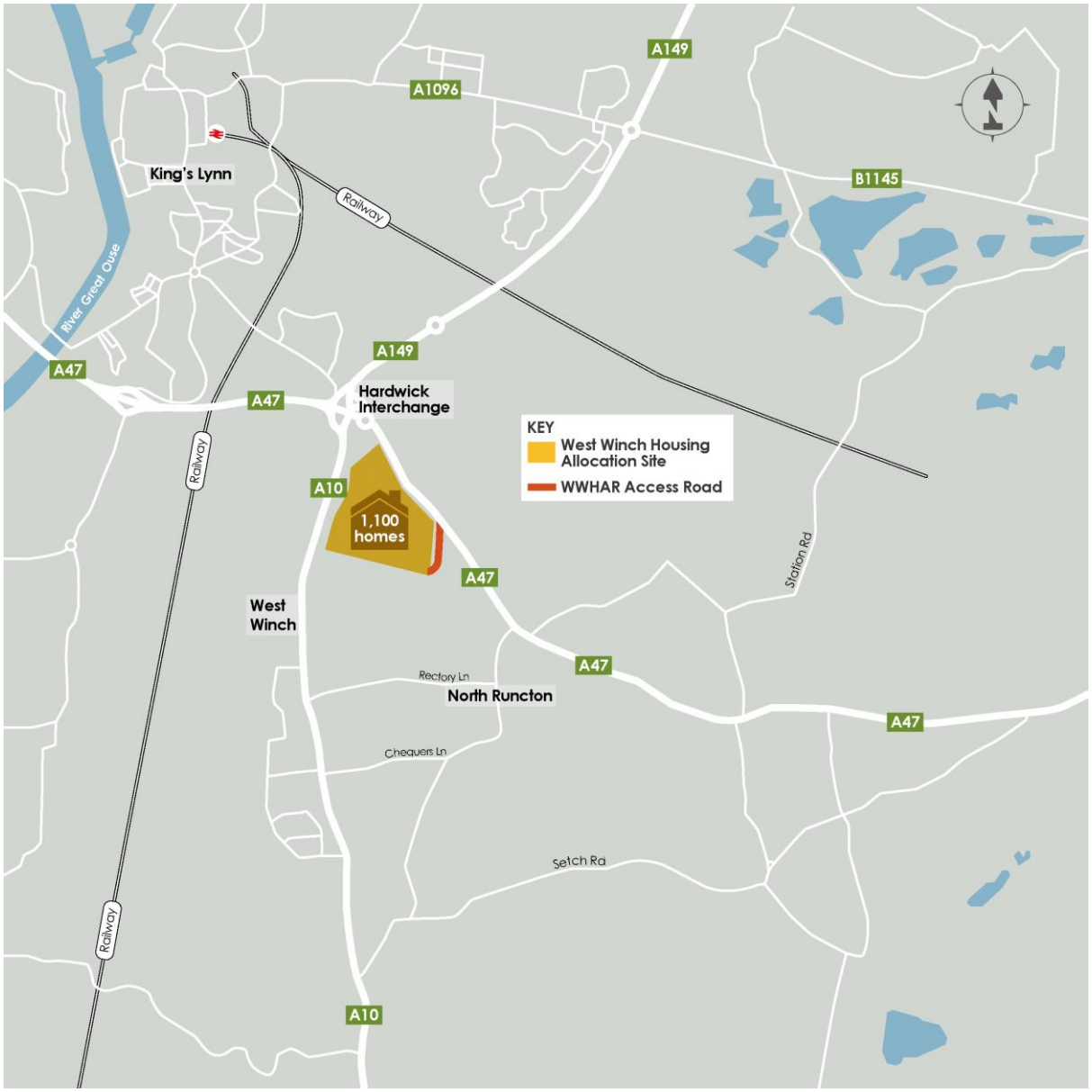
slightly worsen, on the A47 and A10, and traffic would continue to travel through the village of West Winch. For these reasons the 'Do Nothing' option is not considered a suitable solution to the existing problems.

2.8.4 It is likely that a further 750 homes on the Hardwick Green site could be developed provided that an access road is constructed linking the site to the A47 (pending transport assessments from developers). Although this option allows more housing development to come forwards, this is still likely to fall short of existing housing demand and forecast growth. Further this would not utilise the site to its full potential. It is also likely that the Hardwick Green developer would prefer to rely on the delivery of the WWHAR and make a suitable contribution as prescribed in the BCKLWN IDP, rather than building the scale of infrastructure that would be required. This option would not alleviate the congestion on the existing A10 or A47, nor improve conditions for residents of West Winch.

2.8.5 Figure 2-2 shows the infrastructure that would be delivered under this 'Reduced' option.

2.8.6 Constructing the WWHAR scheme will allow the full 4,000 homes on the site to be developed.

Figure 2.16 – Reduced option



General Alignment

2.8.7 The Local Plan dictates that a new route is required to enable the housing, therefore no non-road building/road improvement solutions have been investigated. However, the WWHAR scheme will incorporate improvements to non-motorised users and facilitate public transport solutions to support the housing growth.

2.8.8 The Local Plan, Site Allocations and Development Management Policies (adopted in 2016) indicated an approximate line for the access road that

formed part of the appropriate transport infrastructure to enable the housing growth. This information can be found on the West Norfolk website. This alignment was on the basis of the scheme development and options appraisal work.

2.8.9 It has not been possible to devise a low-cost option that achieves the scheme objectives.

2.8.10 Notwithstanding, alternative options for the WWHAR have been investigated and a preferred option selected. The options investigated comprised:

- 5 different alignments at the northern end of the new road between the A10 and A47
- 2 different alignments at the southern end of the new road between the A10 and A47
- A number of options for junction alterations at the Hardwick A10/A47/A149 junction to suit the rest of the scheme and satisfy National Highways

2.8.11 This option appraisal work is documented in three reports contained in Appendix B (refer to separate document).

- Route Alignment Options (Northern Section) - Technical Note 1 - December 2018
- Route Alignment Options (Central & Southern Sections) - Technical Note 2 - December 2018
- A47 Options (Hardwick) study

Preferred Scheme

2.8.12 The overall scheme includes:

- A new housing access road to the east of West Winch, connecting the A47 with the existing A10

- A roundabout on the new housing access road providing access to the Hardwick Green planned development
- Two roundabouts to serve proposed dwellings that are outside the planned Hardwick Green development
- A roundabout on the new housing access road, at its southern end, providing a connection to the existing A10
- Modifications to the existing Hardwick Interchange to accommodate additional housing traffic plus re-orientation of trips through the junction
- Dualling of the existing A47 between Hardwick Interchange (Constitution Hill roundabout) and the new housing access road
- A signalised roundabout junction where the new housing access road meets the A47; and
- Treatment of local roads severed by the new housing access road

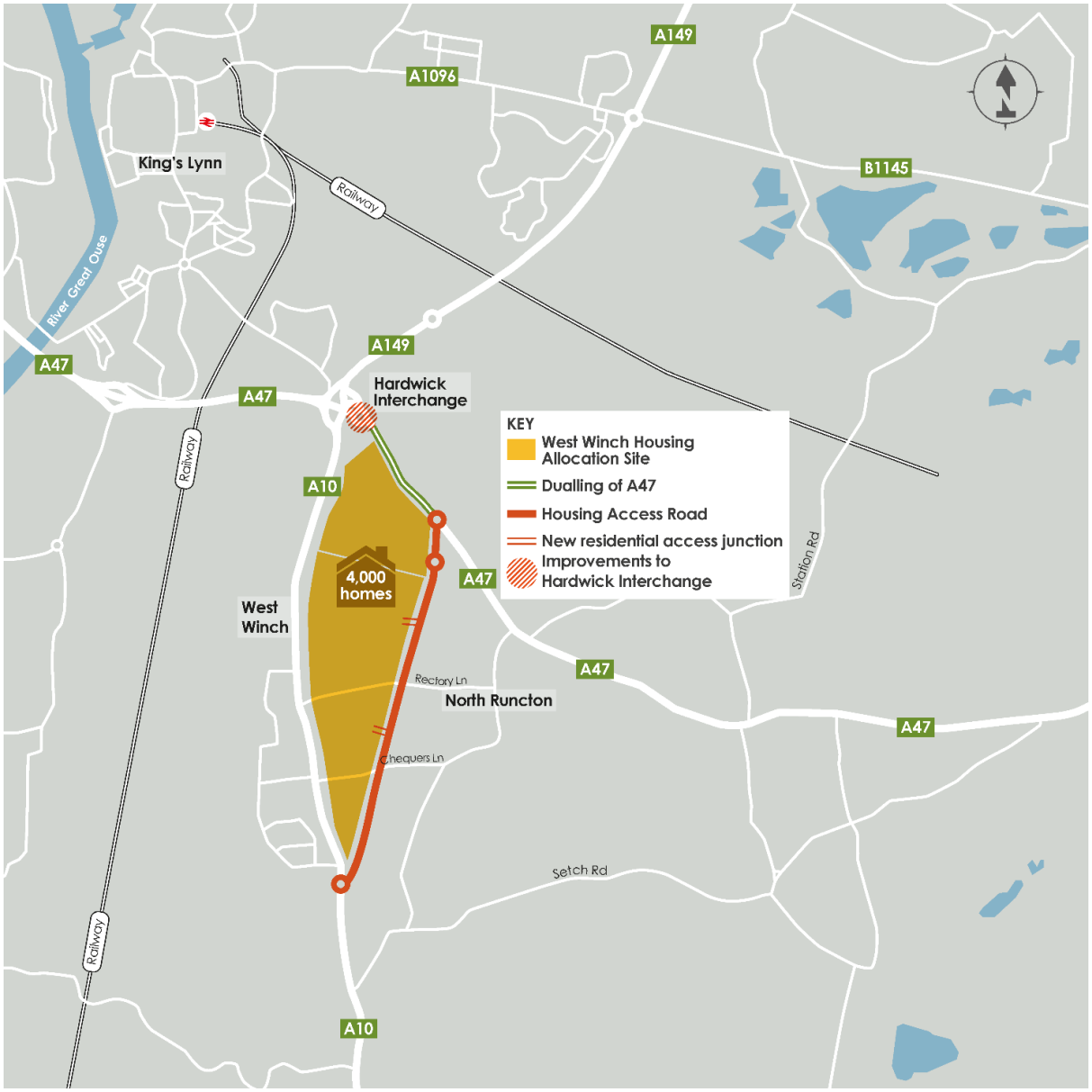
2.8.13 The existing through traffic on the A10 will be diverted onto the housing access road, bypassing West Winch village and leaving the existing A10 for local access. In order to encourage through traffic to divert on to the new route traffic calming measures will be introduced on the existing A10, reducing the severance currently created by the road. The layout of the housing access road would be consistent with the standards required to form part of the MRN. This option supports the scheme objectives, and aligns to the national, regional and local policy priorities. The benefit of the additional 2,900 homes that can come forwards under this full option (compared with the Reduced option), and the additional highway interventions, is likely to outweigh the incremental cost of extending to the full WWHAR scheme from the Reduced option (which provides a partial access road to the A47).

2.8.14 Therefore, the preferred option, which has been included in this OBC, is the delivery of the WWHAR scheme which would allow the full housing allocation on the West Winch Housing Allocation site to come forward. Detailed optioneering has been undertaken to design specific aspects of the WWHAR

scheme and its components. The following sections summarise the options considered for the scheme components, noting that scheme design is ongoing.

2.8.15 Figure 2.17 below shows the WWHAR scheme.

Figure 2.17 – WWHAR scheme



Hardwick Interchange

2.8.16 At present the primary movement along the A10 is into King's Lynn in the AM peak period, and out of King's Lynn in the PM peak period. These traffic flows

on the A10 exceed the east-west flows on the A47. Therefore, the main movement through Hardwick Interchange is north-south on the A10.

2.8.17 With the housing access road in place a large proportion of the existing A10 trips and new residential trips will join the Interchange from the east. Modification of the existing interchange's layout is required to provide the capacity to accommodate these trips. The extent of the modifications required has been established through close collaboration with National Highways.

2.8.18 WSP was commissioned jointly by both NCC and National Highways to investigate possible options for the modification of Hardwick Interchange. WSP identified seven options for the modification of the interchange. These were sifted and a preferred option was recommended to National Highways. This process is described within WSP's *'A47 Options Study Report'* which is included at Appendix B (refer to separate document).

2.8.19 National Highways has agreed that the appropriate modification of the Hardwick Interchange should comprise:

- Removal of the Constitution Hill satellite roundabout
- Provision of new east-facing slip-roads connecting the main A47 carriageway with the interchange's circulatory carriageway below
- Minor re-configuration of the southern part of the circulatory carriageway together with re-timing of the interchange's traffic signals

2.8.20 The works described below are illustrated in the detailed designs included at Appendix C (refer to separate document).

2.8.21 The provision of new slip roads for the Hardwick Interchange requires that the existing dismantled railway will need to be bridged over. This is to ensure the route remains available for improvements to active travel.

A47

2.8.22 The WWHAR scheme will increase traffic flows on the A47 between the new A47 junction and Hardwick Interchange. Modelling work undertaken indicates

that this section of the A47 would need to be widened to a dual carriageway to cater for this increased flow. In designing the dualling of the A47, the merits and constraints of widening the road to the north or south were considered. Widening the A47 to the north of the existing road is less likely to impact on the land allocated within the Hardwick Green planning application and the associated green space provision. It would also have less impact on the area of Common Land immediately south of the existing A47, although noting there is a strategy in place for dealing with the Common Land. Other land designated as green open space as part of the growth area masterplan will be designated Common Land to offset that which is lost from the A47 verges, if this is deemed necessary. Discussions with legal counsel in preparation for the application are ongoing.

A47/Housing Access Road Roundabout

2.8.23 A new roundabout on the A47 has been proposed at the junction with the housing access road that links the A10 and A47. The original option considered was an offline roundabout to the south with single lane approaches to the south and east. Modelling work has indicated that although this design could cope with the development on the Hardwick Green site, it could not accommodate the traffic when the full 4,000 homes are developed. The primary performance constraint relates to insufficient stop line capacity and unbalanced flows at the roundabout (in the AM most movements are south to west, with the reverse in PM). The heavy PM movement of traffic turning right from the A47 onto the housing access road that links to the A10 results in significant queuing on the A47 eastern arm. In order to address the imbalanced flow issues, the roundabout design includes traffic signals. A segregated left-turn bypass lane on the approach to the A47 roundabout from the west will reduce delays on the A47 for east-west movements.

Hardwick Green Access Roundabout

2.8.24 As part of the Hardwick Green development, there are proposals for an access roundabout on the housing access road element of the scheme. Based on modelling undertaken, it is proposed to dual the northern section of

the housing access road element, between the Hardwick Green Roundabout's northern arm and the A47 roundabout.

Housing Access Road

2.8.25 Traffic modelling indicates that a single carriageway road is required for the housing access road between the existing A10 and the Hardwick Green access. Between this roundabout and the A47 tie-in there is a short dualled section to allow capacity for vehicles on approach to the A47 roundabout. The alignment of the proposed housing access road incorporates an overtaking section between the existing A10 and the southern residential access. The key factors influencing the design of the housing access road include:

- Design standards set out in DMRB
- Site topography
- Significant utilities
- Environmental constraints including drainage
- Land ownership
- Relating policy e.g. Neighbourhood plans

2.8.26 The primary constraints which influenced the design are the Common Land adjacent to the A47, the outstanding Hopkins Homes planning application, woodland, the presence of two nationally important high pressure gas mains running east-west through the area and maintaining access to all affected properties.

Existing Side Roads

2.8.27 The housing access road intersects with Rectory Lane and Chequers Lane, two existing single carriageway roads which connect the villages of West Winch and North Runcton. The proposed housing access road design includes an east-west vehicular bridge on Rectory Lane with a shared footway/cycleway on one side. A pedestrian and cycle bridge on Chequers Lane is proposed over the housing access road. Neither bridge would connect

with the housing access road. The purpose of the bridges is to provide high levels of local connectivity between the two villages whilst discouraging rat-running for strategic traffic between the existing A10 and A47.

Residential Accesses

2.8.28 The WWHAR scheme will facilitate the development of 4,000 new homes, therefore the road must provide appropriate access to this site, but not compromise the function of the WWHAR scheme as a major north-south route that is part of the MRN. Analysis suggests that two further junctions (in addition to the Hardwick Green Access Roundabout) are required to serve the dwellings. A signalised roundabout where the housing access road meets the A47 and at the southern end to connect to the existing A10 will benefit residents whilst minimising disruption for other users.

Housing Access Road/Existing A10 Tie-in

2.8.29 It is proposed that the southern tie-in of the WWHAR with the existing A10 is via a roundabout. A priority junction has also been considered for this location, but given the anticipated traffic flows on the WWHAR, modelling suggested it could become difficult for traffic to exit the minor arm.

2.8.30 Table 2.3 below summarises the WWHAR Scheme preferred design.

Table 2.3 – WWHAR scheme preferred design

Component	Preferred Design
Hardwick Interchange	Removal of the Constitution Hill satellite roundabout, provision of new east-facing slip-roads connecting the main A47 carriageway with the interchange's circulatory carriageway below, and minor reconfiguration of the southern part of the circulatory carriageway together with re-timing of the interchange's traffic signals.
Dualling the A47	Dualling of the A47 north of the existing alignment between Hardwick Interchange and the proposed A47/housing access road roundabout.

Component	Preferred Design
A47 / Housing Access Road roundabout	Provision of a signalised roundabout at the A47/housing access road roundabout.
Hardwick Green Access Roundabout	Access roundabout from WWHAR to site. Recommendation that the northern arm is dualled up to the A47/housing access road roundabout.
Housing Access Road	A single carriageway road (except for the dualled section between the A47 roundabout and the Hardwick Green access).
Existing side roads	Provision of a low-speed vehicular bridge over the WWHAR along Rectory Lane with a shared footway/cycleway on one side. Provision of a bridge for pedestrians and cyclists on Chequers Lane.
Housing Access Road/A10 Tie-In	Roundabouts to facilitate housing access (in addition to the Hardwick Green access) without detracting from the strategic purpose of the WWHAR.

Updated Scope

2.8.31 The WWHAR will provide a 2.4km route of new highway infrastructure connecting the A10 to the A47 via signalised roundabouts at the northern and southern tie-in points. The delivery of this scheme will support the development of the Housing Allocation site. The scheme comprises:

- A housing access road to the east of West Winch connecting the A47 with the existing A10
- A roundabout on the housing access road providing access to the Hardwick Green (i.e. Hopkins Homes) planned development
- Two roundabouts on the housing access road to serve proposed dwellings that are outside the planned Hardwick Green development
- A roundabout on the housing access road, at its southern end, providing a connection to the existing A10

- A signalised roundabout junction where the housing access road meets the A47
- Modifications to the existing Hardwick Interchange to accommodate additional housing traffic plus re-orientation of trips through the junction (these modifications include new east-facing slip roads and changes to the Interchange's circulatory carriageway)
- Dualling of the existing A47 between Hardwick Interchange and the housing access road
- Treatment of local roads severed by the housing access road

2.8.32 The preferred option at SOBC stage included two priority junctions to serve the proposed dwellings that are outside the planned Hardwick Green development. However, to ensure a smoother flow of traffic and a reduction in journey times, it is now proposed that the two priority junctions are changed to roundabouts on the housing access road.

2.8.33 Since the preparation of the WWHAR SOBC, national transport policy has shifted to focus heavily on the promotion of sustainable and active modes, levelling up the UK, and decarbonising the transport network in order to achieve 'Net Zero' transport emissions by 2050. Accordingly, the scope of the scheme has been extended to include additional active travel and public transport measures.

2.8.34 Considering the changes to the policy landscape, WSP have been commissioned by NCC to prepare a Sustainable Transport Strategy (STS) to accompany the OBC submission for the WWHAR. The STS responds to queries raised by DfT in respect of active travel provision and bus priority. It has been developed alongside the main WWHAR design proposals set out in Table 2.3 and presents a range of complementary interventions to support the sustainable travel objectives of the WWHAR scheme, predominantly active travel, travel management, and bus priority options. Specifically, these options include:

- **Crossings / Accessibility Options:**
  - Signalised crossing points / raised tables at key entry and exit points
  - Non-Motorised User (NMU) connections between Rectory Lane and the proposed access road
  - Crossings and shared routes at the southern end of WWHAR to the new school to the south west of West Winch
  - Segregated cycle route on the western side of the A10
- **NMU Route Options:**
  - Pedestrian / cycle route from the north of the development towards Hardwick Roundabout
  - Connectivity with Hardwick Industrial Estate – no existing route for cyclists
  - Cycle route from West Winch towards Watlington station
  - NMU routes via former railway lines towards East Kings Lynn / under A47 and beyond
  - Upgrades to FP1 / FP2 / RB2
- **Public Transport Route Options:**
  - Bus priority on the approach to Hardwick Roundabout
  - Re-routing of existing bus services to serve the new development
  - New fast bus services to Kings Lynn / Watlington
  - Changes to existing service patterns – more evening and weekend services
  - Increased 7am-7pm frequency on existing services

2.9 Stakeholders

2.9.1 Given the scale of the intervention proposed, there is a wide-ranging set of stakeholders that have an interest in the scheme.

2.9.2 The main stakeholder groups associated with the scheme are as follows:

- Norfolk County Council
- Kings Lynn & West Norfolk Borough Council
- Parish Councils within BCKLWN
- New Anglia Local Enterprise Partnership
- Transport East
- Norfolk Members of Parliament
- National Highways
- Homes England
- Department for Transport
- Environment Agency
- A47 Alliance
- Local businesses
- Enterprise Zone businesses and employees
- Local residents
- Local employees
- Land owners
- Housing developers including Hopkins Homes
- Road users
- Bus and haulage companies

- Non-Motorised road users
- Utilities companies

2.9.3 Detail on engagement with some of these key stakeholder groups is set out below. Letters of Support are included in Appendix D (refer to separate document), the views of other key stakeholders are being sought.

Local residents

2.9.4 As discussed in the Constraints section (Section 2.10), providing the WWHAR scheme, which will also provide an effective bypass of West Winch, is widely supported. However, it is acknowledged that because the WWHAR is essential to enable the housing growth, some might see opposing the road as an opportunity to prevent the housing developments from taking place. NCC and BCKLWN are alive to this possibility and the current programme allows time for addressing such a challenge if it were to occur.

2.9.5 Generally, because of the level of congestion on the existing road network and the detrimental impact of through traffic in the village, the local communities are firmly united behind the view that no housing should be allowed to come forwards prior to the development of the WWHAR scheme. However, subject to Transport Assessments submitted as part of planning applications for housing in the growth area, the BCKLWN may allow early phases to be developed, based on sound evidence, before the WWHAR scheme is in place.

Parish Councils

2.9.6 NCC and BCKLWN have worked closely with the Parish Councils within the Borough of King's Lynn and West Norfolk as the proposed scheme has been developed. A workshop was held with the local Parish Councils in Spring 2019 to discuss the scheme and how the local roads it crosses should be treated. This engagement was very positive and gave rise to a consensus on Rectory Road needing to pass over the scheme and not be connected, and for Chequers Lane to be severed by the scheme.

2.9.7 A regular stakeholder group with the local Parish Councils has now been set up by BCKLWN, led by one of their senior members. This includes their planning and legal advisors and NCC officers to ensure local viewpoints are accounted for, and the scheme is designed to meet the needs of the local residents as it progresses.

Land Owners

2.9.8 The West Winch Growth Area Delivery Group has been set up by BCKLWN for landowners within the growth area, including some whose land will be required to construct the road.

2.9.9 The Legal Constraints section outlines the engagement NCC and BCKLWN have had with landowners to date.

NCC / Norfolk Members of Parliament

2.9.10 The local NCC member for Clenchwarton and King's Lynn South, where the scheme is located, supports the scheme and the funding bid. They recognise the scheme is critical to addressing connectivity issues for King's Lynn and maximising the economic potential of the area. Further the importance of the scheme in allowing the housing development to come forward.

2.9.11 The local MP, James Wild (North West Norfolk), has expressed his support for the scheme and for the MRN funding bid to the Leaders and Chief Executives of both KLWNBC and NCC. He believes the WWHAR is crucial to unlocking the housing growth.

Transport East

2.9.12 The Sub National Transport Body for the scheme is Transport East. Transport East submitted priorities for MRN schemes in July 2019, supported by a Regional Evidence Base. It reaffirmed its commitment to the scheme at a meeting held on 3 November 2020.

National Highways

2.9.13 National Highways (NE) is a key stakeholder as the WWHAR scheme involves improvements and alterations to their network. NE has been actively

involved in the project since summer 2019 and collaborated with scheme promoters to devise appropriate solutions for the scheme that they can support.

Stakeholder Engagement

2.9.14 NCC will build upon the initial stakeholder engagement undertaken for the OBC, and on the relationships developed with businesses, residents and all other interested parties. Stakeholders will continue to be engaged throughout the development of the Full Business Case, and the delivery phase.

2.9.15 Additional detail on stakeholder management activities undertaken to date, as well as the ongoing stakeholder engagement strategy can be found in the Management Dimension.

Consultations

2.9.16 Stakeholder consultation has been undertaken in preparation for the WWHAR scheme. Early consultation activity included Parish engagement with the Princes Foundation in 2010/11 and masterplanning work for the growth area, leading to allocation of the scheme in the Local Plan. Further Parish engagement helped shape the strategy for side roads for Rectory Lane and Chequers Lane, predating the Borough setting up a West Winch Growth Area stakeholder group. Following this, a workshop with the local Parish Councils in 2019, showed extensive support for an access road to serve the proposed housing development in West Winch. As the scheme developed, specific consultation was carried out on the WWHAR, the details of which can be found in Section 6.7of the Management Dimension.

2.9.17 KLWN's WWGA masterplanning consultation took place in summer 2022. The pre-planning application consultation then ran for 8 weeks between 14 November 2022 until 8 January 2023, consisting of an online survey and three in person drop-in events at West Winch Primary School and The Village Meeting Place in North Runcton. A total of 149 respondents provided valuable feedback to the consultation. NCC has engaged with local communities to ensure the proposed route meets the needs of local people and take

advantage of local knowledge. Overall, the results demonstrated a mix of support and concern, in particular over congestion and the impact to surrounding areas. Suggestions for alterations to the proposed design and requests for more landscaping were amongst other items raised in the 2023 Cabinet Agenda Paper prepared by NCC.

2.9.18 The proposed walking and cycling links parallel to the access road were largely supported by respondents, as were new controlled crossing points for pedestrians and cyclists.

2.9.19 Concern over environmental impacts and the potential impact of congestion were emphasised, with particular concerns noted over delays on the A47 and Hardwick Interchange, and potential damage to the rural setting of West Winch. Feedback from the consultation substantiates the problems outlined in Section 2.4 as the A47 is an existing congestion hotspot with frequent slow-moving tailbacks and delays at pinch points.

2.10 Risks, Constraints and Dependencies

Constraints

2.10.1 This section sets out the key constraints that may influence the scheme and the form that they take. It considers the constraints under the broad themes of physical, environmental, legal and public acceptability constraints.

2.10.2 The Local Plan identifies the general alignment of the scheme, therefore this has informed and guided the development of the scheme design. The alignment being set in policy has constrained the range of potential options that have been considered for the housing access road.

Physical

2.10.3 Chequers Lane and Rectory Lane are two roads which run east-west between West Winch and North Runcton. It is important to retain local connectivity on these roads between North Runcton and West Winch villages, which also acts as a public acceptability constraint. Consideration will also need to be given to

measures to avoid strategic traffic from 'rat running' on these roads or through the villages of North Runcton and West Winch.

2.10.4 The Options section (Section 2.8) outlines the physical constraints that have influenced the design of the highway scheme.

Environmental

2.10.5 The River Great Ouse flows northwards to the coast and constrains growth/development within King's Lynn and West Norfolk. It runs to the west of West Winch and the existing A10, and therefore much of the surrounding area is at risk of flooding and is undeveloped. The study area is almost wholly within Flood Zone 1. This relatively unconstrained flood risk is a key reason the site has been identified for development by NCC and BCKLWN. The very northern section of the A47 (adjacent to Hardwick Interchange) is partially located within Zones 2 and 3.

2.10.6 There are five Noise Important Areas (NIAs) along the existing A10 between the Hardwick Interchange and the proposed tie in with the WWHAR. The nearest Air Quality Management Area (AQMA) is located approximately 1.4km north west in King’s Lynn.

2.10.7 The scheme is not located within any statutory or non-statutory designated sites. However, the River Nar Site of Special Scientific Interest (SSSI) is located approximately 1.2km south of the scheme (from the southernmost section). The scheme area does, however, have the potential to support protected species such as bats, badgers, otters, water voles, breeding and wintering birds, reptiles and amphibians. There are no Special Area of Conservation (SAC) with bat interest located within 30km of the scheme.

2.10.8 No designated heritage sites are located within the scheme corridor. There are no Areas of Outstanding Natural Beauty (AONB), National Parks or Country Parks within 2km of the scheme. There are several Public Rights of Way (PRoW) in close proximity to the scheme.

2.10.9 NCC will build upon the initial stakeholder engagement undertaken for the OBC, and on the relationships developed with businesses, residents and all other interested parties. Stakeholders will continue to be engaged throughout the development of the Full Business Case, and the delivery phase.

2.10.10 Appendix E (refer to separate document) shows the environmental constraints plan for the study area. The Environmental Scoping Report included in Appendix F (refer to separate document) to this OBC provides a more detailed review of the baseline environmental conditions for the scheme area.

Legal

2.10.11 The housing allocation site is in multiple ownership, with over 20 individual landowners and some of these have land which will be required to construct the WWHAR. Two planning applications have been submitted to date. For the remaining sites, BCKLWN and their advisers have been working to develop a Collaboration Agreement between the landowners. The Collaboration Agreement is a commercial facility to deliver the land more equitably to ensure the overall Masterplan comes forward. The intention is that there will be an overarching Masterplan S106 Agreement that all landowners will need to sign up to. Beneath this there will be specific individual S106 agreements related to each site. At the heart of this structure is a Collaboration Agreement to ensure land values are equalised whether an individual parcel is used for housing, green open space or the WWHAR for example.

2.10.12 In order to expedite work on the Collaboration Agreement, BCKLWN have bought an option on a significant area of land in the growth area. This together with land owned by NCC forms almost 50% of the land required to develop the growth area. The Borough Council and NCC are in the process of combining their land in a One Public Entity (OPE) undertaking.

2.10.13 The expectation is that the Collaboration Agreement work will be completed before the submission of the OBC. Both councils are aware of the

importance of having control of the land to build the road and have discussed the prospect of falling back on a CPO process should that prove to be necessary.

Public Acceptability

2.10.14 One objective of the scheme is to divert through traffic away from the existing A10 such that it is primarily used for local access to West Winch village. This aspect of the scheme is widely supported, and the local communities concur that no housing should be able to come forwards without significant transport intervention. However, there may be opposition to the housing development more generally as it is on greenfield land. This will impact on the local amenity and landscape.

2.10.15 Section 2.9 lists the key stakeholders associated with the scheme, and the Management Dimension sets out the approach to stakeholder engagement and management.

Interdependencies

2.10.16 As this Strategic Dimension has set out, bringing forward the housing allocation at the West Winch site is underpinned by delivery of the necessary transport interventions. This link between housing delivery and road infrastructure is the key interdependency of the project. The desirability of the housing site as a place to live will be dependent on sufficient connection from the site to employment and other strategic locations within King's Lynn and beyond. Without this, uptake of the housing may be at risk. Therefore, transport intervention is not only a necessity from the perspective of the capacity of the road network, but also for the successful uptake of the housing units.

2.10.17 As discussed previously, the scope of this scheme is the delivery of the WWHAR scheme, not the delivery of the housing development itself. However, there is a clear relationship where the success of each element is interlinked. For the housing allocation to be developed there is a need for planning permission for the sites. Two planning applications have already

been submitted. However, the remaining allocation will also be required to undergo this process. As part of this planning process, developer contributions to the scheme will be secured to support the affordability of the proposals.

A47 Dualling

2.10.18 National Highways has committed £300m to improve the A47 at six locations, four of which are in Norfolk. The Norfolk improvements are:

- Dualling the A47 North Tuddenham to Easton
- Dualling the A47 Blofield to North Burlingham
- Improving the A47/A11 Thickthorn junction
- Improving A47 Great Yarmouth junctions including the Vauxhall Roundabout and Harfrey's Roundabout

2.10.19 Development Consent Orders (DCOs) were granted for the A47 Blofield to North Burlingham and North Tuddenham to Easton dualling schemes. The A47 Great Yarmouth junction improvements scheme is at an earlier stage of the process. An agreement between NCC and National Highways has been made so that the Harfrey's Roundabout improvements can be made before the opening of the Great Yarmouth Third River Crossing in summer 2023. Works on the Vauxhall Roundabout scheme is due to begin shortly after the opening of the Third River Crossing.

2.10.20 The WWHAR will contribute to this growth by providing an alternative route around the village of West Winch, reducing pressure on the congested A47 at the Hardwick Interchange.

King's Lynn Sustainable Transport and Regeneration Scheme (STARS)

2.10.21 In August 2022, a bid to the Government's Levelling Up Fund was submitted by NCC for the £26.8m King's Lynn Sustainable Transport and Regeneration Scheme (STARS). The bid was approved in January 2023 and

work has started on the OBC, which will be submitted to the DfT in early 2024. The STARS project is comprised of two elements, which intend to:

- Transform the historic Southgates area - The scheme will reduce the impact of traffic by making the Southgates roundabout into a junction. This junction will have bus priority and better facilities for cyclists and pedestrians
- Improve the outdated gyratory road system – The scheme will improve the gyratory system by transforming the public area on Railway Road. Bus priority measures and walking and cycling routes will be included

2.10.22 The delivery of the scheme will bring benefits for the whole of the borough, improving access to employment opportunities, educational facilities, and public transport links. A resilient transport network is needed in King's Lynn to support the West Winch Growth Area. The WWHAR will alleviate pressure on the existing transport network and will also address current traffic problems on the A10 and A47 by providing an alternative route around the village.

Risks

2.10.23 The following risks have been identified for the WWHAR scheme and the associated mitigations proposed, as set out in Table 2.4. Further details of how these risks are managed can be found in Section 6.9 of the Management Dimension.

Table 2.4 – Highest rated strategic risks identified and mitigation, September 2023

Risk	Mitigation
Scheme may not meet DfT criteria on Value for Money (VfM) as the scheme shows no limited transport user benefits	▪ Ensure clear evidence for Land Value Uplift ▪ Establish dependent development using modelling evidence

Risk	Mitigation
The planning application and the housing applications may need to be considered together	▪ It is assumed that the WWHAR scheme can come forward with the Local Plan being approved
Fewer than the anticipated 4,000 homes may be delivered	▪ Sensitivity testing as part of the OBC

2.11 Conclusions

2.11.1 The preferred scheme design presented in Section 2.8 remains largely unchanged since the preparation of the SOBC in 2021. The scope of the scheme has been extended to include an additional wider package of sustainable transport measures to complement the WWHAR and encourage mode shift away from private car use for those travelling shorter distances within the study area. This addition reflects increased policy emphasis on carbon savings, climate change, and increased requirements for Biodiversity Net Gain.

2.11.2 The evidence base has been revisited and reconfirms the need for the scheme. Therefore, the OBC presents a strong case for change. The proposed WWHAR scheme is closely aligned with national, regional and local policies, plans and strategies and contributes to the Government's goal of levelling up communities, both on a national scale, and within Norfolk

2.11.3 The scheme is designed to not only support the delivery of 4,000 new homes but to address traffic problems on the existing A10 by providing an alternative route around the village of West Winch. This will ensure a well-connected highway network that can cope with an increase in demand.

2.11.4 Addressing existing congestion and connectivity challenges will create a more resilient network that offers access to opportunities for all as plans for 88,000 new jobs and 140,00 new homes by 2036 are realised.

2.11.5 The main problems that the proposed scheme aims to address are:

- **Housing Shortage** – housing demand is currently outpacing supply. Further, house prices increased by 13.2% over the period 2020 to 2021. This can negatively impact business efficiency and productivity, deterring investment and restricting growth.
- **Road Infrastructure** – The section of the existing A10 within the study area suffers from severance issues, barriers to walking and cycling, congestion, and road safety issues. Similarly, the A47 suffers from delays, particularly at the Hardwick Interchange pinch-point.

2.11.6 Without the delivery of the scheme, these problems are expected to get worse. Growth in Norfolk will come at a price of increased congestion and worsening environmental conditions, as well as a less resilient network overall.

2.11.7 The overall aim of the scheme is therefore to support local economic growth, improve the quality of life for local residents, promote an improved environment, and improve connectivity with the wider public transport network.

2.11.8 Stakeholder engagement has been key to the scheme's development, with workshops being held since 2019. Letters of support have been offered from local organisations and businesses. NCC will continue to build upon the initial stakeholder engagement undertaken to date, and on the relationships developed with businesses, residents, and all other interested parties as the WWHAR scheme progresses.

3 Economic Dimension

3.1 Introduction

3.1.1 The Economic Dimension sets out the impacts of the West Winch Housing Access Road (WWHAR) scheme, hereby referred to as the 'scheme', for the purposes of the economic appraisal. The economic appraisal is used to inform the assessment of Value for Money (VfM) offered by the scheme.

3.1.2 The impacts considered are not limited to those directly impacting the economy, nor those that can be monetised. The economic, environmental and social impacts of the scheme are all examined, using qualitative, quantitative and monetised information that is reflective of the stage of development of the scheme. In line with the DfT Value for Money Framework, in assessing VfM, all of these impacts are consolidated to determine the extent to which the scheme's benefits outweigh the costs.

3.2 Overview of Appraisal Methodology

Economic Assessment

3.2.1 The economic assessment identifies and appraises the impacts of the scheme to determine the overall VfM. It takes account of the costs of developing, building, operating and maintaining the scheme.

3.2.2 This chapter has been developed following the relevant guidance from the Department for Transport's (DfT) Transport Analysis Guidance (TAG) and the DfT's Value for Money Framework.

3.2.3 The DfT's Value for Money Framework sets out three levels of impacts of a transport proposal:

- Level 1 - Established Monetised Impacts - The method used for estimating the impact and its monetary value is accepted, well-researched, and tried-and-tested. These impacts form the initial Benefit Cost Ratio (BCR).
- Level 2 - Evolving Monetised Impacts - Some evidence exists to support the estimation of a monetary value but this is less widely-accepted, well-researched or tried-and-tested, these impacts form the adjusted BCR.
- Level 3 - Indicative Monetised Impacts & Non-Monetised Impacts - Monetary valuation methods are not considered sufficiently widely-accepted, well-researched or tried-and-tested to be definitive. The estimated magnitude of the impact is assessed on a seven-point scale.

These impacts can be used as switching values for the change in VfM categorisation.

3.2.4 This Economic Dimension is structured in line with these three levels of impacts.

3.2.5 It is the consideration of these three levels of impact which inform the overall VfM assessment. As set out in the Strategic Dimension, the housing development at the West Winch Growth Area (WWGA) site is dependent on the scheme to ensure there is capacity on the road network for the additional transport demand generated by new housing. The impacts associated with induced investment (in this case dependent development) are Level 3 impacts, and not considered within the initial or Adjusted BCR for the scheme. The value of the dependent development is therefore considered within the VfM assessment. Given the nature of the scheme, the majority of the benefits are achieved through unlocking the development site, with the scheme facilitating this.

3.2.6 Figure 3.1 shows an overview of the economic appraisal process that has been followed to inform the VfM assessment.

Appraisal Scenarios

3.2.7 As set out in TAG Unit A2-2, the assessment of dependent development requires the preparation of four scenarios P, Q, R and S, set out in Table 3.1.

3.2.8 Different scenarios have been modelled and compared to understand the impacts of the scheme. This approach was discussed with DfT throughout development to ensure that the various levels of impacts were considered appropriately. The Scenarios compared effects the scale of impact and whether it is beneficial or adverse.

3.2.9 The Scenarios compared for each element of the appraisal is set out within Section 3.4, where generally for the Level 1 impacts:

- The transport user benefits compare Scenarios P and S i.e. with and without the scheme and no dependent development demand in either scenario
- The environmental and social impacts compare Scenarios P and R i.e. with the scheme and with dependent development and without the scheme and without dependent development

Table 3.1 – Dependent development scenarios

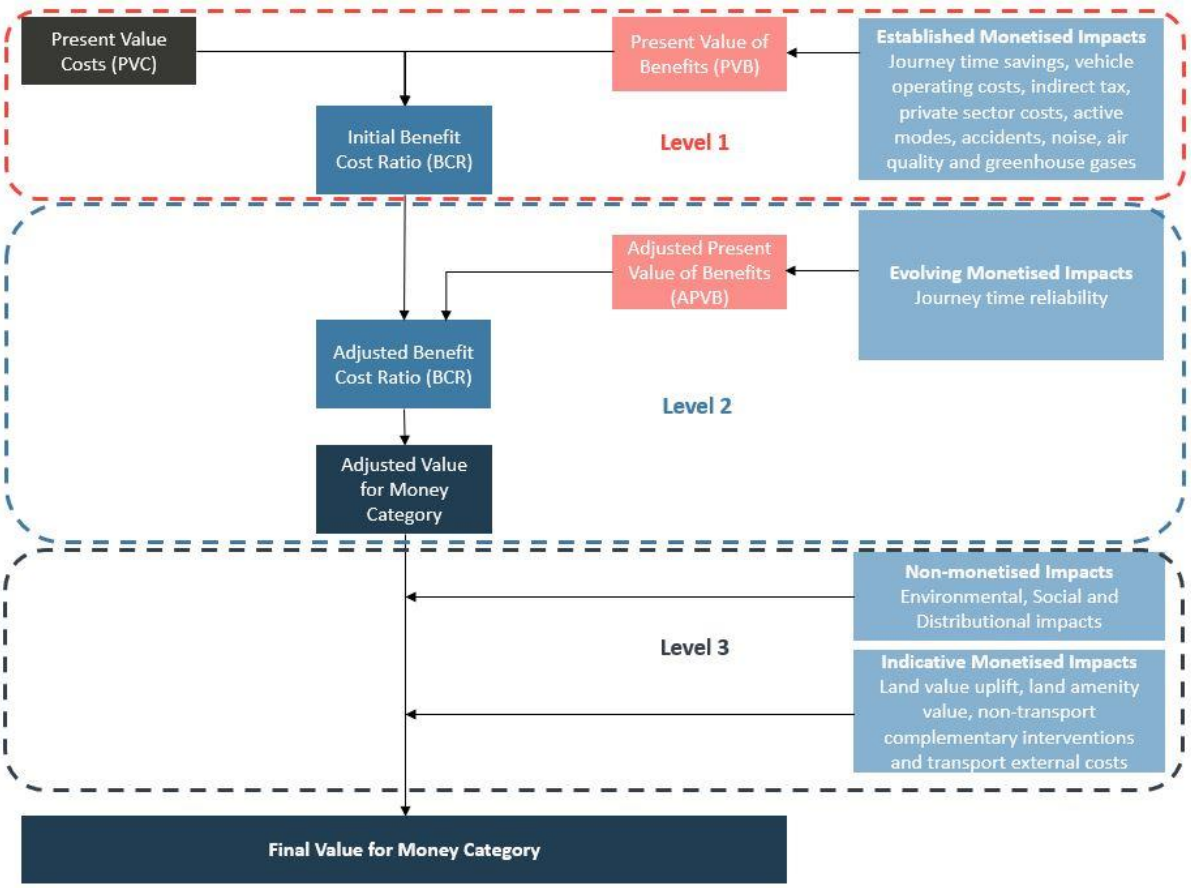
Scenario	Without dependent development	With dependent development
Without transport scheme	P	Q
With transport scheme	S	R

3.2.10 Within the appraisal, benefits have been considered over an appraisal period from scheme opening in 2027, and design and construction costs are considered prior to scheme opening excluding any sunk costs. The appraisal period reflects the asset life of the infrastructure and so for the highway elements of the scheme this is assumed to be 60-years. For the active mode measures a shorter period of 20-years has been used, this is based on guidance from DfT and Active Travel England (ATE). ATE guidance states an appraisal period of 40-years may be appropriate for dedicated cycling and walking infrastructure. A shorter period of 20-years has been used to reflect the demand uncertainty for the housing access road, this is discussed in more detail in paragraph 3.2.47.

3.2.11 A number of tools have been used to estimate the benefits associated with the scheme, these are discussed in the sections below. All costs and benefits within the appraisal are presented in the DfT's appraisal base year (2010) Present Values (PV) and in market prices (TAG Unit A1-1). Monetised impacts have been rebased to 2010 prices using Gross Domestic Product (GDP) Deflator forecasts from the TAG Data Book (May 2023 v1.21). Impacts have been converted to PV using social or health discount rates as set out in the TAG Data Book. Where required, impacts have been adjusted to market

prices from the factor unit of account using the adjustment factor in the TAG Data Book.

Figure 3.1 – VfM assessment process



Transport Modelling

3.2.12 This section provides an overview of the transport modelling approach used to appraise the scheme for the OBC. The Forecasting Report (70100518-WSP-GEN-WW-RP-TR-003 P01), Local Model Validation Report (70100518-WSP-GEN-WW-RP-TR-002 P01) and Data Collection Report (70100518-WSP-GEN-WW-RP-TR-001 P01) provide further detail of the approach and outputs of the transport modelling. The King's Lynn Transport Model (KLTM) has been used to assess the impact of the scheme on transport users.

3.2.13 The KLTM is a Highway Assignment Model (HAM) based in SATURN (Simulation and Assignment of Traffic to the Urban Road Network) version 11.5.05N MC. The KLTM has a base year of 2019, dictated by the Mobile

Network Data (MND) and traffic survey data collection which has been undertaken as part of the model build.

3.2.14 The KLTM has been updated in terms of generalised cost parameters, taking account of the TAG Data Book v1.20.2 (January 2023) in the formulation of Pence Per Minute (PPM) and Pence Per Kilometre (PPK) ratios derived from the latest information of Values of Time (VoT) and Vehicle Operating Costs (VOC).

Model Specification

Time Periods

3.2.15 The base year of the SATURN-based highway model associated with the KLTM is 2019. This base year is defined on the basis of the MND collected as part of the KLTM model build.

3.2.16 The model has been developed for the following time periods:

- AM Peak Hour: 08:00 – 09:00
- Average Interpeak Hour: 10:00 – 16:00
- PM Peak Hour: 17:00 – 18:00

User Classes

3.2.17 The following user classes have been utilised in the KLTM:

- User Class 1 – [HBW]: Car home-based work
- User Class 2 – [HBEmp]: Car home-based employer's business
- User Class 3 – [HBO]: Car home-based other
- User Class 4 – [NHBW]: Car non-home-based employer's business
- User Class 5 – [NHBO]: Car non-home-based other
- User Class 6 – [LGV]: all Light Goods Vehicles
- User Class 7 – [HGV]: all Heavy Goods Vehicles

Forecasting Methodology

Forecast Years

3.2.18 The following forecast years have been defined in the KLTM as part of the OBC appraisal of the scheme:

- 2027: Scheme opening year
- 2042: forecast year - 15 years after scheme opening

3.2.19 The scheme opening year has been set to 2027 based on the current scheme delivery timelines.

3.2.20 The future year of 2042 has been produced as this covers 15 years after the scheme has opened. It also represents a future year which is 5 years after the currently adopted King's Lynn and West Norfolk Local Plan and the Site Allocations and Development Management Policies (SADMP) which covers 2016 to 2036. The 2042 forecast year also represents a likely timeframe for when the full 4,000 dwellings will be delivered at the WWGA.

Forecast Scenarios

Dependency Testing

3.2.21 Traffic modelling has been conducted to understand the level of dependency of housing on scheme delivery. This has been used to establish deadweight housing and dependent development for the purposes of the economic appraisal under assumptions of land use change.

3.2.22 Table 3.2 outlines scenarios used for the test of dependency bringing together information on the housing development and forecast growth in road traffic. Further detail on planning assumptions and background growth in road traffic is provided in the model *Forecasting Report* (70100518-WSP-GEN-WW-RP-TR-003 P01). To test for dependency, all housing development traffic is loaded onto the existing network in the years 2027 (opening year) and 2042 (forecast year) in increments to define Scenario P at a point where network level of service is acceptable.

Table 3.2 – Dependent development scenarios

Scenario	West Winch Growth Area	WWHAR	NTEM 8.0 constraint
Scenario Q	4,000 dwellings	Not included	Applied at Norfolk level
Baseline scenario	0 dwellings	Not included	No change from Scenario Q, with the only matrix change is the removal of WWGA trip ends
Scenario P	Defined based on modelling outputs from Scenario Q and Baseline scenario	Not included	Applied at Norfolk level

3.2.23 The modelling inputs of interest to the dependency test include Volume to Capacity (V/C) ratios or percentages on links along the A10 between the A47 Hardwick Interchange and the A10/A134 roundabout, and the mean delay (in seconds) at junctions.

Reasonable Level of Service

3.2.24 As outlined in TAG Unit A2-2, in the context of testing for the dependency which a development has on a complementary transport scheme, there is 'no precise definition of reasonable level of service, such that decisions about dependency are judgement based'.

3.2.25 For the dependency testing a 'reasonable level of service' is defined as the threshold up to which the A10 can be considered to be operating at an acceptable level of network performance. Beyond this threshold, the network performance of the A10 would be considered to be unacceptable, and no additional housing development could be accommodated until the scheme is in place.

3.2.26 The main body and Appendix A of the Forecasting Report (70100518-WSP-GEN-WW-RP-TR-003 P01) provides explanation and analysis of the modelling undertaken to test for the dependent development threshold.

Establishing Dependent Development

3.2.27 The dependency tests undertaken show that the A10 is likely to be operating close to capacity by the 2027 opening year even without any additional housing. Incremental testing, whereby additional housing is loaded onto the network, found that the deadweight housing to be applied is 300 homes. Beyond this point, the network, specifically the A10, cannot accommodate any additional traffic from future development without users suffering from a deterioration in the level of service.

3.2.28 As further development generated traffic is loaded onto the network, there are a range of wider network impacts that start to emerge, including:

- Re-routing to avoid significant congestion at the northern end of the A10 near to the Hardwick Interchange and WWGA access junction. This would significantly reduce the functionality of the A10 as a strategic route to access King's Lynn.
- Re-routing of traffic onto unsuitable routes (Rectory Lane, Chequers Lane, Setch Road) as traffic seeks alternative routes to access the A47.
- Increases in delay on the A10 on the approach to the A10/Rectory Lane junction due to a significant increase in right turning traffic from the A10 northbound.

3.2.29 For the purposes of the economic appraisal, it has been assumed that 300 homes can come forward without the scheme, and 3,700 are dependent on the delivery of the scheme. For the transport modelling, the scenarios shown in Table 3.1 are defined as follows:

- Scenario P: 300 homes, without scheme

- Scenario S: 300 homes, with scheme
- Scenario Q: 4,000 homes, without scheme
- Scenario R: 4,000 homes, with scheme

Forecast Demand

3.2.30 The DfT released in March 2023 the guidance "Forthcoming Change: accounting for COVID-19 in transport modelling", which has now been officially incorporated into TAG M4 Appendix B (May 2023). This appendix acknowledges that COVID-19 has had a significant impact on travel patterns and volumes, and these have remained after the ease of lockdown measures. The document provides guidance on the impact of COVID-19 in transport models and how to account for it in calibrated models with base years prior to the pandemic. The guidance suggests a proportionate approach to accounting for COVID-19 impact and suggests three potential approaches:

- Creating a forecast to the present day based on observed data
- Applying adjustments to a forecast year model
- Applying the adjustment globally to model results

3.2.31 An October 2022 traffic data collection exercise encompassing all of the Automatic Traffic Count (ATC) locations and MCTC locations from the 2018/19 survey has been undertaken in order to understand the change in traffic levels which have occurred in the King's Lynn area post-COVID-19.

3.2.32 Given that a post COVID-19 survey has been undertaken at the same locations as the pre-COVID-19 survey, all the three potential approaches highlighted in TAG M4 are available. However, the second approach which applies adjustments to the forecast year models has been deemed the most proportionate approach for this assessment. Following this approach, the 2019 base year model has been maintained, a factor between 2019 and 2022 has been calculated by time period from the survey data used for the model screenlines and applied globally to all car user classes in the base year

matrices to take into account the impact of COVID-19. Table 3.3 shows the factors used to adjust the base year matrix for the COVID-19 impact. Further analysis has been undertaken on time periods (rather than peaks) and daily flows to ensure a similar pattern is observed across these periods as well.

Table 3.3 – 2019 to 2022 COVID 19 adjustment factors

Year	AM	IP	PM
2019 – 2022 factor	0.954	0.926	0.902

3.2.33 Growth between 2022 and the forecast years for the assessment (2027 and 2042) has been taken from NTEM v8.0 core scenario.

3.2.34 LGV and HGV growth has not been adjusted for COVID-19 and was taken directly from National Road Traffic Projections (NRTP) 2022. This is to reflect as part of NRTP 2022 analysis it was found that the level of LGV and HGV traffic did not substantially change as a result of COVID-19.

3.2.35 In May 2022 the DfT announced fundamental changes to TAG which have implications for how forecast demand in traffic models should be derived, ensuring a greater appreciation and consideration of uncertainty. The Uncertainty Toolkit (May 2023) presents the release of six new “Common Analytical Scenarios (CAS)” in an effort to deviate from an exclusive focus on a core scenario and a more prominent consideration of “what if” scenarios. The Toolkit provides practical advice on the analysis of uncertainty and guidance on the proportionality of the uncertainty analysis required. The proportionality of the uncertainty analysis required is based on the impact and the level of the uncertainty.

3.2.36 The impact of the uncertainty is determined by several factors such as the financial cost, scale of the project and corporate risk, and is classified it into a Low, Medium and High scale as set out in Table 1 of the Toolkit. The scheme has been assumed to be in the Medium impact category as the cost is likely to be higher than £50m and there is a limited corporate risk.

3.2.37 Table 2 of the Toolkit describes DfT’s recommended proportionate approach to scenarios analysis based on the business case stage and impact level. For

a Medium impact scheme at OBC stage, the recommended scenarios to be run are the critical Common Analytical Scenarios. However, TAG M4 emphasises that the scenarios chosen are at least as stretching as High and Low growth scenarios. Analysis has been carried out to understand the range of demand growth provided by the different CAS, demonstrating that these all fall within the range between High and Low growth scenarios. Further detail on this analysis can be found within the Forecasting Report (70100518-WSP-GEN-WW-RP-TR-003 P01). Therefore, for the purposes of the OBC the following uncertainty scenarios have been considered:

- Core Scenario
- High Growth Scenario (based on national uncertainty adjustments to the Core Scenario)
- Low Growth Scenario (based on national uncertainty adjustments to the Core Scenario).

Active Mode Appraisal

3.2.38 A shared use path is being delivered as part of the scheme, providing a dedicated facility for pedestrians and cyclists segregated from general traffic. In line with TAG Unit 5-1, the DfT's Active Mode Appraisal Toolkit (AMAT) has been used to assess the benefits and costs of proposed walking and cycling interventions that form part of the scheme. In this assessment it is not possible to quantify the impacts of some elements of the scheme i.e., crossings/junction's treatments. The AMAT captures the impacts of the scheme in terms of journey quality to active mode users, health impacts from more people travelling by cycling or walking and decongestion impacts associated with modal shift from private car. Active mode impacts have been considered over a 20-year period from scheme opening year in 2027.

3.2.39 The AMAT requires inputs in terms of existing and anticipated demand, as well as changes in infrastructure provision, to evaluate these benefits. The AMAT combines the benefits linked to the intervention with a set of assumptions from the National Travel Survey (NTS) concerning travel

distance, travel speed, distribution of travel purposes, and factors affecting the diversion from other modes.

3.2.40 The AMAT estimates the benefits based upon a comparison of the existing infrastructure and the proposed infrastructure. Within the tool, the options that can be selected to capture this before and after state for cycling infrastructure are:

- No provision
- Shared bus lane
- Wider lane
- On-road non-segregated cycle lane
- On-road segregated cycle lane
- Off-road segregated cycle track

3.2.41 For pedestrian infrastructure the infrastructure selections are:

- Street lighting
- Kerb level
- Crowding
- Pavement evenness
- Information panels
- Benches
- Directional signage

3.2.42 As the impacts of the shared use path are largely environmental and social, the active mode appraisal has been based on a comparison of Scenarios P and R, such that:

- Scenario P: 300 homes on WWGA, without scheme

- Scenario R: 4,000 homes on WWGA, with scheme

3.2.43 Under Scenario P it has been assumed that there is no current provision in terms of walking and cycling infrastructure, whilst under the Scenario R it is assumed that there is an off-road segregated cycle track.

3.2.44 The AMAT assessment focuses on new users as the level of current cycling trips is close to zero. Under Scenario P it is assumed there will be current trips associated with the deadweight housing only, under Scenario R it is assumed that there will be trips associated with the housing site.

Existing and Scheme Induced demand

3.2.45 Trip rates and information from the TRICS database on Average Annual Daily Flows (AADF) per household, assuming different mode shares, has been calculated to estimate the additional trips generated by new housing at the WWGA as shown in Table 3.4. Trip rates per household for walking and cycling have been calculated by multiplying the mode split percentages for the WWGA by the total trips per household for all user classes (8.149). This provides a basis for calculating additional walking and cycling trips per additional household delivered at the WWGA.

Table 3.4 – TRICS Database – Trip rates per household and mode share

User Class	Mode Share Census 2011	Mode Share WWHAR	Trip rates Per Household
Total	**100%**	**100%**	**8.149**
Car driver	67%	57%	4.679
Car passenger	4%	5%	0.419
Motorcycle	1%	1%	0.105
Cycle	**9%**	**13%**	**1.059**
Pedestrian	**15%**	**19%**	**1.572**
Train	1%	1%	0.105
Bus	2%	3%	0.210

3.2.46 Average Annual Daily Trips (AADT) for walking and cycling are calculated for the full development quantum (4,000 homes) by simply multiplying the trip

rate per household by the number of additional units. This has been calculated for the dependent development and deadweight proportion of the WWGA development. The results are shown in Table 3.5.

Table 3.5 – AADTs for dependent development and deadweight housing quantum

User Class	AADT 4,000 homes	AADT 300 homes	AADT 3,700 homes
Total	**32,596**	**2,445**	**30,151**
Car driver	18,716	1,404	17,312
Car passenger	1,677	126	1,551
Motorcycle	419	31	388
Cycle	**4,237**	**318**	**3,920**
Pedestrian	**6,289**	**472**	**5,817**
Train	419	31	388
Bus	838	63	776

3.2.47 Within the AMAT assessment it has been assumed that 50% of the cycle and walking trips to/from the development would use the shared use path on the housing access road, with the remainder of trips accessing by more minor entrances and exits on the perimeter of the site. At this stage detailed analysis of the trip distribution to/from the site has not been undertaken, and therefore this 50% assumption has been used to reflect that not all the residents will utilise the shared use path. This assumption will be refined at later business case stages to reflect the latest understanding of origins and destinations and resultant trip patterns. Applying this assumptions gives the following pedestrian and cycle demand for the two scenarios:

- Scenario P:
  - Daily cycle trips: 159
  - Daily pedestrian trips: 236
- Scenario R:

- Daily cycle trips: 2,119
- Daily pedestrian trips: 3,144

Sustainable Transport Strategy

3.2.48 As part of the development of the OBC, a Sustainable Transport Strategy (STS) has been prepared, as detailed in. The STS identifies a complementary package of sustainable travel measures facilitated by the scheme, which enhance sustainable access for existing residents of West Winch whilst also accommodating the future growth at the WWGA. The STS considered the existing transport conditions across all modes to understand where measures were needed, and then an extensive option development and assessment process which considered active travel, bus improvements, micromobility, hubs, rail improvements and traffic calming. A multi-criteria assessment framework was used to assess the long-list options and identify those suitable to be taken forward to short-listing. Throughout the process there was engagement with key stakeholders, with a workshop held in March 2023.

3.3 Scheme Costs

3.3.1 This section details the various costs associated with delivering the scheme. The Financial Dimension sets out in more detail the development and underlying assumptions that underpin the cost estimates for the scheme.

Capital Expenditure

3.3.2 The costs of developing and delivering the scheme have been estimated using the preliminary design information at this OBC stage. This estimate considers the construction costs, professional fees, utilities, and land costs of the scheme. A risk adjustment has been applied to the costs to reflect future uncertainty and costs have been inflated to the year in which they are incurred. The Financial Dimension includes further detail of the approach to cost estimation to inform the OBC. Within the appraisal, the costs incurred to date have been considered as sunk costs and therefore have not been included.

3.3.3 For a road scheme at the OBC stage, TAG Unit A1-2 states that 23% optimism bias should be applied to the base costs. The guidance states that this level of optimism bias is also applicable to active mode schemes. A comparison was made between the base costs adjusted for optimism bias and the risk-adjusted scheme costs to ensure that the scale of costs under these two approaches was similar.

3.3.4 Table 3.6 shows a comparison between the risk-adjusted base cost and optimism bias adjusted base cost. It can be seen that the costs are similar. In line with TAG Unit A1-2, the larger of the two costs (the risk adjusted cost) has been used within the economic appraisal.

Table 3.6 – Risk and optimism bias cost adjustments (£m, nominal)

Cost	**Risk adjustment**	**Risk adjustment**	**Optimism bias adjustment**	**Optimism bias adjustment**
Base cost	**Risk**	**Risk-adjusted base cost**	**Optimism bias**	**Optimism bias adjusted cost**
65.53	15.63	81.16	15.07	80.60

3.3.5 Within the appraisal, costs have been adjusted to 2010 PV, market prices. Table 3.7 below shows the adjustments made to the capital costs within the economic appraisal, and the detail of these calculations are included within Appendix G (refer to separate document).

Table 3.7 – Economic appraisal cost adjustments

Capital expenditure pre-risk adjustment (£m, nominal)	**Risk adjustment cost (£m, nominal)**	**Deflate to 2010 prices (£m, 2010)**	**Discount to 2010 values (£m, 2010 PV)**	**Adjust to market prices (£m, 2010 PV, market prices)**
65.53	81.16	58.96	34.91	41.54

3.3.6 Within the economic appraisal costs incurred by the private sector have been subtracted from the Present Value of Benefits, and the costs to the public

sector form the Present Value of Costs. This is in line with the guidance in TAG Unit A1-2.

Maintenance and Renewal Costs

3.3.7 There will be additional maintenance and renewal costs of the highway infrastructure as a result of the scheme. These additional costs are assumed to be incurred from scheme opening over the appraisal period. These costs have been assumed to grow in line with general inflation, and within the economic appraisal have been adjusted for optimism bias and converted to 2010 PV market prices following the same approach as for the capital expenditure.

3.3.8 Over the appraisal period, the additional maintenance and renewal costs are estimated to be £2.4m (2010 PV, market prices). These costs are assumed to be met by NCC.

3.4 Benefits Assessment and Results

Level 1 Impacts – Established Monetised Impacts

3.4.1 This section sets out the methodology undertaken and resultant outputs when considering the established monetised impacts of the scheme. The following impacts have been quantified and monetised within the appraisal:

- Transport user benefits
  - Journey time impacts
  - Vehicle operating cost impacts
- Indirect tax impacts
- Environmental impacts
  - Noise
  - Air quality
  - Greenhouse gases

- Social impacts
  - Physical activity
  - Journey quality
  - Accidents

Transport User Benefits

3.4.2 In line with TAG Unit A2-2, the consideration of the level 1 transport user benefits are based the impacts of the transport scheme itself. This has been assessment by comparing the following scenarios:

- Scenario P: without the dependent development and without the transport scheme
- Scenario S: without the dependent development and with the transport scheme

3.4.3 The principles behind the valuation of transport user benefits have been based upon monetising the scheme changes in:

- Travel time impacts for highway users
- Vehicle operating costs met by the users

3.4.4 The DfT's Transport User Benefit Appraisal (TUBA) and outputs from the KLTM have been used to monetise changes in highway user journey times and vehicle operating costs.

Travel Time

3.4.5 TUBA calculates the benefits of travel time savings by comparing travel times in the Do Minimum scenario to those in the Do Something scenario for each time period. These time savings are then assigned financial valuations (Values of Time (VOT)) to determine the monetary benefits.

3.4.6 The appraisal uses the latest version of TUBA available at the time of undertaking the appraisal which utilises the economic parameter file version

1.9.21.0 based on TAG Data Book v1.21 (May 2023). The outputs from TUBA are in 2010 PV market prices over the appraisal period.

3.4.7 The detailed outputs from TUBA are included in Appendix H (refer to separate document).

Annualisation

3.4.8 Within TUBA, annualisation factors have been used to expand from modelled time periods to annual impacts. These factors are shown Table 3.8 and are calculated based on local ATC data in 2022 that has been adjusted in some instances to reflect the impact of COVID-19.

3.4.9 The AM and PM annualisation factors are derived from relating an average peak hour traffic flow to an average peak period flow in order to derive a peak hour to peak period factor. Here the peak periods are 0700 – 1000 and 1600 – 1900. These have then been related to the 253 working days per calendar year as follows.

- AM Peak hour (Mon – Thurs) to peak period (Mon – Fri) factor equals 2.705
    - 253 x 2.705 = 684
- IP average period (Mon – Thurs) to average period (Mon – Fri) factor equals 1.036
    - 253 x 6 x 1.036 = 1,572
- PM Peak hour (Mon – Thurs) to peak period (Mon – Fri) factor equals 2.808
    - 253 x 2.808 = 711

3.4.10 These annualisation factors have been used for all highway impacts given that the ATC data captures all traffic movements for different user classes within the KLTM.

3.4.11 These annualisation factors do not capture the impacts during the evenings and weekends as there are not models for these time periods.

Table 3.8 – Annualisation factors

Time period	Peak hour to peak period/average period factor	Number of days	Annualisation factor
AM Peak (0800 – 0900)	2.705	253	684
Inter-peak (1000 – 1600)	1.036	253	1,572
PM Peak (1700 – 1800)	2.808	253	711

3.4.12 In addition to the highway impacts captured in the KLTM, the AMAT also forecasts a decongestion impact due to modal shift to active modes from private car.

3.4.13 Table 3.9 shows the travel time impacts over the appraisal period as a result of the scheme.

Table 3.9 – Travel time impacts

Travel time impacts	£m, 2010 PV over appraisal period
Travel time impact (KLTM)	0.16
Travel time impact (AMAT)	0.21
Total	**0.37**

3.4.14 Table 3.10 below shows the breakdown of journey time benefits captured in the KLTM by time period, and Table 3.11 then shows the disaggregation by user class.

3.4.15 The scheme seeks to remove through traffic from West Winch village and divert it onto the housing access road. Through the improved design and higher speeds, use of the access road provides journey time savings to some users compared to the existing A10. However, the scheme is unlikely to result in substantial journey time savings given the length of the housing access road compared to the existing A10 and the traffic calming measures

implemented on the A10. For some through traffic switching to use the scheme this may lead to longer journey times than using the current A10, in particular when combined with the additional roundabouts/development site access points. Further, integrating the housing access road with the A47 requires the introduction of a roundabout, the impact of this on through traffic on the A47 will counteract some of the benefits generated through the dualling of the A47 as part of the scheme. This can be seen through the negative travel time impact on business users.

3.4.16 There is a notable congestion benefit in the AM Peak as in the Do Minimum scenario the A10 northbound is more much more congested than other time periods, therefore the scheme alleviates some of this congestion through diversion of through traffic onto the WWHAR and the A47. In the PM peak there is less of a congestion issue in the Do Minimum scenario, and the access road becomes congested for the section between the A47 and Hopkins Homes roundabout. Therefore, there are negative travel time impacts in the PM peak.

Table 3.10 – Travel time impacts by time period

Travel time impact (KLTM)	**£m, 2010 PV over appraisal period**
AM peak	0.54
Interpeak	0.52
PM peak	-0.90
Total	**0.16**

Table 3.11 – Travel time impacts by user class

Travel time impact (KLTM)	**£m, 2010 PV over appraisal period**
Car - Business	-0.03
Car – Commuting	0.69
Car – Other	0.19
LGV personal – Other	-0.02
LGV freight – Business	-0.39

Travel time impact (KLTM)	£m, 2010 PV over appraisal period
OGV1 – Business	-0.11
OGV2 - Business	-0.18
Total	**0.16**

3.4.17 The Transport Benefits Technical Note included in Appendix I (refer to separate document) and the Forecasting Report include further detail of the spatial disaggregation of the impacts of the scheme, and this is also considered within the Place-Based Analysis discussed in Section 3.8.

Impacts During Construction

3.4.18 A single year (2027) economic assessment was carried out to understand the disbenefits during construction. TUBA was used to estimate the monetised impacts resulting from changes in journey times which will occur during the construction phase. Two additional KLTM highway assignments were created to inform the TUBA assessment.

3.4.19 Firstly, a scenario was modelled which included a speed reduction to 30mph on the A47 starting to the east of where the proposed A47 / WWHAR roundabout will be located, encompassing all of the A47 up to the Hardwick interchange, including the A47 flyover and A47 East slip roads to/from the satellite Constitution Hill roundabout. In addition to this, specific movements currently allowed between the A47 flyover and A47 Constitution Hill roundabout were banned. This scenario was modelled in the AM peak, Interpeak and PM peak, making the assumption that east-west connectivity on the A47 could be maintained throughout the construction period.

3.4.20 Secondly, total closure of the A47 between Hardwick Interchange and New Road was modelled in the Off-peak period to represent the fact overnight closures would be permitted by National Highways during the construction period.

3.4.21 The two additional modelled scenarios were than compared to the respective post-VDM 2027 Scenario P highway assignments from the Core Scenario,

therefore a scenario without the scheme and without the dependent development at the WWGA.

3.4.22 The disbenefits for the AM, Interpeak and PM utilised the annualisation factors outlined in Table 3.8. An annualisation factor of 1,518 (3036 / 2) was applied to the Off-peak assessment to represent the assumption that overnight closures would be permitted across 50% of the year. The TUBA assessment was run for a single year with the outturn result than doubled, making the assumption the construction disbenefits modelled on the A47 would occur for a two year period during the construction phase of the development.

3.4.23 Over the assumed two-year period, a total disbenefit of £1.29 million (2010 PV) is generated. Table 3.12 shows a summary of the disbenefits by modelled time period. The table below combines time, fuel VOC, non-fuel VOC and indirect tax benefits.

Table 3.12 – Construction disbenefits

Travel time impact (KLTM)	**£m, 2010 PV over appraisal period**
AM peak	-0.36
Interpeak	-0.35
PM peak	-0.32
Off-peak	-0.26
Total	**-1.29**

3.4.24 The Transport Benefits Technical Note included in Appendix I (refer to separate document) provides a more detailed breakdown of the construction disbenefits which have been produced. This includes analysis of the spatial distribution of the disbenefits. The spatial distribution of the construction disbenefits demonstrates expected impacts local to the scheme but also locations in external sectors. This is expected given the A47 is part of the SRN and will have a mixture of short and long distance trips travelling along it.

Vehicle Operating Costs

3.4.25 The changes in VOCs are as a result of variations in costs related to fuel, maintenance, and wear and tear, which are influenced by alterations in speed and distance due to the scheme.

3.4.26 Table 3.13 shows the VOC impacts over the appraisal period as a result of the scheme.

Table 3.13 – VOC impacts

VOC Impacts	£m, 2010 PV over appraisal period
VOC - fuel	-0.75
VOC – non-fuel	-0.37

3.4.27 The scheme reduces travel speeds on the A10 through speed limit restrictions from 40mph to 20/30mph and the installation of additional signalised pedestrian crossings. Similar to the journey time impacts, this means that it takes longer to travel along the A10 with the scheme in place, increasing the VOC incurred. In addition, the housing access road itself attracts strategic traffic which previously travelled through West Winch; however this route is longer than the current A10 with a number of roundabout stop-lines.

Indirect Tax

3.4.28 The change in indirect tax revenues to central Government was captured within the appraisal. For the appraisal of the scheme, the change in tax revenues considered the changes in tax revenues generated through changes in fuel and non-fuel vehicle usage by highway users. TUBA was used to estimate the indirect tax impacts of the scheme captured in the KLTM, and the AMAT captured the indirect tax impacts of mode shift to active modes from private car.

3.4.29 Table 3.14 shows the impact of the scheme on indirect tax revenues to central Government, split by those estimated in TUBA and those from AMAT.

Table 3.14 – Indirect tax impacts

Indirect tax impacts	£m, 2010 PV over appraisal period
Indirect tax impact (KLTM)	0.08
Indirect tax impact (AMAT)	<0.01
Total	**0.08**

Environmental impacts

3.4.30 The environmental appraisal has been undertaken in line with TAG Unit A3, in an approach proportionate to the stage and scale of the scheme. In accordance with TAG Unit A2-2 and discussions with the DfT, the environmental assessment has been carried out based on the comparison of the following scenarios:

- Scenario P: without the dependent development and without the transport scheme
- Scenario R: with the dependent development and with the transport scheme

3.4.31 It is noted that through comparing these scenarios the appraisal is capturing the impacts of the additional travel demand as a result of the development. This additional volume on the transport network is therefore going to have an adverse impact on environmental indicators. For a traditional transport scheme, the Level 1 impacts would usually be considered under fixed land use i.e. no change in demand between scenarios, and therefore if these scenarios were compared here the impacts wouldn't be of the same magnitude.

Noise

3.4.32 The noise appraisal has been completed in accordance with TAG Unit A3 guidance on noise impacts. The methodology references the Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration guidance where appropriate, however, this is not a full and complete assessment under DMRB

LA 111, as a proportionate appraisal has been undertaken, with the scope and methodology being tailored to support the OBC.

3.4.33 With regards to noise impacts, TAG Unit A3 impact appraisal previously focused on annoyance, however, this has shifted in light of growing evidence in the links between environmental noise and health outcomes. DEFRA has produced guidance on transport-related noise using an 'impact pathway' approach that includes:

- Annoyance
- Sleep disturbance
- Health impacts, including heart disease (acute myocardial infarction, or AMI), stress and dementia

3.4.34 These impact pathways are reflected in the TAG workbook, with financial values assigned to each based on noise levels predicted with and without the scheme. The TAG methodology includes five steps as follows:

- Scoping
- Quantification of noise impacts
- Estimation of the affected population
- Monetary valuation of the changes in noise
- Consideration of the distributional impacts of changes in noise.

3.4.35 The key stage in the quantification of noise impacts whereby noise levels are predicted at each 'receptor' within the study area. In order to quantify noise level changes at each property, receptor specific noise level calculations have been undertaken for the following scenarios.

- Scenario P in the 2027 forecast year
- Scenario R in the 2027 forecast year
- Scenario P in the 2042 forecast year

- Scenario R in the 2042 forecast year

3.4.36 Noise levels are calculated at every façade of each residential building in the study area. The façade subject to the greatest magnitude of change has been used in the analysis in line with the guidance in DMRB LA 111. Noise levels have been calculated in the 3D modelling software CadnaA adopting the methodology set out within the Calculation of Road Traffic Noise (CRTN) document.

3.4.37 The study area has been derived based on guidance within DMRB LA 111 to be an area 600m from the scheme and any roads bypassed by the project, which in this case includes the A10 between the scheme extents. This ensures that the noise level benefits which are anticipated along the A10 are included in this appraisal.

3.4.38 Existing residential receptors within the study area have been identified using OS AddressBase® data. A total number of 1,366 dwellings are located within the main study area and have, therefore, been included within the assessment.

3.4.39 It has been assumed that the scheme will be surfaced with a low noise road surface type, although, as the design speed of the scheme is 40mph (64kph) for large sections, the benefits of the low noise road surface are not accounted for in the noise calculations for these sections (DMRB LA 111 advises that corrections should only be applied for a low noise road surface where the road speed is greater than 75kph). Where the road speed is above the 75kph threshold, the appropriate corrections for a low noise surface have been applied.

3.4.40 The results of the noise appraisal are summarised below. These have been generated by analysing data for each residential receptor based on the façade with the greatest magnitude of noise change:

- In the forecast year, 245 households would experience an increase in daytime noise, whilst 670 households would experience a decrease in daytime noise.
- In the forecast year, 60 households would experience an increase in night-time noise, whilst 239 households would experience a decrease in night-time noise.
- The impact pathways described earlier in this section have been assessed, and the scheme is likely to generate a beneficial effect for all pathways. The following net present values have been calculated:
  - Sleep disturbance: £1.07m
  - Amenity: £1.08m
  - AMI: £0.29m
  - Stroke: £0.09m
  - Dementia: £0.14m

3.4.41 The overall appraisal indicates that the operation of the scheme is likely to generate a beneficial noise impact, with £2.68m (2010 PV) benefits over the appraisal period.

3.4.42 Paragraph 2.2.7 of TAG Unit A3 states ‘As well as through the monetisation process described in step three below, night noise impacts should be assessed by determining the number of households where the WHO Interim Night Noise Target of 55 dB L_{night} noise level is exceeded for the last forecast year in the with and without scheme cases’.

3.4.43 In the Scenario P forecast year, 118 receptors are predicted to exceed the target value of 55 dB L_{night}. In the Scenario R forecast year, 34 receptors are predicted to exceed the target value of 55 dB L_{night}.

3.4.44 The scheme proposes significant improvements to walking and cycling infrastructure as part of the new development at the WWGA. The scheme will

provide off-road segregated cycle and walking infrastructure. Pedestrian facilities will also be improved along routes and at crossings at the A10 which borders the development.

3.4.45 Impacts from the walking and cycling infrastructure are quantified using the AMAT, which captures noise impacts from a reduction in car kilometres. The overall impact of the active mode measures is valued at <£0.01m (2010 PV) from a reduction in noise originating from modal shift away from motorised transport.

3.4.46 Table 3.15 shows the noise impacts of the scheme.

Table 3.15 – Noise impacts

Noise Impacts	**£m, 2010 PV over appraisal period**
Noise impact (KLTM)	2.68
Noise impact (AMAT)	<0.01
Total	**2.68**

Air Quality

3.4.47 The study area for the air quality assessment has been determined by defining the affected road network (ARN) using DMRB LA 105 scoping criteria (National Highways (2020) LA 105, which is available to download via the Standards for Highways website):

- Change in annual average daily traffic (AADT) flow of 1,000 vehicles or more; or
- Change in AADT flow of heavy duty vehicles of 200 or more; or
- Change in road alignment of 5m or more.

3.4.48 The ARN extends from the A149/A148 junction to the north east of King's Lynn, down to the A47 south of King's Lynn and A10 through West Winch to Setchey. The study area extends 200m around the ARN. All impacts beyond 200m will be imperceptible and have been scoped out.

3.4.49 The data sources used in this appraisal comprise:

- Borough Council of King's Lynn and West Norfolk 2023 Air Quality Annual Status Report (ASR), which is available to download from the West Norfolk website
- Traffic data for scenarios without and with Scheme in 2027 (opening year) and 2042 (design year)
- Road source emissions data from DEFRA's 2021 Emissions Factors Toolkit (version 11.0), which is available to download from DEFRA's website
- Meteorological data for Marham 2019 – used in predicting pollutant concentrations at receptors
- Background and roadside pollutant concentration data from DEFRA's 2018-based Pollution Climate Mapping (PCM) model, which is available to download from DEFRA's website, as well as Defra (2020) NO_2 and PM projections data (2018 reference year) – which is also available to download from Defra's website
- Conversion of modelled oxides of nitrogen (NO_x) concentrations to nitrogen dioxide (NO_2) concentrations using Defra's NO_x to NO_2 calculator (version 8.1), which is available to download from DEFRA's website
- Ordnance Survey AddressBase data to identify sensitive receptor locations with relevant exposure to annual mean pollutant concentrations.

3.4.50 The appraisal has been undertaken following TAG Unit A3 guidance on Air Quality Impacts and has involved:

- Quantitative assessment based on modelling to determine vehicle emissions of NOx and fine particulate matter (PM2.5) with and without the scheme in the opening and design years, and dispersion modelling to determine road contributed annual mean concentrations of NOx and

PM2.5 at relevant receptors in the scenarios. Concentrations have been predicted by dispersion modelling using ADMS-Roads model software .

- Monetary valuation of the air quality impacts has been undertaken using the impact pathways approach, which accounts for changes in human exposure to annual mean NO2 and PM2.5 concentrations at relevant receptors and overall emissions of NOx and PM2.5 to determine the effects of impacts that do not directly affect households such as ecosystem damages.

3.4.51 In order to quantify air quality impacts as a result of the Scheme at each property in the study area, air quality appraisals have been undertaken for the following scenarios:

- Scenario P in the 2027 forecast year
- Scenario R in the 2027 forecast year
- Scenario P in the 2042 forecast year
- Scenario R in the 2042 forecast year

3.4.52 The assessment shows a net benefit in local ambient air quality with respect to NO2 and PM2.5 as a result of the scheme in both the scheme opening year and 2042 forecast year. However there is an adverse impact derived from 'other impacts (NOx), which, when the impacts are extrapolated over 60-years and monetised, leads to an overall disbenefit in terms of air quality. It is noted that there is no guidance/methodology to calculate 'other impacts' for PM2.5. Over the 60-year appraisal period the monetised air quality impact is estimated to be -£0.05m (2010 PV). The detailed TAG Worksheet for air quality is included in Appendix J (refer to separate document).

3.4.53 Impacts from proposed walking and cycling infrastructure are quantified using the AMAT, which captures changes to local air quality from a reduction in car kilometres. The overall scheme impact is valued at <£0.01m (2010 PV) from

improvements in local air quality and a reduction in the amount of pollutants emitted.

3.4.54 Table 3.16 shows the air quality impacts of the scheme.

Table 3.16 – Air quality impacts

Air Quality Impacts	£m, 2010 PV over appraisal period
Air quality impact (KLTM)	-0.05
Air quality impact (AMAT)	<0.01
Total	**-0.05**

Greenhouse Gases

3.4.55 The impact of the scheme on greenhouse gas emissions is dependent on changes in traffic flows, fleet composition, speeds and distance travelled. Any increase in the traffic (and subsequent increases in fuel consumption) from the scheme results in a net increase in carbon emissions and therefore greenhouse gas emissions.

3.4.56 End-user vehicle emissions have been calculated in accordance with the 2019 Highways England DMRB LA 114. Emissions were quantified using the TAG Data Book (v1.21, May 2023). For the purposes of the OBC, the DfT Greenhouse Gases Workbook as per TAG Unit A3 was used to assess impacts over a 60-year appraisal period. This calculates and evaluates the changes in tonnes of carbon emissions for non-traded (e.g. petrol, diesel and fuel oil) and traded (e.g. electricity) fuel consumption. Table 3.17 shows the carbon emissions over the 60-year period for Scenarios P and R.

Table 3.17 – Carbon emissions by scenario

Emissions class	60-year carbon emissions (tCO2e) Scenario P	60-year carbon emissions (tCO2e) Scenario R	Change (tCO2e)
Non-traded	24,233,522	24,263,495	29,943

Emissions class	60-year carbon emissions (tCO2e) Scenario P	60-year carbon emissions (tCO2e) Scenario R	Change (tCO2e)
Traded	454,835	455,086	252

3.4.57 Values from the TAG Data Book were used to monetise the change in carbon emissions. Across the 60-year appraisal period of the scheme, the change in carbon emissions in the non-traded sector (TAG Unit A3 states that only changes in emissions in the non-traded sector should be included within the economic appraisal) would equate to a carbon impact of -£2.19m (2010 PV). It should be noted that the central carbon values from the TAG Data Book have been used, with lower and upper values considered as part of sensitivity analysis showing a carbon impact of between -£1.09m and -£3.28m (2010 PV).

3.4.58 In addition to the carbon impacts estimated using the transport model, there is also estimated to be an impact on emissions as a result of modal shift to active modes as a result of the shared use path delivered as part of the housing access road. A reduction in greenhouse gas emissions from modal shift arising from new walking and cycling infrastructure is quantified as a direct benefit from the scheme. This has been estimated using the DfT's AMAT, with the impact valued at £0.08m (2010 PV).

3.4.59 Table 3.18 shows the scheme impact on carbon.

Table 3.18 – Greenhouse gas impacts

Greenhouse gas impacts	£m, 2010 PV over appraisal period
Greenhouse gas impact (KLTM)	-2.19
Greenhouse gas impact (AMAT)	0.08
Total	**-2.11**

3.4.60 At this stage the embodied carbon impacts of the scheme have not been included within the appraisal. As part of the development of the OBC, a Carbon Management Plan (CMP) fully aligned to DfT guidelines and PAS2080:2023 has been produced detailing how the scheme will manage

and minimise carbon emissions across the whole project life cycle. The Management Dimension includes further details of the CMP and the opportunities for carbon management and mitigation actions.

Social Impacts

3.4.61 The social impacts assessment has been undertaken in line with DfT TAG Unit A4-1. In accordance with TAG Unit A2-2 and discussions with the DfT, the social assessment has been carried out based on the comparison of the following scenarios:

- Scenario P: without the dependent development and without the transport scheme
- Scenario R: with the dependent development and with the transport scheme

Physical Activity

3.4.62 A shared use path, providing segregation for pedestrians and cyclists, will be delivered as part of the scheme. This will promote the use of active modes for travel to and from the site, resulting in health benefits to site residents and also wider residents in the area who may use the shared use path for some or all of their journey.

3.4.63 The Active Mode Appraisal User Guide (May 2022) sets out the benefits from increased physical activity attributable to active travel. This involves the estimation of reduced risk of premature death resulting from changes to the number of individuals that walk and cycle, as well as the improvement in general health of users that reduces the number of ‘sick days’ and increase economic activity.

3.4.64 The economic appraisal of physical activity captures the health benefits of any change in the number of people travelling by active modes and the ensuing benefits resulting from modal shift. These benefits are based on additional users linked directly to scheme induced demand estimated in paragraph 3.2.47. Over the 20-year appraisal period, the health benefits associated with

the scheme are estimated at approximately £17.62m (2010 PV). This is driven by the increase in cycling and walking trips estimated by comparing scenario P and scenario R. The AMAT is provided in Appendix G (refer to separate document).

3.4.65 There are also wider measures to improve the provision for pedestrians and cyclists which have not been quantified as part of the appraisal, including four additional signalised crossing that may result in improvements in journey quality and modal shift from cars to cycling and walking.

Journey Quality

3.4.66 Journey quality refers to the real and perceived improvement in the physical and social environment while travelling. Journey ambience benefits that relate to a perception of improved safety and/or environmental conditions will accrue to new users whilst using new walking and cycling infrastructure.

3.4.67 Over the 20-year appraisal period for the scheme, improvements to journey quality are estimated to be approximately £2.98m (2010 PV) for active mode users. This is driven by the increased segregation for different transport users (motorists, cyclists and pedestrians) and a reduction in user conflict. There may also be further improvement in factors that affect the quality of walking and cycling journeys including cleanliness, information provision, reductions in user conflict that result from a reduction in overcrowding.

3.4.68 The aim of the scheme is to provide additional capacity and re-route through traffic trying to access the A47 via the A10. There are small journey time savings of approximately £0.16m (2010 PV) for motorists that should reduce driver frustration.

Accidents

3.4.69 The accident appraisal has been undertaken using the DfT's COBA-LT program (v2.5).

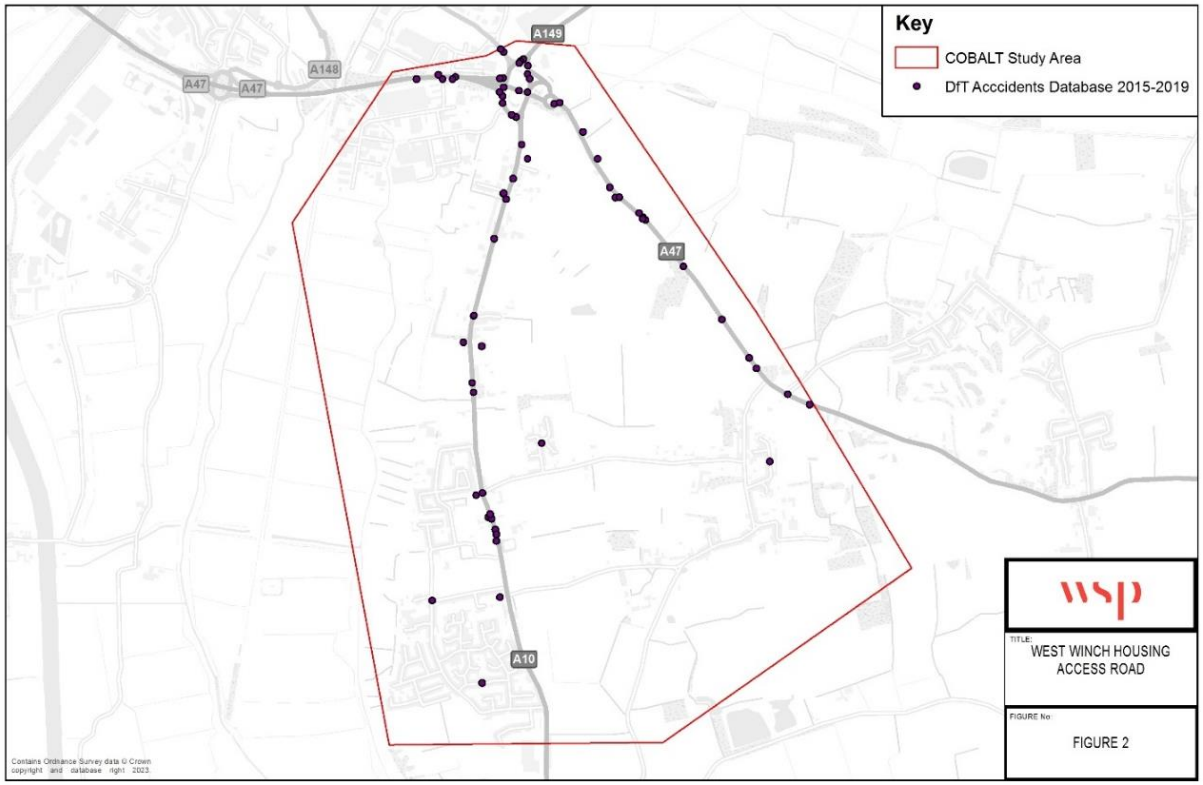
3.4.70 The observed accidents in the study area were extracted from the DfT database for the latest five years for which complete accident data was

available (pre-COVID), which is for the period 2015-2019. The observed accident data was plotted for the links and junctions in the study area to identify the links/junctions for which the accident data was available. This is shown in Figure 3.2.

3.4.71 Accidents that occurred at a distance of equal or less than 20 metres of a junction, were assigned to the junction as a radius of 20 metres (at all directions from the centre of a junction) is considered from COBA-LT as area of influence of the junction. The links/junctions for which the local accident data is available was used in the COBA-LT assessment and the default rate (national average) provided in the TAG Data Book was used for the rest of the links/junctions in the study area.

3.4.72 For the 2015 to 2019 period, 49 accidents were assigned to a link and 16 to a junction. Any accidents reported and included in DfT's accident database for the 2015 to 2019 period, that occurred at locations that are not represented from the SATURN network, were omitted from the assessment.

Figure 3.2 – Study area – DfT accident database 2015-2019



3.4.73 The safety benefits of the scheme were calculated by comparing the cost of accidents over the 60-year appraisal period between Scenario P and R. The results of this are presented in table 3.19. table 3.20 then shows the disaggregation of these results into impacts on links and those at junctions. This adverse accident impact is driven by the scenarios being compared within the appraisal, that is comparing Scenario P with no dependent development and no scheme to Scenario R which includes all dependent development and the transport scheme. The additional development traffic on the local network in Scenario R will result in an adverse accident impact. It is noted that Level 1 impacts would usually be considered under fixed land use i.e., no change in demand between scenarios, and therefore if these scenarios were compared here the impacts wouldn't be of the same magnitude.

Table 3.19 – Accident impacts

Accident impact	**£m, 2010 PV over appraisal period**
Accident impact	-11.94

Table 3.20 – Accident impact breakdown

Accident impact	**£m, 2010 PV over appraisal period**	**£m, 2010 PV over appraisal period**	**£m, 2010 PV over appraisal period**
Breakdown	**Links**	**Junctions**	**Total**
Accident impact	11.74	-23.68	-11.94

3.4.74 As illustrated in Table 3.20, the main contributors to the negative output of the accident assessment are the impacts at junctions. The spatial distribution of the accident impacts of the scheme is discussed within the Place-Based Analysis in Section 3.8. These areas would be considered further as part of detailed design going forwards.

3.4.75 The AMAT focuses on impacts associated with modal shift away from cars and taxis to walking and cycling. This is based on a reduction in distance travelled by motorised transport and the impact on accidents from lower car

usage. Over the 20-year appraisal for the scheme, a reduction in accidents from modal shift is estimated at approximately £0.05m (2010 PV). These impacts are not considered to double count those estimated in COBA-LT as the KLTM does not account for modal shift to active modes, and the wider impacts of this.

3.4.76 Overall, the assessment of accidents as a result of the scheme results in a disbenefit of -£11.89m (2010 PV), which is driven by the increase in traffic on the road network as a result of the development coming forward. It is noted that the summary breakdown of links and junctions shows a positive effect on accidents on links that are outweighed by larger negative effects on accidents and costs at junctions.

Level 2 Impacts – Evolving Monetised Impacts

Reliability

3.4.77 Journey time reliability refers to the day-to-day variation in journey times that individual travellers are unable to predict (also known as journey time variability). Such variation could come from recurring congestion at the same period each day (where the level of delay changes day on day) or from non-recurring events, such as incidents. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects which travellers are assumed to be aware of.

3.4.78 Journey time reliability impacts all users, and impacts travel efficiency, whether, for example, causing problems with delivery schedules or leading to travellers including more 'slack' time in their journeys to account for potential impacts.

3.4.79 The urban roads reliability assessment has been undertaken given the range of route choice on the road network in the study area. The process undertaken is in line with the process and guidance set out in TAG Unit A1-3. The process uses outputs from the KLTM to estimate the reliability impact for urban roads as a result of transport schemes. This provides an estimate of the change in the level of journey time variability depending on the change in

average journey time for each origin/destination pair due to a scheme and the demand and distance between each pair.

3.4.80 Over the 60-year appraisal period the reliability impacts are estimated to be £0.51m (2010 PV, market prices).

3.4.81 The details of the reliability calculations, assumptions and resultant outputs are provided within Appendix I (refer to separate document).

3.4.82 Given the scale of transport user benefits associated with the scheme, and reliability benefits estimated using the urban roads approach, it was not considered proportionate to undertake a rural roads reliability assessment. In particular given TAG Unit A1-3 notes 'it is not a precise or comprehensive method and can only provide a broad indication of the impact of a proposal on reliability.'

Level 3 Impacts – Indicative Monetised Impact

3.4.83 TAG Unit A2-2 sets out the approach to valuing the welfare effects associated with the transport scheme and dependent development, which are addressed separately.

3.4.84 Estimating the costs and benefits of the transport scheme under assumptions of land-use change requires the consideration of four elements:

- Land Value Uplift (LVU) – the change in land value as a result of converting land to a more productive use. This is a private benefit that accrues to the landowner/developer rather than wider society.
- Transport External Costs (TECs) – the impact of the development on existing transport users.
- Non-Transport Complementary Interventions (NCTI) – costs associated with community or education facilities or any other facility.
- Land Amenity Value (LAV) – The change in amenity value associated with different land-use types e.g. converting land from agricultural land to housing, recreational or forested land.

- Other impacts – this usually includes environmental, social and distributional impacts that are termed externalities from the dependent development.

3.4.85 The method used to value the total benefits of dependent development incorporates all private and societal benefits and costs associated with the scheme and the development unlocked or attributable to the transport scheme.

$$Total\ benefits = LVU_D + Other - TEC - LAV - NTCI$$

Where:

LVU_D = Land Value Uplift for that proportion of housing dependent on the transport scheme.

$Other$ = Environmental, social and distributional impacts outlined in TAG Unit A3 and A4.

TEC = Transport External Costs.

LAV = Land Amenity Value, based on changing land-use.

$NTCI$ = Non-Transport Complementary Interventions, with the benefits of these NTCIs captured by the land value uplift.

Land Value Uplift

3.4.86 The LVU has been calculated according to the methodology set out in the DLUHC appraisal guide (March 2023) and TAG Unit 2-2 Appendix D. New development linked to the scheme creates economic value which is reflected in the uplift in the value of land. For the economic appraisal, the difference between this new value – once all the costs of changing land use have been factored in – and its previous value is the LVU and represents the net private benefit of the development which accrues to the landowner/developer.

Deadweight and Dependent Development

3.4.87 The dependency test outlined in Chapter 3.2 shows that 300 homes can be delivered without the scheme. This is defined as the ‘deadweight’ housing and

depicts the number of homes that can be delivered, whilst still maintaining a reasonable level of service on the existing transport network. This means that 3,700 homes are dependent on the scheme, so called 'dependent development' which is the full housing quantum (4,000 homes) minus the deadweight housing.

Housing Delivery and Profile

3.4.88 The WWGA housing delivery profile is based on the housing trajectory from 2022, provided by the Borough Council of King's Lynn and West Norfolk (BCKLWN). This has been adjusted for modelling purposes to assign deadweight housing (300 homes) in the period from 2022/23 to 2026/27.

3.4.89 The remaining 3,700 homes that are dependent on the scheme coming forward are then assumed to be built between 2027 and 2042. Based on the Local Plan review it is assumed that just over 1,000 homes will be completed by 2032 and then 2,695 homes will be completed by 2042.

Displacement

3.4.90 As well as the potential deadweight, the development may result in a decrease in housing demand in adjoining areas or elsewhere in the target area. As such, the appraisal seeks to capture the gross impact of the intervention (measured by land value uplift) and deduct any reduction in the economic activity displaced from elsewhere. As such, the level of displacement is combined with the assessment of deadweight, that can be delivered within the existing transport infrastructure network, to provide the net change in land value or overall additionality that is attributable to the scheme.

3.4.91 The level of displacement has been calculated in line with DLUHC Appraisal Guidance. This sets out the process and recommended thresholds for the calculation of displacement.

3.4.92 Combining values with the recommended thresholds contained in the DLUHC guidance document provides a level of displacement at 29%. It is noted that this figure does not take into account some locally specific factors which may

impact on the level of displacement. The WWGA site has been identified as being the only location within the area which could accommodate a development of this scale given the significant constraint caused by flood zones in the surrounding area. Therefore, the level of displacement may be lower than that output from following the DLUHC guidance. Sensitivity tests have been undertaken assuming different levels of displacement, these results are presented in Section 3.5.6.

Additionality

3.4.93 In appraising the effects of the intervention, it is important to assess the additional impact or additionality i.e. the net changes that are brought about over and above what would have taken place anyway. To estimate total additionality the following formula has been used once the deadweight and displacement calculations have been made.

Additionality = (1 – deadweight) x (1 – displacement)

3.4.94 Approximately 8% of the total housing quantum of 4,000 units is anticipated to be deadweight housing. Using the method and process outlined for the calculation of displacement, approximately 29% of total value is expected to be displaced.

3.4.95 The total additionality value of the development is calculated at 66%, equivalent to 2,640 homes. Table 3.21 shows the calculation and result for additionality and the component data sources used in the calculation of deadweight and displacement factors.

Table 3.21 - Additionality

Ref	Item	Assumed Value	Criteria/Calculation	Source
a	Total no. of units	4,000	Not applicable	WWGA
b	Deadweight no. of units	300	Not applicable	KLTM dependent development modelling outputs

Ref	Item	Assumed Value	Criteria/Calculation	Source
c	Deadweight % of total (b/a)	7.5%	Not applicable	Not applicable
d	Proportion of social/affordable rent of total	20%	Not applicable	BCKLWN affordable housing policy
e	Affordability Ratio	8.64	Not applicable	King's Lynn and West Norfolk, Local Authority Housing Affordability, 2022
f	Work-place based affordability ratio (High)	80%	▪ 60% if local authority affordability ratio of equal to or over 10, ▪ 80% between 7 and 100 and ▪ 100% if equal to or below 7.	DLUHC appraisal guide
g	Net additions to stock over the past 10 years	more than 1.2%	Change from 2013 to 2022	King's Lynn and West Norfolk, DLUHC housing stock statistics, 2022
h	Development activity (High)	45%	▪ 45% if net additions to stock over the past 10 years is less than or equal to 5%, ▪ 50% if 5% to 7% and ▪ 55% if over 7% of the housing stock	DLUHC appraisal guide
i	No. of units being delivered	100%	▪ 40% if 100 total units or fewer, ▪ 60% between 101-250 total units, ▪ 70% between 251-500 and ▪ 100% if over 500 total units	DLUHC appraisal guide

Ref	Item	Assumed Value	Criteria/Calculation	Source
j	Displacement (1-d)*f*h*i	29%	= (1-0.20) x0.80x0.45x1.00	Not applicable
k	Additionality (1-c)*(1-j)	66%	= (1-0.075) x (1-0.29)	Not applicable

Gross Development Value

3.4.96 The Gross Development Value (GDV) is used to determine land values and is an important component in the estimation of LVU. GDV is the estimated total revenue a developer could obtain from the land and in the context of housing, calculated by multiplying the number of dwellings in the development area by the assumed house price per dwelling.

GDV = House prices x number of dwellings in the development area

3.4.97 The average house price in King's Lynn and West Norfolk was estimated by Gerald Eve at £220,000 as part of the development of the SOC in 2020. The Land Registry dataset shows significant house price increases in the Borough, with house prices rising by approximately 3.4% in real terms over the last 10 years on average.

3.4.98 Real house price growth at 3.4% is applied every year from 2020 to 2042 and is combined with the housing delivery profile to provide an estimate of the GDV or total housing value for the development in 2020 prices. Adjusting to 2010 market prices and discounting to 2010 values, for the purposes of economic appraisal, gives a GDV estimate of £390.20m once adjusted to market prices. The detail of this adjustment is included in Appendix G (refer to separate document).

Build Costs

3.4.99 Table 3.22 shows the values and sources of developer cost components as well as professional fees and developer profits associated with the WWGA development. The Infrastructure Development Plan (IDP) for the South East King's Lynn Strategic Growth Area includes a high-level development appraisal for the WWGA site. This is the main source of the data for the

assessment of different cost components used in the economic appraisal of LVU associated with the development.

Table 3.22 – IDP development cost components

Parameter	Value	Source
Average house size	927 sq. ft.	Weighted average of build sizes and housing composition in IDP
Build costs	£112/sq. ft. (2018 prices)	Gerald Eve
Professional Fees	8.0% of GDV	IDP
Developer Profit	17.0% of GDV	Land Value Estimates for Policy Appraisal (May 2017 Values)
Sales Agent Fees	1.0% of GDV	IDP
Legal Fees	0.5% of GDV	IDP
Marketing	1.0% of GDV	IDP
Finance Costs	7.0% of build costs	IDP
Contingency	5.0% of build costs	IDP
Growth in build costs	▪ 2019: 1.5% ▪ 2020: 1.2% ▪ 2021: -2.1% ▪ 2022: 6.4% ▪ 2023: 8.6% ▪ 2024: 2.9% ▪ 2025: 2.8% ▪ 2026: 3.2% ▪ 2027: 3.4% ▪ 2028: 3.5% ▪ 2028 onwards: average of 2024 to 2028	BCIS All In Tender Price Index (TPI) forecast at August 2023
Dwellings/acre	11.5	IDP

3.4.100 Development costs are a function of total build costs, plus a proportion of the Gross Development Value (GDV) assigned to professional fees, sales, legal and marketing fees. Financing costs and contingency are taken as a percentage of build costs in line with DLUHC guidance but are tailored to the

local context using the IDP assumptions at 7% of build costs for financing and 5.0% for contingency, respectively.

3.4.101 Total build costs are calculated on the assumption of £122 per square foot (2018 prices) contained in the IDP. This is uprated each year by construction cost inflation, using the BCIS All-in Tender Price Index.

3.4.102 The average house size of 927 square feet for the WWGA development is the weighted average of building size and housing composition, contained in the IDP. Over the development horizon, the developer costs are estimated to be £206.88m (2010 prices, PV), or £246.19m once adjusted to market prices. The detail showing the treatment of the build costs within the appraisal is included in Appendix G (refer to separate document).

Current Land Value

3.4.103 Currently the site identified for development is agricultural land (intensive). Based on the IDP, it has been assumed that 11.5 dwellings can be developed in one acre of the site extent. For the 2,640 additional homes that are dependent on the scheme, the area of the site allocated for development would be approximately 230 acres or 93 hectares. Based on the BCKLWN 2016 Viability Assessment, the IDP stated a value for the land in current agricultural usage at £10,000 per acre, expressed in 2016 prices. It has been assumed that this valuation would grow in line with the house price growth assumption which underpins the GDV calculation. Multiplying this by the number of acres that housing is developed on each year, converting to 2010 prices and discounted to 2010 at a rate of 3.5% per annum over the development horizon gives a current land value of £1.66m, or £1.98m once also adjusted to market prices. The detail showing the treatment of the current land value within the appraisal is included in Appendix G (refer to separate document).

Non-Transport Complementary Interventions (NTCI)

3.4.104 The development at the WWGA is also dependent on other non-transport complementary interventions such as the provision of schools, utilities, and the community infrastructure. TAG Unit A2-2 suggests that the cost of NTCIs should be included in the valuation of dependent development as they are intrinsically linked to the uplift in land values i.e. the benefits are assumed to be captured by the land value uplift.

3.4.105 The IDP identified a number of facilities that would be required on site in addition to the residential development. The total cost of NTCIs in 2018 prices is approximately £65.87m split between education and community facilities and green infrastructure, shown below.

- Education facilities: £28.67m
- Community facilities: £9.18m
- Green infrastructure: £28.02m

3.4.106 Within the appraisal these costs have been adjusted for real growth in line with BCIS TPI inflation forecasts, converted to 2010 prices and discounted to 2010 using a 3.5% annual discount rate applied over the development horizon for these NTCIs. The resultant cost is £19.66m (2010 PV), or £23.39m once adjusted to market prices. It is noted that there would be some positive land value impact from these facilities which would at least partially offset these costs. The detail showing the treatment of the NTCI costs within the appraisal is included in Appendix G (refer to separate document).

3.4.107 As described TAG Unit A2-2, the land value uplift associated with a transport scheme may not be completely attributable to the transport investment, with NTCIs potentially playing a part in driving any future uplift in land values estimated. As such, the cost of NTCIs is included in the valuation of the dependent development as disbenefits to ensure that the economic appraisal reflects all known and quantifiable costs and benefits.

Transport External Costs

3.4.108 Transport external costs (TECs) capture the effect of additional transport demand imposed by dependent transport users on all other users, such as increased levels of congestion and/or overcrowding. These costs arise as a result of those trips generated by the new development which are dependent on the scheme.

3.4.109 The assessment of transport external costs from dependent development has been modelled using the KLTM for the following scenarios to capture the additional costs to existing transport users with and without the dependent development component of the WWGA.

- Scenario S: without the dependent development but with the transport scheme
- Scenario R: with the dependent development and with the transport scheme

3.4.110 The two scenarios have been run in the KLTM, and outputs extracted and processed in TUBA, using the same assumptions as for calculation of the transport user benefits. The impact on journey times, vehicle operating costs and indirect tax have been calculated using the same approach as when valuing the transport scheme. In line with guidance in TAG Unit A2-2, for the purpose of the appraisal the Scenario S demand matrix is used within TUBA for both scenarios as the TECs represent the impact of development traffic on existing users.

3.4.111 Table 3.23 shows the TECs over the appraisal period, with detailed TUBA outputs included in Appendix H (refer to separate document).

Table 3.23 – Transport external costs

Transport External Costs	£m, 2010 PV over appraisal period
Journey time impact	-17.29
VOC (Fuel and Non-Fuel) impact	-0.59

Transport External Costs	**£m, 2010 PV over appraisal period**
Indirect tax impact	0.20
Overall TECs impact	**-17.68**

3.4.112 Congestion costs to existing transport users from the dependent development will have an impact on journey times, VOCs and indirect tax. The journey time impact of the dependent development is estimated at -£17.29m (2010 PV, market prices) over the appraisal period. The VOC fuel and non-fuel impacts from the development are estimated at -£0.59m for all transport users and there is a small monetary benefit to the Exchequer of £0.20m from an increase in tax revenue. The total costs imposed by dependent transport users on all other users is estimated at £17.68m (2010 PV, market prices).

3.4.113 Further details of the methodology and outputs are included within the Forecasting Report.

Land Amenity Value

3.4.114 Land Amenity Value (LAV) is estimated based on the change in land expected from the new development at the WWGA. The site allocated for housing development in the BCKLWN Local Plan is greenfield land, the majority of which is used for agricultural purposes.

3.4.115 The housing scheme, as well as addressing housing needs in the area, delivers a range of other significant amenity benefits such as open space, active transport (cycleways and footpaths) and other recreational use facilities and land-types that will serve and benefit existing residents in the wider area.

3.4.116 TAG Unit A2-2 explicitly assumes that developed land has no amenity value, but 'where a scheme is expected to have major landscape impacts it may be desirable to undertake context-specific analysis for the change in land amenity value' (DfT 2020 TAG Unit A2.2 Appraisal of Induced Investment Impacts, page 14, located on DfT's website).

3.4.117 The change in amenity value for the development has been estimated on the basis of planning assumptions for the WWGA. This has been combined with estimates of external benefits of undeveloped land contained in the TAG Valuing Dependent Development Workbook (DfT (2021) TAG: economic impacts worksheets, Valuing dependent development workbook, externality values, located on DfT's website).

3.4.118 Based on planning assumptions of 11.5 dwellings per acre (see Table 3.22) and the profile of housing completions over the development horizon to 2042, the estimated land take for housing is calculated at approximately 229 acres. The current land use is assumed to be agricultural extensive.

3.4.119 In line with TAG Unit A2-2 this development area is assumed to have zero amenity value. As such, the loss of amenity value from the change is land use associated with the residential development is estimated at -£33.16m (2010 PV, market prices).

3.4.120 Context specific analysis has been undertaken using detailed planning assumptions on the implementation of 'green infrastructure', captured within the costs of non-transport complementary interventions (NTCIs) associated with the development. This is likely to have a net external impact in terms of amenity benefit from the re-development of land for recreational purposes. Table 3.24 shows how the different green infrastructure elements have been attributed to the land types and the areas of each land type assumed within the LAV appraisal. Within the appraisal these land areas have been combined with the perpetuity amenity values within the DfT's Valuing Dependent Development Workbook to provide a monetary value. This analysis results in an amenity value of £16.56m (2010 PV). The detail showing the treatment of the LAV within the appraisal is included in Appendix G (refer to separate document).

Table 3.24 – Planning assumptions – WWGA green infrastructure

Description	Land Type	Land Allowance (acres)
Formal recreation facilities such as playing fields	Urban Fringe (Greenbelt)	35.2
Play areas	Urban Fringe (Greenbelt)	Not applicable
Other green spaces	Urban Fringe (Greenbelt)	Not applicable
Allotments	Agricultural (Extensive)	1.1
Natural and semi-natural green spaces, including footpath links and hedgerows (landscape buffers)	Natural and Semi-Natural	49.3

Health Impacts

3.4.121 The formula for estimating the external health impacts from additional rented affordable housing is outlined in Annex G of the DLUHC Appraisal Guidance. There are both external impacts and private impacts associated with health improvements. The private health benefits from additional rented affordable housing are already accounted for in the land value uplift calculations. The external benefits to society from a reduction in rough sleeping and/or the probability of a new tenant that had been living in a poor condition or overcrowded property moving into a new property as part of the development brought about by the scheme has been calculated.

3.4.122 The affordable housing component of the new development at the WWGA is assigned at 20%, in line with the BCKLWN affordable housing policy guidance note. This amounts to approximately 800 affordable homes spread over the development horizon from 2025 to 2042.

3.4.123 The external health impact of an additional affordable housing unit is £206 per year or £3,900 in present value terms over 30 years. This is calculated as part of the DLUHC appraisal guidance and is a function of the annual health care cost (£4,900, The Building Research Establishment (BRE)

estimates that leaving vulnerable people in the poorest 11% of England's housing costs the NHS over £1.5billion per year in first year treatment costs (in 2022 prices) multiplied by the probability that someone is a former rough sleeper (The BRE estimates a probability that 1.5% of new social housing lets go to rough sleepers. This is based on CORE data for 2019/20 that shows around 1.5% of new lets to General Needs Private Registered Providers (PRP) are those who say they were previously rough-sleeping.) plus the probability of a new rented affordable housing unit reducing overcrowding (The BRE estimates the probability that a new unit reduces overcrowding, equal to 98.5% i.e. the proportion of people not categorised as previous rough-sleepers minus 10% household formation) multiplied by the annual impact of reduced overcrowding at £149 per unit annual saving (in 2022 from an additional affordable housing unit reducing overcrowding).

3.4.124 The total health impacts from additional affordable housing delivered by WWGA development is equal to £0.07m (2010 PV).

Summary

3.4.125 Considering the LVU, TECs, NCTIs, LAV and the health benefits of affordable housing as set out above provides a value of the dependent development of approximately £84.43m (2010 PV, market prices). Table 3.25 shows the calculation and the estimation of total benefits, not including environmental, social and distributional impacts. All benefits are expressed in 2010 market prices and discounted to 2010 to calculate the value of the dependent development.

3.4.126 The economic appraisal shows that over the delivery period to 2042, the housing site generates significant benefits to the landowner/developer. However these benefits accrue over a long duration, and the road will require early delivery and forward funding. The viability assessment undertaken as part of the IDP identified the level of developer contribution was at the maximum reasonable level.

Table 3.25 – Valuing the benefits of the dependent development

Element	£m, 2010 PV
GDV	390.20
Build costs (excluding NTCI costs)	-246.19
Current land value	-1.98
NTCI costs	-23.39
Land Value Uplift	**118.64**
TECs	**-17.68**
LAVs	**-16.59**
Health impacts of affordable housing units	**0.07**
Total benefits (2010 PV, market prices)	**84.43**

3.4.127 In line with guidance in the Value for Money Framework, induced investment impacts are considered within the Indicative Monetised Impacts. Therefore, these Level 3 impacts are not considered within the initial or adjusted Benefit Cost Ratio (BCR) for the scheme but are used as a 'switching value' of the VfM category.

3.4.128 The DfT tool 'Valuing Dependent Development Workbook' provides a high-level methodology for calculating the land value impacts of a scheme. The tool provides a monetary value per hectare under different uses for different geographical areas. For agricultural land, the value for New Anglia (the lowest disaggregation with the tool) is £21,000/hectare (2017 prices). This is equivalent to £8,500/acre (2017 prices). The value for the current land in the IDP, based on locally specific information, was £10,000/acre (2016 prices).

3.4.129 For residential land, the tool has a value for King's Lynn and West Norfolk of £810,000/hectare (2017 prices). This is equivalent to £327,800/acre (2017 prices). This value is assumed to represent the value of an acre of land with planning permission and is therefore comparable to the GDV minus build costs estimated in the appraisal. Based on the appraisal undertaken the value of an acre of residential land is estimated to be approximately £629,000/acre (2010 prices). Noting the differing price bases, this suggests that the value of

residential land in the area as estimated through locally specific information is higher than that given in the DfT Workbook. The values are nearer to the DfT values provided for Mid Suffolk and Forest Heath. The Workbook states that 'users are encouraged to draw upon alternative sources of evidence to inform estimation of land values', therefore it is considered appropriate to use the locally specific values which informed the IDP.

Level 3 Impacts – Non-Monetised Impacts

Environmental Appraisal

3.4.130 The environmental appraisal has been undertaken in line with TAG Unit A3, in an approach proportionate to the stage and scale of the scheme. In accordance with TAG Unit A2-2 and discussions with the DfT, the environmental assessment has been carried out based on the comparison of the following scenarios:

- Scenario P: without the dependent development and without the transport scheme
- Scenario R: with the dependent development and with the transport scheme

Landscape

3.4.131 The landcover within the study area is largely rolling open arable farmland, which, to the western side, is bound by drainage ditches connecting to the rivers. The field pattern is medium to large with regular and geometric boundaries, often lacking hedges, with some parcels of woodland and copses. To the north, King's Lynn and associated suburbs, South Lynn and Hardwick, comprise the most urbanised part of the study area, consisting of a mixture of residential and industrial development.

3.4.132 The A10 runs north-south, and is flanked by pockets of built form, the largest of which currently being West Winch. In addition, the A47 runs northwest-southeast through the study area. It passes through the industrial area to the north, and feeds into the small village of North Runcton, but is

otherwise flanked by agricultural land. Throughout the site and surrounding study area, the topography is largely flat. The areas to the south and west are enclosed by the River Nar, a tributary to the Great Ouse.

3.4.133 There is a moderate sense of tranquillity due to the predominantly rural nature of the landscape with few built up areas. There is some noise and light pollution associated with the A10, A47 and also from existing settlements, most notably around King's Lynn and its suburbs towards the north of the study area.

3.4.134 The scheme and associated development will result in an increase in traffic flow and associated noise and light pollution at a local level, where there was previously very little. While this may have a negative impact on the immediate local area, the wider character impacts across the study area will be negligible. There will be slight adverse impacts in terms of views and tranquillity, but this is likely to be felt at the local level, with the scheme having limited capacity to influence landscape and visual amenity, beyond an immediate and local level. Vegetation loss will be inevitable in certain areas in the immediate vicinity of the construction works, however this will be offset by mitigation planting, so overall there will be little change. There is also ample opportunity for effective landscape mitigation measures to be implemented to reduce adverse effects.

3.4.135 The TAG Environmental Impacts Worksheet for landscape is provided in Appendix J (refer to separate document). The overall assessment shows that the existing landscape might be affected by scheme implementation. Based on the current scheme design, the effect is anticipated to **Slight Adverse** on the basis of changes to tranquillity and landcover (vegetation) that are localised in nature.

Townscape

3.4.136 There is wide variation in the layout of urban settlements with nucleated rural settlements such as West Winch and North Runcton and further north, King's Lynn historical town centre where there are many listed

buildings, some dating back to the 12th century. The industrial estate area of Hardwick lies immediately to the north of the scheme extent and contains an abundance of warehouses and industrial properties.

3.4.137 There is a mix of building materials and architectural styles used for the residential properties in both the rural settlements and suburbs of King's Lynn. In more industrial areas such as the Hardwick Industrial Estate there is quite a uniform appearance of grey warehouses, steel gates, brickwork, and splashes of colour for signs and logos.

3.4.138 The rural settlements within the study area are generally low-density with plenty of green infrastructure, gardens and agricultural surroundings. The structures within the rural settlements are mostly two-storey buildings and some bungalows, with the exception of some of the listed buildings such as the Church of All Saints and the Church of St Mary and The Mill at West Winch. Within the Hardwick Industrial Estate, the building sizes are considerably larger in scale albeit more linear than tall in nature. Moving towards the centre of King's Lynn there is a greater mix of architectural styles, historic and modern development, more green infrastructure, such as avenues of street trees and some public parks.

3.4.139 The scheme is not considered to significantly impact on the townscape at an immediate and local level. Thus, no impacts are anticipated as a result of the scheme.

3.4.140 The TAG Environmental Impacts Worksheet for townscape is provided in Appendix J (refer to separate document). The overall assessment shows that the existing townscape character will be maintained and is not vulnerable to change resulting from the scheme and associated development proposals. The effect is anticipated to be **Neutral** and is based on the assumption that appropriate mitigation is achievable if required.

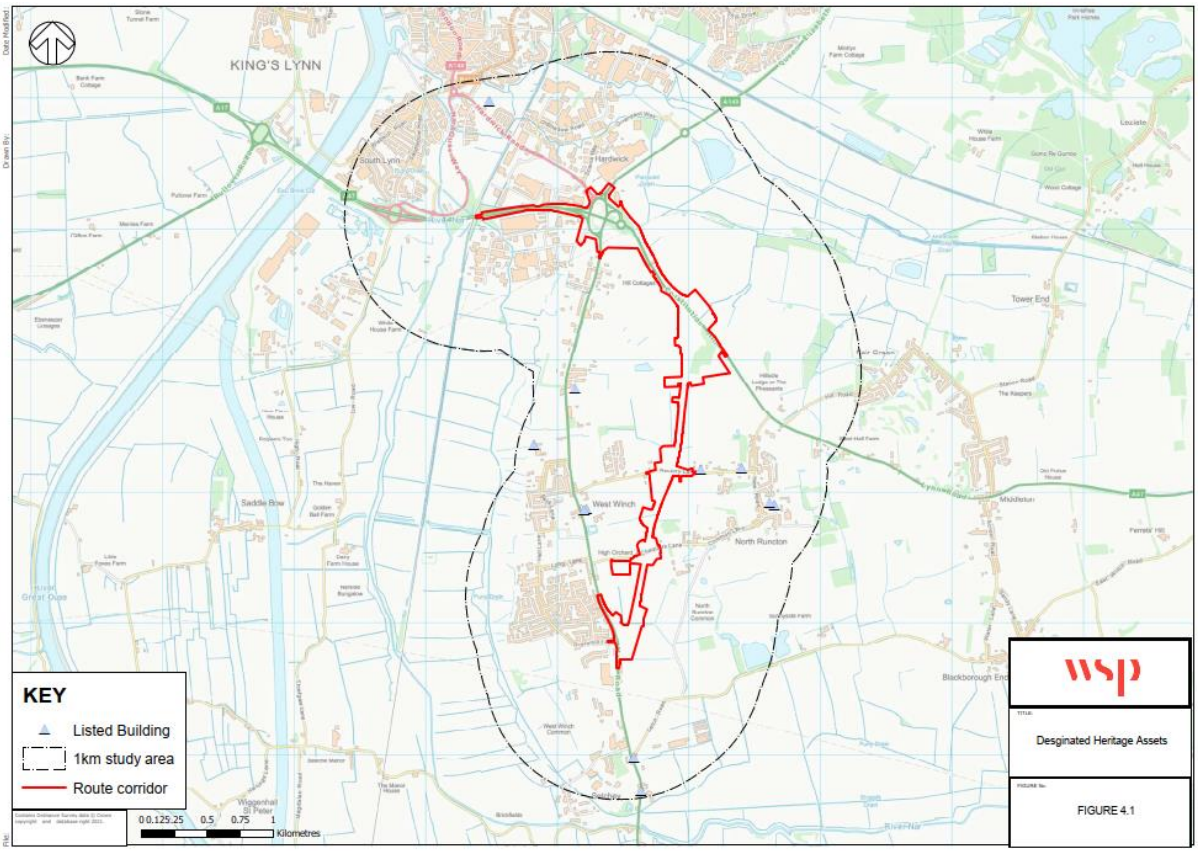
Historic Environment

3.4.141 There are no World Heritage Sites, Scheduled Monument, Registered Parks and Gardens, Registered Battlefields or Protected Wreck sites within 1km of the study area.

3.4.142 Figure 3.3 shows the 11 designated heritage assets within the 1km study area, all of which are listed buildings (one listed Grade I, one listed Grade II* and nine listed Grade II). Of these, three are possibly physically affected by the scheme (Grade II* listed building Church of St Mary (NHLE: 1342420) and two Grade II listed buildings of West Winch War Memorial (NHLE:1457776) and The Old Rectory (NHLE: 1077652)). The remaining eight, including Grade I listed Church of All Saints (NHLE: 1342408), have the potential for the setting of these historic assets to be impacted.

3.4.143 The assessment also included a review of non-designated heritage assets on the Norfolk Historic Environment Record (NHER), identifying a number of non-designated heritage assets within the boundary of the scheme potentially impacted. Immediately adjacent to the scheme boundary is the site of Fincham's Manor (NHER: 3373;16) which is a Medieval moated enclosure. Direct physical impacts to these assets would be sought to be avoided through the detailed design stages.

Figure 3.3 – Designated heritage assets



3.4.144 The scheme and associated development is expected to have a negligible impact on the historic environment, provided that the scheme avoids physical impacts to designated heritage sites and the non-designated heritage site at Fincham's Manor. If there were impacts to Fincham's Manor then this could result in the impact on historic environment being Moderate Adverse.

3.4.145 The TAG Environmental Impacts Worksheet for historic environment is provided in Appendix J (refer to separate document), and includes further detail of the anticipated impacts of the scheme on the historic environment.

Biodiversity

3.4.146 There are no internationally designated sites within 2km of the scheme. The only nationally designated site within 2km is the River Nar Site of Special Scientific Interest (SSSI) located 0.7km from the scheme. There are two regionally designated sites within 2km of the scheme, County Wildlife Sites

(CWS) and Habitats of Principal Importance (HPI), most notably Sheep's Course Wood CWS adjacent to the scheme and hedgerows (including potential important hedgerows), lowland mixed deciduous woodland, wet woodland and ponds within the site. Suitable habitats and/or records of the following protected species have been identified within the site:

- Bats
- Badgers
- Terrestrial Invertebrates
- Otters
- Water Vole
- Wintering birds
- Breeding birds
- Reptiles
- Great crested newts

3.4.147 Further information can be found within the TAG Environmental Impacts Worksheet for biodiversity, provided in Appendix J (refer to separate document).

3.4.148 The scheme will result in the loss of areas of lowland mixed deciduous woodland, wet woodland hedgerows, and ponds adversely affecting these habitats. Although replacement habitat is proposed through landscaping and additional land will be acquired for landscape and ecological mitigation, this habitat will not directly compensate for the established habitats due to the time that it will take for habitats to become established to the same quality and structure as those lost. As such, moderate adverse effects are anticipated.

3.4.149 There are anticipated to be slight adverse effects on Sheep's Course Wood CWS from the pollution due to the proximity to the scheme. Due to habitat loss, there is also anticipated to be a slight adverse impact are on

terrestrial invertebrates and wild birds. Trees and buildings with suitability for roosting bats will be lost to the scheme. Suitable bat commuting habitat will largely be maintained, and where loss is unavoidable, suitable mitigation will be in place, such as maintaining existing flight paths and creating new corridors alongside maintaining / planting vegetation to maintain crossing points. Overall, the scheme is anticipated to have a slight adverse effect on bats.

3.4.150 The TAG Environmental Impacts Worksheet for biodiversity is provided in Appendix J (refer to separate document). The overall assessment shows that the anticipated effect on biodiversity is **Moderate Adverse** which has applied professional judgement and accounts for the cumulative effect of slight adverse effects upon certain ecological features as well as moderate adverse effects upon habitats of principal importance which is the most adverse category.

Water Environment

3.4.151 One main river, the River Nar, and its tributaries and several ordinary surface waterbodies including Country Drain and tributaries, Middleton Stop Drain, Pierpoint Drain, and land drains and ditches are located within 1km of the scheme. There is the potential for the scheme to affect the hydromorphological quality of the water features associated with works within or in close proximity to water features such as the installation of culverts and bridges. There is also an increased pollution risk to surface water features as a result of the scheme. These effects are unlikely to be significant. Slight adverse effects to the land drains crossed by the scheme are predicted but this is not considered significant given the assumed low importance of these features.

3.4.152 The majority of the scheme is located in Flood Zone 1 (low probability of flooding) with the northern extent of the scheme in Flood Zone 2 (medium probability of flooding) and Flood Zone 3 (high probability of flooding). Run-off generated through the construction and operation phases of the scheme has the potential to change the chemical composition of groundwater bodies and

nearby watercourses, however, mitigation will be implemented to minimise the likelihood of chemical contamination which could impact the features of this waterbody (e.g. water supply, dilution of waste products). Construction impacts on water quality can be appropriately managed by the implementation of a Construction Environmental Management Plan (CEMP) that manages pollution risk.

3.4.153 The TAG Environmental Impacts Worksheet for water environment is provided in Appendix J (refer to separate document). The overall assessment shows that the anticipated effect on the water environment is **Neutral (No Change)** and is based on the assumption that appropriate mitigation is achievable where required.

Summary

3.4.154 Table 3.26 summarises the environmental appraisal of the scheme, including the transport scheme and dependent development impacts.

Table 3.26 – Environmental appraisal summary

Environmental impact	Assessment
Landscape	Slight Adverse
Townscape	Neutral
Historic environment	Neutral - This assessment could change should there be considered to be an adverse impact on Fincham's Manor as a result of the scheme
Biodiversity	Moderate Adverse
Water environment	Neutral

Social Appraisal

3.4.155 Social impacts consider the overall impact of a scheme on different indicators outlined in TAG Unit A4-1. They cover the human experience of the transport experience and its impact on social factors that are not considered as part of the economic and environmental impacts.

3.4.156 The assessment is mandatory in the appraisal process and is a constituent part of the AST. Both beneficial and/or adverse effects of the

scheme are considered in the social impact appraisal. The distributional impact (DI) appraisal in Chapter 3.7 follows the approach set out in TAG Unit A4-2 and considers the variance of overall impacts on different social groups. The indicators considered for social and distributional impacts arising from the scheme are shown in Table 3.27.

Table 3.27 – Indicators considered for social and distributional impacts

Indicator	Social Impact	Distributional Impact
User benefits	Not applicable	Yes
Personal affordability	Not applicable	Yes
Noise	Not applicable	Yes
Air quality	Not applicable	Yes
Security	Yes	Yes
Accessibility	Yes	Yes
Severance	Yes	Yes
Accidents	Yes	Yes
Physical Activity	Yes	Not applicable
Journey quality	Yes	Not applicable
Option Values and Non-Use Values	Yes	Not applicable

3.4.157 In accordance with TAG Unit 2-2 and discussions with the DfT, the social assessment for the scheme has been carried out based on a comparison of the following scenarios.

- Scenario P: without the dependent development and without the transport scheme.
- Scenario R: with the dependent development and with the transport scheme.

3.4.158 Specific social indicators for which there are established techniques to quantify and monetised the impacts e.g. accidents, physical activity, and journey quality impacts, are included within the Level 1 Impacts section. For

the remainder of social indicators outlined in Table 3.27, a proportionate approach has been undertaken to consider the impact qualitatively.

Security

3.4.159 TAG Unit A4-1 identifies seven indicators which should be considered as part of the security appraisal, including:

- Site perimeters, entrances and exits
- Formal surveillance
- Informal surveillance
- Landscaping
- Lighting and visibility
- Emergency call

3.4.160 The guidance also states that security concerns are greater on roads where motorists are required to slow or stop their vehicle, including at traffic lights or congested areas.

3.4.161 The scheme includes a new housing access road that joins the A10 with the A47 before the Hardwick Interchange. This will improve traffic flow on the A10 by re-routing strategic traffic onto the WWHAR. Lower speed restrictions and additional pedestrian crossings along the current A10 may reduce perceptions of personal security for motorists. It is assumed that all lighting and CCTV will be maintained along existing routes that border the site and informal surveillance is unlikely to have an impact as the changes are in an area where most trips will be by private car.

3.4.162 There are number of bus stops and public transport services that use the current A10, particularly adjacent to West Winch to the southwest of the scheme area. However, the scheme is not expected to result in any change to public transport waiting and/or interchange facilities that serve existing passengers. It is noted that complementary measures identified in the STS may provide waiting and interchange facilities for public transport users,

however the benefits of this have not been considered directly within this OBC.

3.4.163 There is expected to be a high level of informal surveillance on cycling routes into and out of the development site as housing is constructed. It is also expected that cycling routes that are located off the carriageway will benefit from investment in lighting and formal surveillance as part of scheme design.

3.4.164 On balance, the overall impact on personal security is expected to be small and expected to be neutral.

Access to Services

3.4.165 For the purposes of this analysis, it has been assumed that the frequency or routings of buses will not be altered as a result of the scheme. Whilst it is noted that as part of the wider STS complementary measures bus routes and services are being considered, the impacts of this do not form part of this OBC directly. Modelling results have shown a small, positive improvement in journey time impacts in the KLTM core modelled area. These time savings are expected to enhance accessibility for car users.

3.4.166 Overall, the scheme does not include measures that are anticipated to materially change the availability or accessibility of public transport services in the study area. As such, the impact of the scheme is expected to be neutral.

Severance

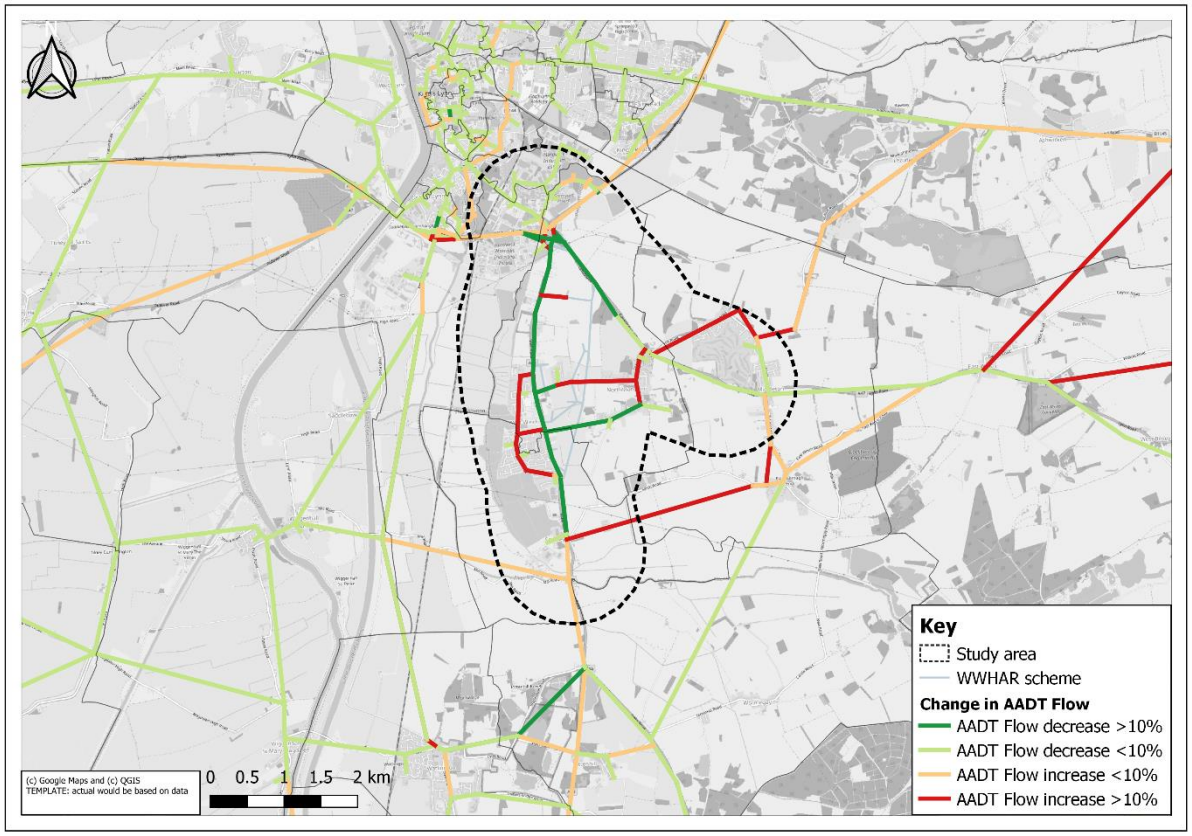
3.4.167 Community severance is defined in TAG Unit 4-1 as the separation of residents from facilities and services they use within their community because of significant changes in transport infrastructure or by changes in traffic flow. For the purposes of this analysis, severance impacts are assessed by considering detailed scheme drawings and forecast changes in traffic flow, based on AADT. A 1km buffer is applied around major scheme links where significant changes in traffic flow are expected.

3.4.168 The scheme includes the addition of pedestrian crossings along the route of the A10. This will result in the relief of severance for pedestrians as they can more easily cross this road at formalised crossing points, reducing severance for pedestrians and cyclists between the development site and West Winch. The STS also identified a package of complementary measures that could be delivered alongside the scheme to improve accessibility for residents of West Winch. Whilst not considered within the appraisal of the scheme it is acknowledged that these measures would support reducing severance.

3.4.169 As discussed, traffic may re-route as a result of the scheme, causing changes to traffic flow and speed in the surrounding area. This could impact pedestrian perceptions of severance if they need to cross a road to access local amenities.

3.4.170 Figure 3.4 illustrates changes in traffic flow resulting from scheme implementation. There are increases in traffic flow of over 10% for those links traversing the development site, such as Rectory Lane, Chequers Lane, Setch Road and Hill Road. There are also greater than 10% increases in traffic flow on accesses to West Winch village from the north. This is balanced against significant decreases in traffic flow of over 10% on the A10 between Hardwick roundabout and Setch road junction and on the A47 approach to Hardwick Interchange.

Figure 3.4 – Changes in AADT flows resulting from the scheme



3.4.171 Overall, it is likely that the effect of the scheme on severance will be moderate beneficial as increases in severance on minor roads traversing the development site are outweighed by the relief of severance on major strategic links, the A10 and A47, through improved pedestrian crossing facilities and a reduction in traffic flow.

Option and Non-use Values

3.4.172 TAG Unit 4-1 requires that option values and non-use values are assessed if the scheme being appraised includes measures that substantially change the availability of transport services within the study area. As the scheme includes no changes to any public transport routes or services provided in the area (noting public transport measures identified in the STS are not being considered directly within this OBC), no specific changes to transport services are anticipated. Therefore, no further appraisal has been undertaken for option values and non-use values.

Summary

3.4.173 Table 3.28 summarises the social appraisal of the scheme, including the transport scheme and dependent development impacts.

Table 3.28 – Social appraisal summary

Social impact	Assessment
Security	Neutral
Accessibility	Neutral
Severance	Moderate Beneficial
Option and non-use values	Not applicable

3.5 Value for Money

3.5.1 In line with the guidance in the DfT's Value for Money Framework, the overall VfM assessment has been based on the consideration of three levels of impacts and the way in which these should be considered within the appraisal metrics.

3.5.2 The initial BCR has been calculated based on the established monetised impacts. This includes the impacts in terms of journey times, VOCs, indirect tax, noise, air quality, greenhouse gases, physical activity, journey quality and accidents and the capital expenditure and ongoing maintenance and renewal costs of the scheme. Table 3.29 below shows the formulation of the initial BCR, and the standard DfT appraisal output tables are included in Appendix K (refer to separate document).

Table 3.29 – Initial BCR

Initial BCR	£m, 2010 PV over appraisal period
Journey time impact	0.37
VOC impact	-1.13
Indirect tax impact	0.08
Noise	2.68

Initial BCR	**£m, 2010 PV over appraisal period**
Air quality	-0.04
Greenhouse gases	-2.11
Physical activity	17.62
Journey quality	2.98
Accidents	-11.89
Capital expenditure (private sector costs)	-7.73
Construction impacts	-1.29
Present Value of Benefits (PVB)	**-0.45**
Capital expenditure (public sector costs)	33.81
Maintenance and renewal costs	2.43
Present Value of Costs (PVC)	**36.24**
Net Present Value (NPV)	**-36.70**

3.5.3 The main sources of benefit are the health and journey quality benefits associated with the uptake in active modes using the shared use path that forms part of the housing access road. There are also some modest transport user benefits associated with journey time savings to highway users as a result of the scheme. However, the accident impact, construction impact and private sector contribution to the scheme costs are of a similar magnitude to these impacts and as such the resultant PVB is -£0.45m. The PVC is £36.24m which accounts for the capital expenditure and ongoing maintenance and renewal costs of the scheme.

3.5.4 Considering the evolving monetised impacts of the scheme, namely reliability, will increase the PVB marginally. This results in an Adjusted BCR of 0.0.

3.5.5 This scheme is not a conventional 'transport scheme', transport infrastructure is required in order to deliver housing (which is one of the key objectives of the MRN fund) and would not necessarily deliver the same benefits as a traditional transport scheme. The scheme will also provide an alternative route to the existing A10, which will offer improved infrastructure and improved quality of life for the residents of West Winch by reducing through traffic (in particular HGVs). However, these benefits are not captured through the conventional transport appraisal, as in terms of journey times the scheme has little impact.

3.5.6 There are substantial benefits attributed to unlocking the housing site. Using these benefits as part of switching value analysis would increase the VfM category from Very Low to **High**.

3.6 Uncertainty Analysis

3.6.1 Sensitivity tests have been run to reflect the indicative impact and the level of uncertainty in input assumptions.

3.6.2 The tests have been undertaken considering appraisal inputs/assumptions linked to scheme costs and the input assumptions that effect the quantification of Land Value Uplift (LVU), that ultimately drive the VfM for the scheme. These tests have been run to understand the sensitivity of expected outcomes to changes in inputs and the potential impact of future uncertainty. The following sensitivity tests have been conducted, drawing on key assumptions made in the Core scenario.

Test 1 & 2: High and low growth assumptions in the modelled scenarios

3.6.3 TAG Unit M4 defines the high (Test 1) and low (Test 2) growth scenarios and outlines the treatment of national growth in traffic demand and the variation of local assumptions with regard to planning (demand) and the local transport network (supply).

Test 3: High level of optimism bias at 46% in line with stage 1 of scheme development

3.6.4 This involves the application of the recommended uplift appropriate for a local authority road scheme at an early stage of scheme development. This sensitivity test applied a 46% uplift to the base capital cost estimate consistent with a scheme at Strategic Outline Case (SOC) stage. This is to reflect how the VfM assessment for the scheme would change in response to any increase in capital costs that may occur.

Test 4: Low level of optimism bias at 20% in line with stage 3 of scheme development

3.6.5 This involves the application of the recommended uplift appropriate for a local authority road scheme at a late stage of development. This sensitivity test applied a 20% uplift to the base capital cost estimate consistent with a scheme at Full Business Case (FBC) stage. This is applied to inform how the VfM assessment for the scheme would change in response to a decrease in scheme costs.

Test 5: High house price growth at 5.1% per annum, applied within the LVU model

3.6.6 The Core scenario assumes a 3.41% annual increase in local house prices to estimate the GDV from the delivery of housing units dependent on the scheme. This scenario reflects future uncertainty associated with fluctuating house prices at a local level and how this ultimately effects LVU from the scheme. 5.1% growth in house prices per annum, a 50% increase on the Core scenario growth, has been applied to inform how the VfM assessment for the scheme responds to an increase in land value.

Test 6: Low house price growth at 1.7% per annum, applied within the LVU model

3.6.7 This scenario tests the vulnerability of the scheme to future uncertainties linked to lower-than-expected house price growth in the local property market. The Core scenario assumes a 3.41% annual increase in local house prices,

drawn from average house price growth in the local area over a 10-year period. 1.7% growth in house prices per annum, a 50% reduction of the Core scenario growth, has been applied to inform how the VfM assessment for the scheme responds to a slower than expected increase in land value.

Test 7: High additionality for the LVU model at 75%

3.6.8 This scenario involved the application of high additionality for the scheme and has been reflected through a measured reduction in the level of displacement.

Test 8: Low additionality for the LVU model at 50%

3.6.9 This scenario involved the application of low additionality for the scheme and has been reflected through a measured increase in the level of displacement.

3.6.10 Table 3.30 shows the impact on the PVB, PVC and VfM category of each of these tests compared to the Core scenario. These tests have been run assuming the benefits of the dependent development are also included.

3.6.11 As the sensitivity test results include the overall VfM considering Level 1, 2 and 3 impacts, the high growth test (Test 1) shows a decrease in PVB compared to the core scenario due to the TECs being higher as a result of the higher demand. Similarly, Test 2 shows an increase in PVB given the positive impact of the lower levels of demand on the transport external costs. Tests 3 and 4 show that with increases and decreases in costs the VfM category remains High. The VfM is most sensitive to changes in the assumption of house price growth, with more conservative assumptions reducing the VfM to Poor and more optimistic assumptions increasing this to Very High. The displacement assumption for the core scenario has been calculated using DLUHC guidance and falls within the 50%-75% category. If the upper bound value were used (Test 7) the PVB would increase but the VfM would remain in High. If the lower bound value were used (Test 8) the VfM category would reduce to Medium. As discussed previously, the core scenario assumption for additionality assumes a relatively high level of displacement given the constraints to deliver housing of this scale in the local area, therefore it is

considered unlikely that the displacement level will be lower than the core scenario.

Table 3.30 – Sensitivity tests

Sensitivity tests	**£m, 2010 PV over appraisal period**	**£m, 2010 PV over appraisal period**	**£m, 2010 PV over appraisal period**
Test	**Level 3 PVB**	**Level 3 PVC**	**VfM category**
Core scenario	84.49	36.24	High
Test 1	81.36	36.24	High
Test 2	92.49	36.24	High
Test 3	80.93	40.56	High
Test 4	82.94	33.33	High
Test 5	178.73	36.24	Very High
Test 6	12.02	36.24	Poor
Test 7	98.53	36.24	High
Test 8	59.83	36.24	Medium

3.7 Distributional Impacts

3.7.1 In accordance with TAG Unit A4-2 Distributional Impact Appraisal, a distributional impact analysis has been undertaken to determine whether the scheme unduly favours or disadvantages particular social groups.

3.7.2 The Distributional Impacts (DI) appraisal considers the variance of impact across different social groups with protected characteristics, rather than the overall impact of the scheme on different indicators as outlined in the social impact appraisal. The social groups that form the basis for the DI appraisal are outlined below. These groups exhibit specific characteristics that are protected by the Equalities Act 2010 (source: UK Government (2010) Equalities Act 2010, which can be found on the Legislation.gov website).

- Children and young people
- Older people

- Carers
- Women
- Disabled
- Black and Minority Ethnic (BME)
- Socio-economic deprivation

3.7.3 The DI appraisal follows a three-step approach to identify the likely impacts of the scheme on different social groups. This involves an initial screening process to identify the likely impact of the scheme in relation to the following social, environmental and economic outcomes:

- Transport user benefits
- Noise
- Air quality
- Accidents
- Security
- Severance
- Accessibility
- Personal Affordability

3.7.4 The results of the screening process are outlined in the Distributional Impact Report in Appendix L (refer to separate document). Accessibility and security did not proceed to the DI assessment and appraisal stage on the basis that the scheme does not include any measures that materially change the availability or accessibility of public transport services, nor does it result in any change that would substantially affect user perceptions of personal security.

Appraisal of Impacts

3.7.5 The approach for the grading of DIs for each of the identified social groups is outlined in TAG Unit A4-2 and is shown in Table 3.31. In general, the distributional assessment and appraisal is based on the scale and scope of scheme impacts which is then combined with the proportion of social groups in the impact area compared to the national average. This gives a detailed picture of the impact of the scheme on different social groups.

3.7.6 For each indicator the DI assessment has been undertaken by comparing the same scenarios as for the core scenario appraisal, such that the DI analysis is showing the distribution of these overall impacts. Details of the scenarios being compared are set out in Section 3.4.

Table 3.31 – Approach for grading Dis for each of the identified social groups

Impact	Assessment
Beneficial and the population impacted is significantly greater than the proportion of the group in the total population	Large Beneficial
Beneficial and the population impacted is broadly in line with the proportion of the group in the total population	Moderate Beneficial
Beneficial and the population impacted is smaller than the proportion of the group in the total population	Slight Beneficial
There are no significant benefits or disbenefits experienced by the group for the specified impact	Neutral
Adverse and the population impacted is smaller than the proportion of the population of the group in the total population	Slight Adverse
Adverse and the population impacted is broadly in line with the proportion of the population of the group in the total population	Moderate Adverse

Impact	Assessment
Adverse and the population impacted is significantly greater than the proportion of the group in the total population	Large Adverse

3.7.7 A full appraisal of DIs of the scheme is contained in the DI appraisal matrix shown in Table 3.32. The overall assessment score for each DI is recorded in the AST, along with qualitative statements to understand the full impacts of the scheme on different groups of people.

3.7.8 Further details on the assessment and appraisal stages of the distributional impact assessment for the scheme are provided in Appendix L (refer to separate document).

Table 3.32 – DI appraisal matrix

Impacts	Distributional impact of income deprivation	Distributional impact of income deprivation	Distributional impact of income deprivation	Distributional impact of income deprivation	Distributional impact of income deprivation	Are the impacts distributed evenly?	Key impact – Qualitative statement
Percentage	**0-20%**	**20-40%**	**40-60%**	**60-80%**	**80-100%**	**Not applicable**	**Not applicable**
User benefits	Large beneficial	Slight beneficial	Moderate beneficial	Large beneficial	Moderate beneficial	No	Although benefits are felt by all income quintiles, the benefits favour those in the most deprived income quintile. Those in the least deprived income quintiles (income quintile 4 and 5) also experience a higher-than-expected proportion of the benefits, whereas those in more deprived areas (quintile 2 and 3) experience a smaller than expected proportion of the benefits. Overall, the user benefit impact is appraised to be **moderate** beneficial for all income groups within the KLTM core modelled area as there is a significant reduction in traffic on the A10 and A47 from scheme implementation. This provides an alternative route for strategic traffic trying to access the A47. The dualling of the A47 also reduces travel time within the study area that results in a reduction in fuel and non-fuel user costs.
Noise	Neutral	Not Applicable	Slight beneficial	Large beneficial	Not Applicable	No	Positive benefits from noise assessment are experienced by the people of 3rd and 4th quintile. It might be because of the fact that with the scheme in place the existing noise level created due to the traffic congestion in A10 and A47 has reduced due to the reduction in congestion in the existing roads.
Air quality	Moderate beneficial	Not Applicable	Large beneficial	Large beneficial	Slight beneficial	No	Large benefits are felt by the people under 3rd quintile. People under quintile 1, 4 and 5th quintile are experiencing disbenefits by the scheme in terms of air quality.
Affordability	Slight beneficial	Large beneficial	Moderate beneficial	Large beneficial	Moderate beneficial	Yes	Personal affordability benefits are felt by all income quintiles. Except for the most deprived income quintile (income quintile 1) benefits are experienced by all other income quintiles in line or greater than the proportion of the group in the population. Less benefit is experienced by the most deprived income group. Given two of the quintiles are largely benefiting in terms of personal affordability and two are moderately benefiting (income quintiles 2 and 4), the scheme is deemed to have a **moderate** beneficial impact.

Not applicable	Social Groups	Social Groups	Social Groups	Social Groups	Social Groups	Social Groups	User Groups	User Groups	User Groups	User Groups	Not applicable
Impacts	**Children & young people**	**Older people**	**Carers**	**Women**	**Disabled**	**BME**	**Pedestrian**	**Cyclist**	**Motorcyclist**	**Young male drivers**	**Qualitative statement (including any impact on residential population and identified amenities)**
Accidents	Neutral	Neutral	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Neutral	Neutral	Moderate beneficial	Moderate beneficial	Comparing to the past accident data there was a higher proportion of older people aged 65 and over involved in accidents compared to the national average. In terms of impact of the scheme roads like the A10, Constitution Hill, Rectory Lane show neutral impact on the forecast number of accidents. There are significant accident benefits at the Hardwick Interchange. Overall, none of the links within the study area have a proportion of casualties of vulnerable groups higher than the national average. Consequently, most of the ARN shows a **neutral** impact on vulnerable groups in terms of accidents, with pockets of moderate and slight benefits and adverse effects on accidents from scheme implementation.
Severance	Neutral	Neutral	Not Applicable	Not Applicable	Slight beneficial	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Within the study area the proportion of older people and people with disabilities are more than the national average. Most of the road links present in the study area show decreases in the AADT flow. Particularly along A10, there is a larger than 10% decrease in AADT flows due to reduction in speed limit to 30mph. Only the links around Hardwick interchange show increases in AADT. Overall, where the road links shows benefit in terms of change in AADT, the scheme is appraised to be **neutral** considering the fact that the concentration of vulnerable groups are less here, so there is less chance of getting impacted by severance.

3.8 Place-Based Analysis

3.8.1 DfT released TAG Unit A4-3 in November 2022, setting out the need to undertake place-based analysis as part of the appraisal of a scheme. Place-based analysis considers the spatial distribution of the scheme impacts, whereas DI analysis considers the impacts on different social groups within an area.

3.8.2 Place-based analysis has been undertaken for transport user benefits, the development impacts and social and environmental impacts. Table 3.33 summarises the findings of the place-based analysis with the detailed outputs included within the Place-Based Analysis Report in Appendix M (refer to separate document).

Table 3.33 – Place-based analysis summary

Impact	Place-based analysis findings
Transport user impacts	The northern part of the study area represented by South Lynn, Hardwick Narrow, West Winch, Setchey, Middleton, East Winch and West Bilney shows benefit for transport users due to the proposed housing access road (provided by the scheme) and the dualling of the A47 on the approach and exit to Hardwick Interchange. The southern part of the study area represented by Terrington St John, St John Highway, Wiggenhall St Germans, Watlington, Tottenhill, Marshall Airfield, Nordelph, West Dereham Shouldham, West Norfolk and Narborough. This area shows some disbenefits due to the increased journey time travelling north south. This may be due to the implementation of traffic calming measures (speed restrictions, crossing points) on the A10 corridor.
Temporary construction impacts	Costs may be more significant in the immediate vicinity of the scheme. Some areas are estimated to experience negative impacts due to increased journey times when travelling east to west, possibly due to the increased congestion from traffic attempting to access strategic routes via the A47.
Wider economic impacts – Transport External Costs (TECs)	Wider Economic Impacts has been assessed under dependent development (dynamic land use assumptions) for TECs. Within the scope of the PBA, the TECs shows all LSOAs within the study area experiencing disbenefit from the additional travel demand generated from the development site. The spatial distribution of the TECs are concentrated in areas in the immediate vicinity of the scheme and for origins and destinations to the north and south of the study area.
Social impacts	**Accidents** Main roads like Constitution Hill, West Winch Road, Rectory Lane show a +/-5% change in number of accidents as a result of the scheme due to the reduction of speed, the introduction of a controlled roundabout along the A10 and traffic calming measures along the A10. Therefore, the majority of the ARN shows neutral impact in terms of accidents attributed to scheme implementation. A specific part of the Hardwick Interchange and Chequer's Lane show increases in the number of accidents. **Affordability** Affordability in terms of non-business (commuting and leisure) purposes shows that the eastern part of the study area including LSOAs represented by West Winch, Middleton, West Bilney, Narborough and Gayton show a benefit in terms of VOCs. This is expected to be the result of strategic traffic re-routing away from the A10 onto the WWHAR to access further afield destinations on the A47. This is expected to reduce VOCs for transport users travelling east to west. The western and south-western part of the study area shows disbenefit in terms of affordability. These locations are possibly impacted by speed restrictions on the housing access road, which is also a longer, alternative route compared to the current A10. This is likely to increase VOCs for transport users living and working in these areas. In terms of affordability considered under dynamic land use assumptions (comparing Scenario S and Scenario R) all LSOAs experience a disbenefit but at a lower overall value than under fixed land use in terms of VOCs. **Severance** With the introduction of additional crossings on the A10 and the introduction of traffic calming there is anticipated to be a positive impact in terms of severance. Major benefits in terms of severance to be experienced within proximity of the scheme, particularly for residents of the village of West Winch. There are not anticipated to be significant severance impacts experienced in the wider area.

Impact	Place-based analysis findings
Environmental impacts	**Noise** In total there are 1,366 properties within 600m of the scheme extent and the A10. Approximately 70% of properties or receptors in the study area will experience a decrease in noise levels in 2042 in the with scheme scenario. Noise levels are predicted to increase at the receptors close to the scheme where existing baseline noise levels are low. However, noise level reductions are anticipated at a much greater number of receptors along the A10 as a result of less vehicles using the A10 in favour of the scheme in both the opening and forecast years. **Air Quality** The local air quality appraisal finds that there are approximately 2,687 properties within 200m of the ARN. These properties are situated in the built-up area of West Winch village and close to wider links that border the outskirts of King's Lynn town centre. Dispersion modelling finds that the majority of properties within 200m of the ARN will experience no change in NO_2 or $PM_{2.5}$ concentrations from scheme implementation. The model results also find that 18.7% and 16.3% of properties in the study area will experience an improvement in NO_2 and $PM_{2.5}$ concentrations, respectively, compared to 7.2% and 4.4% that will experience a net deterioration in local air quality from higher concentrations of NO_2 and $PM_{2.5}$. **Landscape** With the scheme and it's associated development there will be an increase in local traffic flow, noise, and light pollution is anticipated in close proximity to the scheme. **Townscape** As the assessment of townscape concludes that there is a neutral impact of the scheme, no PBA has been undertaken for this indicator. **Historic Environment** There are eleven designated heritage assets within the 1km of study area, all of which are listed buildings (one listed Grade I, one listed Grade II* and nine listed Grade II). The assessment also included a rapid review of non-designated heritage assets on the Norfolk Historic Environment Record (NHER). The effects are neutral with mitigation to avoid physical contact with a non-designated heritage site at Ficham Manor. The impact of the scheme is negligible on the form, survival and condition of historic assets. **Biodiversity** With the scheme and it's associated development, loss of vegetative cover and loss of habitat are likely to be experienced in the study area. The habitat of protected species like bats and wild birds could be impacted due to the pollution and construction work of the scheme. This is likely to result in a slight adverse impact, but the presence of A10 as a physical barrier to the west of the study area will help in neutralising the impact on biodiversity beyond A10. Overall, the scheme is anticipated to be moderate adverse for the biodiversity of the surrounding area. **Water Environment** The River Nar, and its tributaries with several ordinary surface waterbodies including Country Drain and tributaries, Middleton Stop Drain, Pierpoint Drain, and land drains and ditches are located within 1km of the scheme. Though there is a potential of the scheme to impact the hydro-morphological quality of water features as well as impacting the ground water via construction runoff, it is assumed that the mitigation measures will neutralise this potential impact.

3.9 Value for Money Statement

3.9.1 Overall, this scheme is assessed to be **High VfM**, when considering the established, evolving and indicative monetised impacts, and also the non-monetised impacts of the scheme.

3.9.2 The initial BCR for the scheme, based on the established monetised impacts only, is less than 0.0 demonstrating very poor VfM. The main sources of benefit being the health and journey quality benefits associated with the uptake in active modes using the shared use path that forms part of the housing access road. There are also some modest transport user benefits associated with journey time savings to highway users as a result of the scheme. However, the accident impact, construction impacts and private sector contribution to the scheme costs are of a similar magnitude to these impacts and as such the resultant PVB is -£0.45m.

3.9.3 The PVC is £36.24m which accounts for the capital expenditure and ongoing maintenance and renewal costs of the scheme. The PVC has been calculated using the risk-adjusted cost for the capital expenditure and an optimism bias adjusted cost for the ongoing maintenance and renewal costs.

3.9.4 Considering the evolving monetised impacts of the scheme, namely reliability, will increase the PVB marginally. This results in an Adjusted BCR of 0.0.

3.9.5 This scheme is not a conventional 'transport scheme', transport infrastructure is required in order to deliver housing (which is one of the key objectives of the MRN fund). The scheme is estimated to generate a LVU benefit of £118.64m (2010 PV, market prices), where the land is converted into a more economically valuable land use. This uplift accounts for the costs of the development, including housing and wider education, community and green infrastructure measures. In addition there are health benefits associated with the delivery of affordable housing. Over the appraisal period these benefits are considered to be £0.07m (2010 PV, market prices). There is also an amenity impact associated with developing the land. There will be a loss of amenity as a result of the developed area coming forward on greenfield land,

but also some gain whereby green infrastructure is delivered as part of the scheme which has a higher amenity value than the current agricultural use. The overall impact on amenity is estimated to be -£16.59m (2010 PV, market prices). The impact on the highway network of the increased demand from the housing site is captured through the Transport External Costs, over the 60-year appraisal period these amount to -£17.68m (2010 PV, market prices). There are substantial benefits attributed to unlocking the housing site. Using these benefits as part of switching value analysis would increase the VfM category to High.

3.9.6 There are a number of environmental and social indicators which have been assessed qualitatively. Where the scheme will be constructed through greenfield land there are likely to be impacts on the landscape, given the localised nature of the scheme these impacts are considered to be slight adverse, and there is opportunity for mitigation. There is anticipated to be a beneficial impact on severance, with the scheme reducing strategic through traffic on the A10 and improving the infrastructure for pedestrians and cyclists within West Winch.

3.9.7 Sensitivity testing has shown that the VfM of the scheme is most influenced by the house price growth assumption which underpins the GDV calculation. The remaining tests demonstrate the scheme can withstand increases in costs and changes in additionality assumptions and continue to demonstrate VfM.

3.9.8 At this stage, and as presented in this Business Case, it is anticipated that the scheme will deliver significant quantified and non-quantified benefits and provide VfM for public sector expenditure.

4 Financial Dimension

4.1 Introduction

4.1.1 The Financial Dimension considers the affordability of the proposed scheme. It presents the costs of the scheme and the proposed funding sources. This Financial Dimension has been developed in line with guidance from the DfT TAG Unit A1-2.

4.2 Scheme Costs

Capital Expenditure

4.2.1 The costs of developing and delivering the WWHAR scheme have been estimated using the preliminary design information at this OBC stage. This estimate considers the construction costs, professional fees, utilities, and land costs of the scheme. The construction costs have been estimated based on a bill of quantities and the application of cost rates. The cost rates are largely sourced from SPONS Civil Engineering and Highways. The rates are based on the Q4 2022 release and have been rebased to Q2 2023 prices using the Building Cost Information Service (BCIS) Tender Price Index (TPI) rates. More locally specific cost rates have been used for earthworks and tarmac costs. These direct construction costs have informed the estimation of indirect construction costs for preliminaries (27.5% of direct construction costs), traffic management (5.0% of direct construction costs), contractors' risk (4.5% of direct construction costs) and contractors' overheads and profit (10% of direct construction costs). These uplifts are based on NCCs experience of delivering schemes of this nature.

4.2.2 Further allowances have then been applied to reflect costs associated with:

- **Professional fees:** 30% of construction cost (including direct and indirect costs), this includes project and design team fees and project management fees. This allowance is based on NCCs historic evidence of these costs for schemes, and includes costs incurred to date developing the scheme.

- **Utilities:** these costs have been considered in terms of standard utility costs to providers (£1.05m, 2023 prices) and the cost of the main gas diversion works estimated by National Grid (£6.41m, 2023 prices).
- **Ground investigation:** costs associated with ground investigation and archaeological trial trenching (£0.63m, 2023 prices). These costs have been estimated based on NCCs experience and historic cost analysis for similar schemes.

4.2.3 The land costs associated with the scheme have been estimated considering the individual parcels of land and the costs associated with acquisition, loss payments, severance and disturbance payments, agents and legal fees. The total land cost is estimated to be £9.24m (2023 prices).

4.2.4 A risk adjustment has been applied to the total costs to reflect future uncertainty. A Quantified Risk Assessment (QRA) has been undertaken, using the project risk register. From the QRA, a Monte-Carlo simulation has been run to optimise the risk assessment and analyse the sensitivities surrounding the risk allocations used. The P80 estimate output from the QRA was £15.61m. This value was compared to the risk percentage that NCC have experienced when developing and delivering schemes similar to this and reflecting the status of the design. This risk percentage was 25% which, when applied to the scheme costs, is equivalent to £15.63m. This demonstrates a consistent risk cost estimate regardless of a bottom-up (QRA) or top-down (risk percentage). For the purposes of the Financial Dimension the risk cost estimated by percentage has been used to inform the scheme costs, as this is considered to be more conservative with a slightly higher allowance. Section 6.9 of the Management Dimension includes further detail of the risk management process for the project.

4.2.5 Table 4.1 shows the capital expenditure by each of the line items discussed previously.

Table 4.1 – Capital expenditure by cost line item (£m, Q2 2023)

Cost category	£m
Construction costs, preliminaries, traffic management and contractors risk, overheads and profit	37.61
Professional fees	8.23
Utilities	7.46
Land	9.24
Risk	15.63
Total (Q2, 2023)	**78.17**

4.2.6 Inflation has been added to the costs to reflect the cost in the year in which they are incurred based on the current programme set out within the Management Dimension. To convert the 2023 cost estimate to outturn costs, inflation has been applied based on different forecasts depending on the cost line item. For construction, utilities and risk costs the BCIS General Civil Engineering Cost Index July 2023 forecast has been used. For professional fees and land costs an inflation figure of 2.5% per annum has been used, this is based on forecasts of the Consumer Price Index (CPI).

4.2.7 In addition to this, an inflation contingency of 0.10% per year has been applied to the inflation forecasts for the construction, utilities and risk costs to reflect the continued uncertainty over forecasts. Table 4.2 below shows the inflation levels applied to the scheme costs over the design and construction period.

Table 4.2 – Inflation forecasts

Year	2023/24	2024/25	2025/26	2026/27	2027/28
BCIS General Civil Engineering Cost Index (cumulative)	2.41%	4.48%	6.89%	9.55%	12.21%
CPI (cumulative)	2.50%	5.06%	7.69%	10.38%	13.14%
Inflation contingency (in each year)	0.10%	0.10%	0.10%	0.10%	0.10%

Year	2023/24	2024/25	2025/26	2026/27	2027/28
Inflation values for construction, utilities and risk costs (BCIS + contingency)	**2.51%**	**4.58%**	**6.99%**	**9.65%**	**12.31%**
Inflation values for professional fees and land costs (CPI)	**2.50%**	**5.06%**	**7.69%**	**10.38%**	**13.14%**

4.2.8 Table 4.3 shows the capital expenditure estimate once adjusted for inflation. Appendix N (refer to separate document) shows the detailed breakdown of the cost estimate by scheme element and line item. Given the commercially sensitive nature of the land cost estimates these are not included within the Appendix but can be discussed with DfT if required.

Table 4.3 – WWHAR scheme cost estimates (£m, 2023)

Cost category	£m
Capital expenditure (£Q2, 2023)	78.17
Inflation	6.29
Total (£m, nominal)	**84.47**

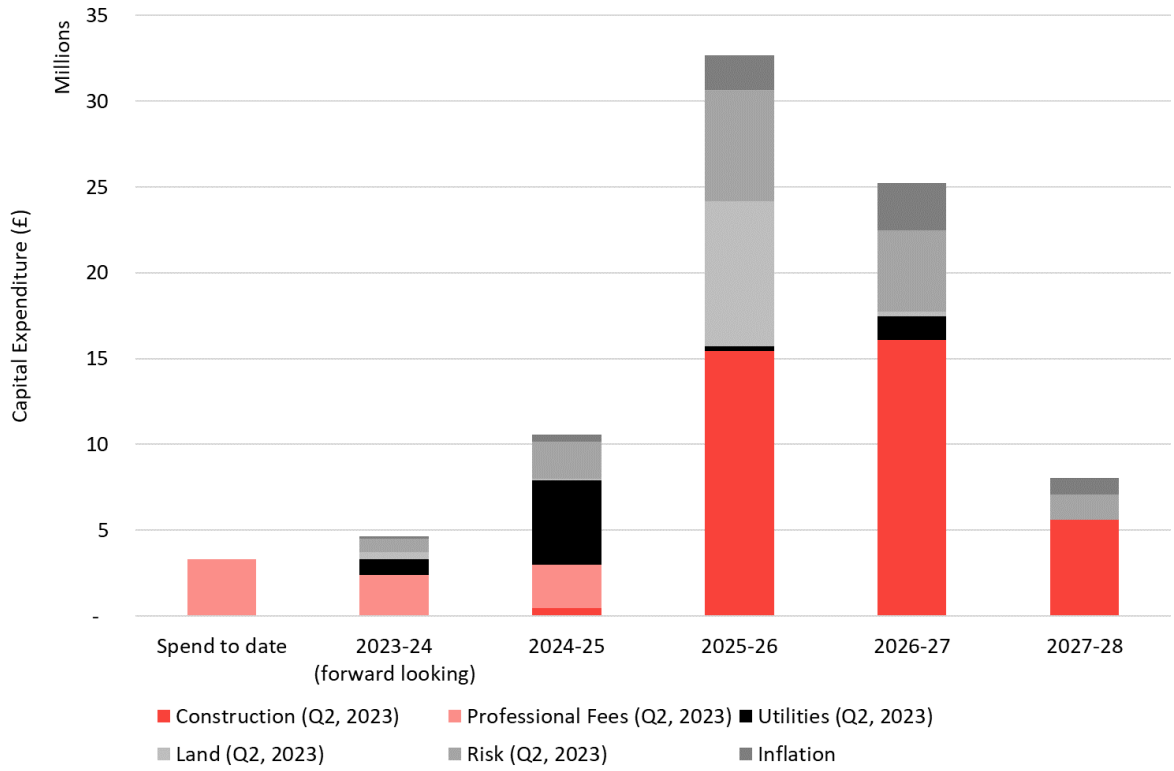
Cost Profile

4.2.9 Costs have been profiled over the design and construction period based on the project programme included in Section 6.5 of the Management Dimension. Table 4.4 shows the cost in each year for the scheme, and Figure 4.1 shows how this is comprised of the various cost elements.

Table 4.4 – WWHAR scheme cost profile

Cost (£m)	Spend to date, includes spend up to August 2023	2023/24, includes spend from August 2023 for remainder of 2023/24	2024/25	2025/26	2026/27	2027/28	Total
Construction (£Q2, 2023)	Not applicable	Not applicable	0.47	15.43	16.10	5.60	**37.61**
Professional fees (£Q2, 2023)	3.31	2.39	2.54	Not applicable	Not applicable	Not applicable	**8.23**
Utilities (£Q2, 2023)	Not applicable	0.93	4.89	0.26	1.37	Not applicable	**7.46**
Land (£Q2, 2023)	Not applicable	0.40	0.10	8.49	0.24	Not applicable	**9.24**
Risk (£Q2, 2023)	Not applicable	0.79	2.14	6.47	4.74	1.50	**15.63**
Inflation	Not applicable	0.13	0.43	2.00	2.79	0.95	**6.29**
Total (£ nominal)	**3.31**	**4.64**	**10.58**	**32.66**	**25.24**	**8.04**	**84.47**

Figure 4.1 – Capital expenditure cost profile by cost line item



Maintenance and Renewal Costs

4.2.10 There will be maintenance and renewal costs associated with the housing access road. At this stage of Business Case development these costs have been considered as a proportion of the construction costs. The annual costs are assumed to be 0.4% of the construction costs based on benchmarks observed on similar schemes. Over the 60-year appraisal period this gives a total maintenance and renewal cost of £9.03m (2023 prices), and £20.15m (nominal) after inflation. These costs are assumed to be incurred by the local authority and covered through their maintenance budget.

4.3 Budget and Funding

4.3.1 Work undertaken as part of the Infrastructure Development Plan (IDP) for South East King's Lynn Strategic Growth Area, Borough Council of King's Lynn and West Norfolk, prepared in October 2018, identified that it was not viable for the housing development to fund the construction of the housing

access road in full. Therefore, public sector funding from the MRN/Large Local Major (LLM) Fund is sought to fill this gap.

4.3.2 NCC and BCKLWN have provided development funding for the project to date. In addition to the £0.70m OBC funding secured from the DfT, local contributions of £3.45m have been contributed to the fees associated with scheme development.

4.3.3 It is assumed that £14.65m (nominal) will be contributed from the developer towards the delivery of the housing access road. This contribution will be in the form of a loan from Homes England which the developer will repay once the housing comes on stream. The contribution will be used to fund utilities work and land only.

4.3.4 The remainder of the forward looking funding, £65.67m, is sought from the DfT's MRN/LLM fund. The fund guidance states that there should be at least a 15% local or third-party contribution to the scheme costs. Based on the total scheme cost of £84.47m, the local and third party contribution is 21% of this, exceeding the threshold set out in the guidance.

4.3.5 Based on the programme set out in Section 6.5 of the Management Dimension, there will be costs associated with land, utilities and scheme development incurred prior to the release of funding from both DfT and Homes England. These costs will be funded by NCC at risk and will be reimbursed once the funding is released from central Government.

4.3.6 Table 4.5 shows the funding by source in each year compared to the cost profile, highlighting where there will be a negative cost (income) to NCC when funding from central Government is released.

4.3.7 The signed Section 151 (s151) officer letter is included in Appendix O (refer to separate document).

Table 4.5 – Cost profile by funding sources (£m, nominal)

Year	Spend to date, includes spend up to August 2023	2023/24, includes spend from August 2023 for remainder of 2023/24	2024/25	2025/26	2026/27	2027/28	Total
Local contribution	2.61	0.84	Not applicable	Not applicable	Not applicable	Not applicable	**3.45**
DfT OBC funding	0.70	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	**0.70**
NCC forward funding (land and utilities)	Not applicable	1.34	(1.34)	Not applicable	Not applicable	Not applicable	Not applicable
NCC forward funding (fees, construction, risk, inflation)	Not applicable	2.46	(2.46)	Not applicable	Not applicable	Not applicable	Not applicable
DfT MRN/LLM Fund	Not applicable	Not applicable	8.04	24.34	25.24	8.04	**65.67**
Developer contribution	Not applicable	Not applicable	6.34	8.31	Not applicable	Not applicable	**14.65**
Total	**3.31**	**4.64**	**10.58**	**32.66**	**25.24**	**8.04**	**84.47**

4.4 Summary

4.4.1 The costs of developing and delivering the WWHAR scheme have been estimated using the preliminary design information at this OBC stage. This estimate considers the direct and indirect construction costs, professional fees, utilities, and land costs of the scheme. The construction costs have been estimated based on a bill of quantities and the application of cost rates. These costs have then been uplifted to reflect the additional costs of the scheme. The costs have been adjusted for risk and inflation. The cost estimates have been informed by NCCs experience of delivering similar schemes.

4.4.2 The total scheme cost is estimated to be £84.47m (nominal) including spend to date. £3.45m of these costs have been funded through local contribution, and £0.7m has been contributed from DfT towards the development of the OBC. The forward looking costs will be funded through £14.65m of developer contribution and £65.67m sought from the DfT's MRN/LLM Fund. This shows local and third-party contribution to the scheme costs in excess of the 15% threshold set out in the fund guidance. Costs in the remainder of 2023/24 and part of 2024/25 will be incurred by NCC at risk, prior to confirmed funding from DfT and Homes England. These funds will then be reimbursed once funding is unlocked from central Government.

4.4.3 There will be additional maintenance and renewal costs as a result of the scheme. These have been estimated assuming these costs will be equivalent to a proportion of the scheme construction costs. Over the 60-year appraisal period these costs are estimated to be £20.15m (nominal) and are assumed to be incurred by NCC.

5 Commercial Dimension

5.1 Introduction

5.1.1 The Commercial Dimension outlines the approach taken to assess the feasibility and practicability of delivering the WWHAR scheme. It provides

evidence of the commercial viability of the proposed scheme and describes the potential procurement strategies that will be used to engage the market.

5.1.2 The Commercial Dimension is structured in line with the *'Transport Business Case: assessment and process procedures' guidance* from the DfT and sets out:

- An output-based specification, summarising the scheme in terms of outcomes and outputs
- Options for procurement and purchasing, including procurement models, route to market, contracting strategy and contract type
- The approach to risk allocation and transfer
- Human resource considerations

5.1.3 Consideration is currently being given to the preferred procurement option and contracting strategy. The restricted timescales of the MRN funding window limit the viability of certain options available to NCC.

5.2 Output-Based Specification

5.2.1 This section summarises the scheme's functional requirements in terms of outcomes and outputs, in line with the scheme objectives set out in Section 2.6. Table 5.1 captures the design and planning, construction and operational phases of the WWHAR scheme.

Table 5.1 – Output-based specification and desired scheme outcomes

Stage	Outputs	Outcomes
Design and Planning	▪ Detailed design for the WWHAR scheme ▪ Development of the scheme design and preparatory works design ▪ Development of the scheme Business Cases ▪ Surveys and ground investigations ▪ Advance works- including utility diversions and other enabling works ▪ Project management	▪ Support sustainable economic growth ▪ Support and enable housing delivery ▪ Improve east-west connectivity ▪ Improve journey time reliability and network resilience ▪ Deliver better environmental outcomes, such as improved local air quality ▪ Decisions supported by an appropriate level of stakeholder engagement and technical assurance ▪ Compliance with the LTP gateway process
Construction	Construction of the 2.4km route of new highway infrastructure connecting the A10 to the A47. Outputs include: ▪ Signalised roundabouts at the northern and southern tie-in points ▪ Reconfiguration to the Hardwick Interchange ▪ Dualling of the existing A47 between Hardwick Interchange and the access road ▪ Treatment of local roads served by access road ▪ Signalised crossing points ▪ Bus priority measures ▪ New pedestrian / cycle route	▪ Access to the Hardwick Green (i.e., Hopkins Homes) planned development ▪ Accommodation of additional traffic from housing growth ▪ Improve east-west connectivity ▪ Support delivery of West Winch Housing Allocation and Strategic Growth Area

Stage	Outputs	Outcomes
Operations and Maintenance Services	▪ New highway infrastructure, active travel routes and bus priority measures within West Winch, connecting the existing A10 to the A47	▪ Enhance connectivity for pedestrians and cyclists to the wider public transport network ▪ Enable access to the West Winch site ▪ Ensure safety for all road users

5.3 Procurement Strategy

5.3.1 This section highlights the available procurement strategy options for the WWHAR scheme. It considers the criteria which could be used to determine the optimal procurement strategy and provides an overview of traditional and design and build procurement strategy options.

Procurement Criteria

5.3.2 Table 5.2 provides a list of the suggested procurement criteria relevant to the proposed scheme, which will support the selection of an optimal procurement strategy, and ultimately contractors needed for the delivery of the scheme.

5.3.3 As the scheme design and planning develops over the project's lifecycle, these criteria will be reviewed at each stage with consideration given to their continued relevance.

Table 5.2 – Procurement criteria

Criteria	Consideration
Cost Certainty	Delivery of the scheme within the agreed funding constraints, achieving the most economically advantageous outcome for NCC.
Programme	The overall delivery schedule (including procurement, design and construction) with consideration of key milestones ensuring delivery to MRN timescales.
Preparation Costs Minimisation	Ensure preparation costs are managed proactively, avoiding duplication of design work, seeking overall opportunities to reduce costs while achieving the required outcomes.

Criteria	Consideration
High-Quality Infrastructure	Delivery of quality outputs in line with NCC required standards. This includes both construction standards, as well as end user-experience.
Complexity/ Deliverability	Scheme delivery within identified constraints with appropriate levels of delivery resilience, dependency on third parties, separate contracts and sub-contractors, the extent of unique or unusual features, the scale of the project.
Risk	Ensure risk is allocated fairly based according to who is best able to manage risk, with an NCC appetite to retain risk or incentivise contractors to manage risk appropriately
Potential for change	Fixity of design achieved before procurement leading to the minimisation of change costs.
Complementary skillset	Ensuring all delivery partners can evidence relevant expertise and capacity for design delivery, complementing the existing delivery team.
Value for Money / Innovation / Whole-life costs	Ensure appropriate Value for Money while encouraging allowing innovation and consideration of whole-life costs.
Relationships	Ensure the commercial strategy supports the creation of collaborative relationships between the parties to the contract.
Sustainability / Environment	Ensure the scheme is developed in a sustainable way that minimises the impact on the environment, with a particular focus on delivering in line with the Carbon Management Plan (refer to separate document, see Appendix P)
Social Value	To ensure that construction in Norfolk contributes to the economic, social, and environmental wellbeing of the area, building on the Social Value Act 2012.
Control	Ensure that NCC retains control over the final scheme details.

Procurement Model Options

5.3.4 A key early decision to be made is whether to make use of an existing framework arrangement or whether to pursue an open tender route. Reflecting NCC's current contract experience and the characteristics of the scheme, it is currently envisaged that the following options will be considered:

- Traditional (Lump Sum)
- Traditional (Measurement)

- Design and Build

5.3.5 Due to the scale of the WWHAR scheme, a partnering and alliancing procurement strategy has not been considered at this time.

5.3.6 The advantages and disadvantages of each procurement strategy are summarised in Table 5.3.

Table 5.3 – Procurement model options

Procurement Model	Advantages	Disadvantage
Public Ownership (NCC owned – maintained by contractors)	***Public Ownership (NCC owned – maintained by contractors)***	***Public Ownership (NCC owned – maintained by contractors)***
Traditional (Lump Sum) Single Stage Consultant develops design in partnership with Client before competitive tenders are invited and before the main works contract is let. The contractor appointed to deliver works (possibly including some level of contractor design post-award) under a lump sum or a re-measurable contract.	▪ Well-established procurement route in existing frameworks and NEC (e.g. options A and C) ▪ The client develops the specification, manages risk, and retains control and flexibility to change the specification ▪ Award of contract on the lowest price basis /best value demonstrating Value for Money (potentially using quantities which may vary at completion) ▪ More control over design ▪ Construction costs can be accurately determined in advance	▪ Less incentive for a contractor to innovate ▪ No link between design and construction or contractor input to design ▪ The nature of risks is not fully realised at the point of award resulting in the potential for an increase in outturn cost and delays with completion ▪ A detailed design is required in advance of procurement, which may require a longer programme
Traditional (Measurement) Single Stage Consultant develops design in partnership with Client before competitive tenders are invited and before the main works contract is let. contractor appointed to deliver works (possibly including some level of contractor design post-award) under a re-measurable contract.	▪ Well established procurement route in existing frameworks and NEC (e.g. options B and D) ▪ Potential time savings during pre-construction – can be procured on a lower level of detail within the design ▪ Drives competitive prices based on a schedule of rates and approximate quantities ▪ Award of contract on the lowest price basis /best value demonstrating Value for Money using quantities – this may vary at completion ▪ The contractor assumes responsibility and financial risk for the delivery of the design	▪ Poor price certainty - construction costs cannot be accurately determined in advance ▪ Less incentive for a contractor to innovate ▪ No link between design and construction or contractor input to design ▪ Can create an adversarial relationship between the contract parties ▪ Further detailed design post contractor award may result in programme delays
Design and Build The main contractor is appointed to design and construct the works. They act as a single point of responsibility for delivering the project. Either a single-stage or two-stage tender process can be used to procure and appoint.	▪ Integration of design and construction leads to efficiencies in cost and time ▪ Single point of responsibility for the Client resulting in lower client risk ▪ Stimulates innovation, reducing cost ▪ Price certainty can be obtained before commencement ▪ Quicker to procure as allowing contractor to take on design whilst other things are running ▪ Tends to work well with simpler design elements.	▪ Detailed design, specification or requirements are required ▪ There is reduced competition with fewer companies interested ▪ The contractor takes on greater risk and prices risk into the estimate (increasing scheme costs) ▪ Lack of flexibility to change the specification ▪ In-contract scope change can be expensive ▪ Less control over design – usually based on self-certification of quality by contractor and quality of design is dependent on the robustness of the client requirements. ▪ Additional administration required to ensure that contractors work to our standard details / design guidance. ▪ On tight programmes, the time allowance for development and signoff of client requirements may act as a constraint

5.3.7 A traditional procurement strategy (either lump sum or measurement) may be considered appropriate where a detailed design can be completed before commencing procurement. The use of separate consultants and contractors to provide design and construction services is key to this strategy and takes advantage of increased price certainty, lower levels of change and clear risk allocation.

5.3.8 A design and build procurement strategy is considered appropriate where a full detailed design has not been completed before commencing procurement. It offers several benefits and would enable the client to transfer a significant portion of design and delivery risk to a third party while promoting innovation and cost-effectiveness through either a single-stage or two-stage competitive procurement exercise.

5.3.9 The delivery of the scheme under a design and build procurement route where the main contractor is appointed to design and construct the works is considered the most feasible option at this stage of OBC development.

5.4 Route to Market

5.4.1 There are a number of different routes to market that may be suitable for the procurement of the proposed scheme. These options include:

- A procurement exercise using existing frameworks to access pre-qualified contracts and deliver the scheme
- A new procurement exercise using an open procedure, restricted procedure, competitive dialogue, or competitive procedure with negotiation

5.4.2 Given the relatively limited nature of the scheme and restricted MRN funding window (2020-2025), the option of creating a new framework to deliver the outputs of the WWHAR scheme is not seen as appropriate.

Existing Frameworks

5.4.3 Frameworks (or use of embedded contractor) offer a faster way of procuring support. Given the constraints of the MRN programme, this may be seen as a sensible way to procure support while ensuring that a legally compliant process has been followed to shortlist available contractors.

5.4.4 The trade-off for this accessibility, however, is the reduced competition in any new procurement process. Ongoing frameworks are also at risk of elapsing during the duration of the project, which could result in a further procurement for any new works.

5.4.5 NCC has access to a number of existing, procured, legally compliant frameworks for highways works as follows:

- Eastern Highways Alliance
- Midlands Highways Alliance Plus

Eastern Highways Alliance

5.4.6 The Eastern Highways Alliance (EHA), Eastern Highways Framework 3 (EHF3), awarded in October 2020, covers 10 councils, of which NCC is one, and includes schemes worth up to £30m such as roundabouts, cycle paths, new roads, and other infrastructure. Nine successful contractors have been awarded places on the framework. The most appropriate for the WWHAR scheme are:

- Interserve Construction
- BAM Nuttall
- John Sisk

5.4.7 The EHF3 will provide benefits to the way local authorities in the region deliver highway works, reducing the time and cost of projects whilst providing an efficient way to procure investment in highways.

5.4.8 The EHA has adopted the NEC4 suite for EHF3. Depending on the delivery methodology, a wide range of option clauses are available for use.

5.4.9 The EHA Framework Contract provides NCC with a significant level of flexibility in terms of its delivery options, as well as a swift route to market that negates the need for an FTS process, should the Authority choose. EHF3 mirrors the delivery options of EHF2 in terms of routes to market, Competed Services (formerly Mini Competition) and Standard Services (formerly Direct Award). There are 3 financial Lots available within this new Framework, Lot 1 which covers works up to £2.0m, Lot 2 for works between £1.5m and £7.0m with Lot 3 covering £5.0m to £30.0m (and greater with EHA Board approval).

Midlands Highways Alliance Plus

5.4.10 Midlands Highways Alliance Plus (MHA+) was formed in 2020 after the merger of three regional efficiencies groups. These are:

- Midlands Highway Alliance
- Midlands Service Improvement Group
- West Midlands Highway Alliance

5.4.11 MHA+ is designed to deliver highways schemes for the 35 local highway authority members across the Midlands and beyond. In early 2023, MHA+ invited civil engineering professional service providers to bid for framework focusing on highway, civil and municipal engineering works, with a value of up to £960m.

5.4.12 There are a range of work streams and service improvement group working collaboratively across MHA+. The largest contributor is the medium schemes frameworks, with an estimated value of £1bn following the merger of the three efficiencies groups. Eight firms were originally shortlisted to bid for the framework, with Balfour Beatty, Eurovia, Galliford Try and John Sisk the four successful contractors. Using these, the 35 local authority members have avoided the cost of individual procurement, saving around £100k per scheme.

Competitive Tender Options

5.4.13 All works contracts valued above £5,336,937 need to be procured in line with the Public Contract Regulations 2015. All procurements are advertised by publishing a Contract Notice via the Find a Tender Service.

5.4.14 Four options within the Public Contract Regulations 2015 have been considered:

- Open Tender
- Restricted Tender
- Competitive Dialogue
- Competitive with Negotiation

Open Procedure

5.4.15 This procedure allows an unlimited number of interested parties to tender against defined parameters. Although bidders would be expected to pass a number of set minimum standards, there are no restrictions on the number of parties who are permitted to tender, meaning that some who bid may not be suitable to carry out the work.

5.4.16 Although the Open procedure is straight forward, this route to market is not usually recommended for complex construction projects where it may not be possible to define the full requirement from the outset. Restricted Procedure

Restricted Procedure

5.4.17 This is a two-stage procedure. The first stage allows the contracting authority to set the minimum criteria relating to technical, economic and financial capabilities that the potential bidders must satisfy. Although the number of bids at the first stage may be high, the restricted procedure allows for only a small number of bidders to submit a tender against the requirements.

5.4.18 Following evaluation of the responses to the first stage a minimum of five bidders (unless fewer qualify) are invited to tender in the second stage. Although the restricted procedure is straight forward, as with the open

procedure it is not usually recommended for complex construction projects where it may not be possible to define the full requirement from the outset.

Competitive Dialogue

5.4.19 This procedure is appropriate for complex contracts where contracting authorities:

- Are not objectively able to define the technical means capable of satisfying their needs or objectives; and/or
- Are not objectively able to specify the legal and/or financial make-up of a project

5.4.20 This is a multi-stage procedure. The first stage is a pre-qualification to select the potential bidders to participate in the dialogue. In the second stage, the contracting authority enters into a dialogue with the potential bidders to identify and define the means best suited to satisfy their needs. Any aspect of the contract may be discussed, including technical requirements for the works to be delivered and the commercial / contractual arrangements to be used. The dialogue may be conducted in successive phases with the remaining bidders being invited to tender. By the end of the dialogue phase the contracting authority's requirements will have been determined such that the scheme can be tendered. In the final stage, the remaining bidders from the dialogue phase are invited to tender for the scheme.

5.4.21 Requests to participate must be received within 30 days from the date of the Contractor Notice. A minimum of three suppliers must be invited to participate.

Competitive Procedure with Negotiation

5.4.22 The procedure is intended to be used where minimum requirements are able to be specified but negotiations with bidders may be needed to improve the initial tenders. The grounds for using this procedure are as follows:

- Where needs cannot be met without adaptation of readily available solutions

- Where the contract includes design or innovative solutions
- Where the requirement is complex in nature, in its legal and financial make-up or because of its risks
- Where the technical specifications cannot be established with sufficient precision
- In the case of unacceptable/irregular tenders

5.4.23 Within this procedure, bidders initially submit tenders based on the information issued by the contracting authority. The contracting authority is then able to review the tenders it has received and negotiate with the bidders, following which the tenders will be resubmitted. This procedure may therefore be useful where the requirements are well developed initially, and full tender documents can be produced but it is felt that there may be advantage in retaining the ability to negotiate if there are certain aspects which bidders raise.

5.4.24 Requests to participate must be received within 30 days from the date of the Contractor Notice. In a state of urgency, this time limit can be reduced to 15 days.

Competitive Procedure with Negotiation

5.4.25 The procedure is intended to be used where minimum requirements are able to be specified but negotiations with bidders may be needed to improve the initial tenders. The grounds for using this procedure are as follows:

- Where needs cannot be met without adaptation of readily available solutions
- Where the contract includes design or innovative solutions
- Where the requirement is complex in nature, in its legal and financial make-up or because of its risks
- Where the technical specifications cannot be established with sufficient precision

- In the case of unacceptable/irregular tenders

5.4.26 Within this procedure, bidders initially submit tenders based on the information issued by the contracting authority. The contracting authority is then able to review the tenders it has received and negotiate with the bidders, following which the tenders will be resubmitted. This procedure may therefore be useful where the requirements are well developed initially, and full tender documents can be produced but it is felt that there may be advantage in retaining the ability to negotiate if there are certain aspects which bidders raise.

5.4.27 Requests to participate must be received within 30 days from the date of the Contractor Notice. In a state of urgency, this time limit can be reduced to 15 days.

5.5 Contract Strategy

5.5.1 There are a number of preferred procurement options available to NCC for the WWHAR scheme, in addition to having access to WSP as a long-term design partner.

5.5.2 One of the preferred forms of contract, NEC4 Engineering and Construction Contract suite, offers five Conditions of Contract options for scheme delivery including priced, target cost and cost reimbursable contracts. The contract strategy considers which contractual mechanisms align best with the procurement objectives. NCC have experience in using all of the available NEC4 contract options and tender processes.

5.5.3 The five main options within the NEC4 suite are set out below and expanded upon from Section 5.53.

- Option A: Priced contract with activity schedule
- Option B: Priced contract with bill of quantities
- Option C: Target cost with activity schedule
- Option D: Target cost with bill of quantities

- Option E: Cost reimbursable

Contract Strategy Options

5.5.4 NEC4 Option A is a priced contract with an activity schedule where the risk of carrying out the work at the agreed price is largely borne by the contractor. contractors tender for an Option A contract based on lump sum prices for each activity based on his own assessment of the requirements of the activities.

5.5.5 NEC4 Option B is a priced contract with a bill of quantities where the risk of carrying out the work at the agreed prices is largely borne by the contractor. contractors tender for an Option B contract by completing a bill of quantities prepared by the Employer (Norfolk County Council). The quantities required to complete the scheme works are therefore specified by NCC, and therefore quantities risk rests with NCC.

5.5.6 NEC4 Option C is a target cost contract with an activity schedule where the out-turn financial risks are shared between the Employer and the contractor in an agreed proportion. contractors tender a target price based on a list of activities which is then adjusted through the delivery to reflect agreed changes. The contractor is then paid for completed works and a percentage of any savings made during the delivery. The contractor also takes a share of the risk of costs exceeding the target price.

5.5.7 NEC4 Option D is a target cost contract with a bill of quantities where the out-turn financial risks are shared between the Employer and the contractor in an agreed proportion. contractor's tender and are paid in a similar mechanism to Option C but payment is based on a bill of quantities rather that an activity schedule.

5.5.8 NEC4 Option E is a cost reimbursable type contract where the financial risk is taken largely by the Employer (NCC). Under Option E the contractor is paid for works completed plus an additional fee.

Contract Strategy Discussion

5.5.9 The Options, A to E, offer varying levels of risk exposure, incentivisation and flexibility depending on the procurement objectives and the level of design undertaken prior to tender. These are summarised in Table 5.4.

5.5.10 A high degree of design maturity will be achieved prior to procurement of works. This makes the fixed-price contracts offered by Options A and B both feasible contract strategies. Option A and, to a lesser extent, Option B minimises NCC's risk exposure following contract award and incentivises the contractor to deliver the scheme in the most efficient manner. This can result in increased cost and programme certainty.

5.5.11 Options C or D follow a target cost contract strategy, which provide a more balanced allocation of risk between the NCC and contractor as well as incentivising both parties to work together to achieve an efficient delivery. In practice, target cost contracts are usually tendered with activity schedules (Option C), rather than with a bill of quantity (Options D).

5.5.12 Lessons have been learnt by NCC through the delivery of the Norwich Northern Distributor Road (NDR) in respect of the NCC owning the design and consequently all of that risk. If there is any change to the design during the construction stage, the NCC will be responsible for additional contractor costs which they would not be in a Design and Build (D&B) style contract. It is to be decided whether the final preferred option will be a D&B contract.

5.5.13 However, it is likely that this scheme will have a significant level of design maturity by the time Planning Permission has been granted, so the risk of change should be reduced. Also, the scale of the project and risks associated to delivery are significantly different to that of the NDR, so NCC are more comfortable with the Option C contract using a Traditional delivery methodology.

5.5.14 The cost reimbursable strategy offered by Option E places maximum risk with NCC and little incentive for the contractor to deliver works efficiently. A cost reimbursable contract would not generally be considered an appropriate

delivery strategy for the main contract works of a large civil engineering infrastructure scheme.

Table 5.4 – NEC4 option comparison

Option	Advantages	Disadvantages
NEC4 Option A	Somewhat greater price predictability at start of Stage Two Simpler to administer Quantity and price risks borne by contractor	contractor incentivised to cut corners at the expense of quality contractor's price likely to include high contingency Adversarial relationship more likely to develop Less commercial transparency around compensation events
NEC4 Option B	Somewhat greater price predictability at start of Stage Two Bill of Quantities could lead to cost savings when the scheme is well defined, and Employer is able to list out the activities and approximate quantities Simpler to administer	Similar negatives to A however greater levels of risk taken on by NCC over Option A Any risks/omissions in the Bill of Quantities will be an Employer risk and treated as compensation events Less commercial transparency around compensation events
NEC4 Option C	More incentive on contractor to innovate to achieve a better outturn cost contractor commercially rewarded for performance contractor encouraged to identify supply chain efficiency to benefit of both contractor and client Collaborative behaviour incentivised Commercial transparency	Particularly tight project controls needed Reduced cost predictability Reliant on audit accuracy Administratively burdensome
NEC4 Option D	Advantages are similar to C	Target cost contracts are not typically tendered with a bill of quantity

Option	Advantages	Disadvantages
NEC4 Option E	Effective where the scope of the work to be carried out cannot be properly defined at the outset, and the risks associated with the works are high, such as emergency work	Places maximum risk with NCC in term of delivery Very little incentive for the contractor to deliver works efficiently Not an appropriate strategy for schemes such as this one

Market Engagement

5.5.15 Whilst no direct market engagement has been undertaken for the WWHAR scheme, such as the holding of an industry engagement day to assess the interest from potential bidders and likely supply chain partners, it has been undertaken as part of the Long Stratton Bypass scheme. This is one of NCC's major schemes, and NCC is currently working in collaboration with South Norfolk District Council, Norfolk Homes Ltd and Norfolk Land Ltd to develop proposals to deliver a long-awaited bypass of Long Stratton on the eastern side of the town, which will cut congestion and support the local economy. An anticipated output of this engagement with suppliers is advice and information that will support the procurement process and encourage construction industry interest. NCC will be able to use this market engagement on the Long Stratton Bypass scheme to inform future engagement on the WWHAR scheme.

Preferred Contract Strategy

5.5.16 There are a number of preferred procurement options available to NCC to deliver the WWHAR scheme, and rationale will be provided to the DfT for the selection of a final preferred sourcing option.

5.5.17 Option C, a target cost with activity schedule could be selected as the preferred procurement solution to deliver the scheme, given that it balances the allocation of risk between NCC and the contractor, incentivising both parties to work together to achieve an efficient delivery.

5.5.18 NCC will be looking to create a position of shared savings from improved delivery so that both parties' benefit. NCC will be able to set programme

parameters for the contractor to work within which important in terms of the MRN funding. While the risk element sits in the general mid-range for NEC Options, this should be reduced as the design will be well progressed, based upon a tight scope with good quality works information to support the Contract.

5.6 Payment Mechanisms

5.6.1 It is anticipated that payment will be made to the contractor by monthly valuation with a BACS payment within 30 days after the due date for payment.

5.7 Pricing Framework and Charging Mechanisms

5.7.1 The council intends to make payments in relation to the proposed products and services as shown below in Table 5.5.

Table 5.5 – Payment mechanisms

Service Provider	Element	Payment Mechanism
Professional services	Design	BACS
Professional services	Support to Planning process	BACS
Construction services	Construction	BACS

5.8 Risk Allocation and Transfer

5.8.1 The general principle of risk allocation is that risks should be passed to the party best able to manage them, subject to value for money considerations.

5.8.2 Risks for the scheme have been identified by specialists in highways and structural engineering, geotechnics, transport planning, quantity surveying and the environmental disciplines and entered into a risk register. By being risk aware, reviewing its risk appetite and tolerance, NCC will be better placed to both take advantage of opportunities and manage threats.

5.8.3 The Contractor will also be required to produce a priced risk register. This will be reviewed as part of the process of target cost setting and decisions made

on the mechanism for sharing risk between the Contractor and NCC, ensuring that the proposed allocation provides the best value for money for the project.

5.8.4 At this stage of design prior to the appointment of a Contractor, the scheme cost estimate contains a greater proportion of risk borne by NCC than will remain after the Contractor appointment. Some of the risk will be captured and quantified within the risk register and QRA process. Risk allocation will not be completed until the Contractor is awarded the construction contract.

5.8.5 The detailed description of this process is outlined in the Management Case. Once the tendering process is complete, and through use of NEC4 Option C some of the risk (such as scheme cost increases associated with the design and construction) can be transferred to the Contractor. Other risks, such as the identification of statutory undertaker equipment, and mitigation costs associated with these, can be removed from the "risk pot" completely if they do not materialise, or transferred to "actual" scheme costs if they do materialise, rather than remaining as risk.

5.8.6 An assessment of how the associated risks might be apportioned between the Council and the Contractor is shown in Table 5.6.

Table 5.6 – Potential risk allocation

Risk Category	Potential allocation: Council	Potential allocation: Contractor
Design risk	The Council will have design responsibility	Not applicable
Construction & development risk	The starting point will be the standard risk allocation in the NEC4 ECC contract. This will be tailored to reflect the specifics of the scheme.	Risk shared between Council and Contractor
Transition and implementation risk	Risks associated with design vehicle traffic flow will be borne by the Client	Successful commissioning will be a Contractor risk
Operating risk	The Council will take the operating risk	Not applicable

Risk Category	Potential allocation: Council	Potential allocation: Contractor
Termination risks	The standard ECC termination position applies, with additional grounds for termination if the Contractor: • is convicted or has been convicted of a criminal offence relating to the conduct of its business or profession; or • commits or is found to have committed an act of grave misconduct in the course of its business or profession; or • fails or has failed to comply with any obligations relating to the payment of any taxes or social security contributions; or has made any serious misrepresentations in the tendering process for any project or matter in which the public sector has or had a significant participation; or • fails to obtain any necessary licences or to obtain or maintain membership of any relevant body; or • demerges into two or more firms, merges with another firm, incorporates or otherwise changes its legal form or there is a change of control as defined by section 416 of the Income and Corporation Taxes Act and, in any such change of control, there are reasonable grounds relating to the financial standing of the new entity that is proposed to Provide the Works for the Client to withhold its consent.	Risk shared between Council and Contractor
Technology & obsolescence risks	The council takes the obsolescence risk during the highway's operational life	Not applicable

Risk Category	Potential allocation: Council	Potential allocation: Contractor
Residual value risks	Residual value risk is retained by the Council	Not applicable
Financing risks	Financing risk is retained by the public sector	Not applicable
Legislative risks	The council would take risk associated with changes in legislation	Not applicable

5.9 Contract Length

5.9.1 The tender invitation will assume a construction period of 2 years. It is however possible that tender submissions will propose a shorter period than this, as the programme contains elements of contingency following the risk assessment.

5.9.2 Construction is expected to commence in spring 2024 and is expected to be complete by mid-2027.

5.9.3 The full programme is considered in further detail within the Management Dimension.

5.10 Human Resource Issues

5.10.1 At this stage, no significant human resources issues have been identified that could identify the deliverability of the WWHAR scheme. NCC does not expect any Transfer of Undertakings Protection of Employment (TUPE) issues given the nature of the services that need to be procured.

5.10.2 More information on the governance and management of the project is set out in the Management Dimension.

5.11 Contract Management

5.11.1 The form of contract selected (Option C) provides NCC with a suitable contract at construction to minimise risk, but with increased ability to bring forward the detailed design process in the programme.

5.11.2 Design, procurement, and construction supervision will be managed by NCC and if necessary, supported by NCC's Consultants WSP. Both the council and the consultant have experience in delivering major schemes including Norwich Road Distributor (NDR), A47/A1042 Postwick Hub Junction Improvement and A12/A143 Link Road.

5.11.3 The Project Manager will be named within Contract Data as the individual who will administer the contract on behalf of the Employer. The Project Manager will have designated authority to issue all instructions, notifications and other communications required under the contract. As well as providing general management support and advice to the Project Manager, NCC will undertake the role of Supervisor under the contract with responsibility to check for compliance to the Works Information. Under the contract the responsibilities of the Project Manager or the Supervisor may be delegated but this is not anticipated at this stage.

5.11.4 Further detail on contract management will be provided at the FBC stage.

5.12 Summary

5.12.1 The Commercial Dimension acknowledges that a design and build procurement route is the most viable option as it offers lower risk for NCC. However, it is also proposed that this will be reviewed throughout the project to ensure the contract terms and details align with the project requirements.

5.12.2 It is recognised that the constrained timescales of the preferred MRN funding route will result in options being prioritised that streamline procurement, whilst ensuring that the output-based specification and procurement criteria can be achieved.

5.12.3 It is therefore expected that the WWHAR scheme will be procured using an existing framework, along with an NEC form of contract. This approach also makes best use of the experience that NCC has gathered on previous infrastructure projects.

5.12.4 As the scheme proceeds to FBC stage, further consideration will be given to the risk profile for the scheme, as well as current market conditions that may drive the procurement process.

6 Management Dimension

6.1 Introduction

6.1.1 The Management Dimension considers whether the scheme is considered deliverable in terms of governance. It sets out the processes and controls in place to manage the implementation of the WWHAR scheme, and track and realise future benefits.

6.1.2 It demonstrates the way in which the scheme will be delivered in accordance with best practice governance and assurance, project planning, risk management, communications and stakeholder management, benefits realisation, lessons management and closeout practices.

6.1.3 The dimension is structured in line with *'Transport Business Case: assessment and process procedures'* guidance from the DfT and sets out:

- Evidence of similar, large-scale projects that have been successfully delivered by NCC
- Project dependencies
- Governance arrangements that have been put in place to oversee delivery
- The programme plan for delivery
- The assurance regime for the project
- The stakeholder management process
- The strategy for identifying and managing programme risks
- How lessons learned will be fed back through the project

- How the intended benefits of the scheme will be realised
- How carbon management will be integrated into the scheme
- How critical systems and data will be maintained safely and securely
- How the performance of the scheme will be monitored

6.2 Evidence of Similar Projects

6.2.1 NCC have a long history of successfully delivering schemes both large and small in scale, to time and budget, including:

- Cringleford Cluster (including new development link road)
- King's Lynn South Lynn Transport Major
- King's Lynn Major Developments (including new development link road)
- King's Lynn Transport Interchange
- A47/A1042 Postwick Hub Junction Improvement
- A12/A143 Link Road
- Norwich Northern Distributor Road (NNDR)
- A140 Long Stratton: Hempnall Junction Improvement
- King's Lynn Nar Ouse Enterprise Zone
- Great Yarmouth Third River Crossing
- Great Yarmouth Operations and Maintenance Campus

6.2.2 Table 6.1 provides evidence of NCC's ability to successfully deliver high-quality, large-scale highways schemes. Each of the schemes listed below demonstrates the need for a robust outline design, grounded in the strategic aims for the region, and underscored by realistic objectives. Wherever possible, lessons learnt will be applied to the delivery of the scheme.

6.2.3 All of the schemes have been developed and tendered by the County Council or procured using the Council's Highways Term Service Contract. The Council has fulfilled the role of Project Manager.

Table 6.1 – Experience of similar projects

Scheme Name	Description	Contract	Form of Contract	Approximate total project value	Construction date
A47/A1042 Postwick Hub Junction Improvement	Construction of a new bridge over the A47 and the construction of associated link roads, slip roads, roundabouts junctions, a signal-controlled junction and new access arrangements to the existing Park and Ride site	NEC3 Engineering and Construction Contract	Option C, with a Target Price developed from first principles and an incentivised approach which aimed to deliver the construction works below the target figure	£28m	Construction commenced in May 2014 and opened to traffic in December 2015
A47/A143 Link Road	Construction of a new link between the A47 (formerly A12) trunk road and the A143	NCC Term Service Contract - NEC3 Engineering and Construction Contract	Option C, with a Target Price developed from first principles and an incentivised approach which aimed to deliver the construction works below the target figure	£8m	Construction commenced in September 2014 and opened to traffic in December 2015

Scheme Name	Description	Contract	Form of Contract	Approximate total project value	Construction date
Norwich Northern Distributor Road	Construction of 20km dual carriageway including eight bridges (one over a railway), a grade separated junction, and associated link roads and roundabout junctions	NEC3 Engineering and Construction Contract	Option C, with a Target Price developed from first principles and an incentivised approach which aimed to deliver the construction works below the target figure	£177m	Construction commenced January 2016 and fully opened to traffic April 2018
A140 Long Stratton: Hempnall Junction Improvement	Construction of roundabout to south-west of existing junction of A140, B1527 and C497 (junction locally known as 'Hempnall Crossroads'), to replace the existing crossroads junction. Proposed street lighting, landscaping, surface water drainage and associated works	NEC3 Engineering and Construction Contract	Option C, target price from first principles	£4.06m	May 2019 – October 2019

Scheme Name	Description	Contract	Form of Contract	Approximate total project value	Construction date
Kings Lynn – Nar Ouse Enterprise Zone	Construction of a new Enterprise Zone between Nar Ouse Way and Horsley Fields in Kings Lynn, including new access roads, shared use footway / cycleways, street lighting, surface and foul water drainage.	NEC4 Engineering and Construction Contract	Option C, target price with activity schedule	£8m	October 2022 – April 2024

Consultant Experience

6.2.4 NCC is being advised by WSP Ltd, the Council's term contract consultant, and a major provider of highway consultancy services to local authorities. This contract started in 2014 and has potential to extend to 2026.

6.2.5 WSP has experience and expertise in Business Case proposals, optioneering for cost benefit analysis, planning applications and detailed design for major infrastructure projects for central and local government clients. Recent projects include the Great Yarmouth Third River Crossing (for NCC), Lake Lothing (Lowestoft) Third Crossing (Suffolk County Council), the Shrewsbury North West Relief Road (Shropshire Council) and the M4 Smart Motorway for Highways England. WSP is also one of the UK's leading providers of support services to the statutory procedures required to plan, deliver and maintain infrastructure projects, providing land referencing, stakeholder engagement and consultation service, and order management.

Contractor Experience

6.2.6 It will be essential to appoint a contractor with significant experience in delivering similar large-scale highway projects. The selection and procurement of the contractor is summarised in the Commercial Dimension, and the management of the contractor is considered in the project governance section below.

6.3 Project Dependencies

6.3.1 The WWHAR scheme is not dependent on any prior schemes or projects and can be delivered independently. However, the West Winch Strategic Growth Area is reliant on a new road linking the A10 and A47 to provide a degree of relief of traffic on the existing A10 around West Winch, and access to the new development. The access road would need to be completed in advance of any significant housing development taking place. NCC are working closely with the developer team, who are leading the process to finalise their updated planning application for their development and the access road scheme.

6.4 Governance, Organisational Structure & Roles

6.4.1 The governance structure for delivery of the WWHAR scheme follows an established structure that has been used by NCC for the successful delivery of previous schemes.

6.4.2 To ensure successful delivery of this scheme, NCC has established and will continue to resource the following bodies:

- Project Board
- Project Delivery Team
- Stakeholder Group

6.4.3 At the heart of project governance is the Project Board, which is accountable through the Project Sponsor to NCC, and is responsible for reviewing the scheme and taking key decisions. The Senior Responsible Officer is accountable to the Project Board and is responsible for the work of the Delivery Team.

Project Sponsor

6.4.4 The Project Sponsor is NCC, represented by Grahame Bygrave, the Council's Interim Executive Director of Community & Environmental Services.

Senior Responsible Officer

6.4.5 The Senior Responsible Officer will be David Allfrey who is currently the Interim Director of Highways, Transport and Waste at NCC.

6.4.6 David Allfrey is a Chartered Civil Engineer and a Member of the Institution of Civil Engineers (ICE). He has 28 years' experience working in the construction industry. For the last 25 years he has worked for NCC specialising in highways design and maintenance, and supervising and delivering a wide range of highway maintenance and major improvement schemes, including:

- The Nar Ouse Regeneration Route in King's Lynn.

- A47/A1042 Postwick Hub Junction
- Norwich Northern Distributor Road

Project Board

6.4.7 NCC has established a Project Board for the scheme. In line with best practice the board includes representatives of the customer, user, and supplier aspects of the project. The main roles of the board are decision taking and review. The Board will be responsible for:

- Approval of project / scheme objectives and scope
- Authorisation of expenditure on the project in line with the Project Plan
- Briefing senior officials and other executives on the status of the project
- Communication of information about the project to other parts of NCC and key stakeholder groups
- Project assurance
- Signing off any changes to the Project Plan and Programme, Business Case or project budget
- Monitoring quality control
- Managing key risks highlighted in the Risk Register
- Signing off key stages of the project and approval to proceed to the next phase
- Monitoring the project as it develops to ensure that it meets the scheme objectives

6.4.8 The Project Board will meet monthly until the project has been completed, after which it will make arrangements for ongoing oversight and reporting of monitoring and evaluation.

6.4.9 The key project team members including their roles and responsibilities are provided in Table 6.2. The project team has experience in the successful

delivery of similar projects including through the EHA Framework with Grahame Bygrave (Director for Highways and Waste), on the EHA Board.

Table 6.2 – Project board roles and responsibilities

Role	Responsibilities	Name	Position
Project Sponsor/Project Director	Chair of Project Board	Grahame Bygrave David Allfrey	Council's Interim Executive Director of Community & Environmental Services Interim Director Highways, Transport & Waste
Senior Responsible Owner (SRO)	Responsible for the successful delivery of the project, ensuring that it meets its objectives and delivers its intended benefits	David Allfrey	Interim Director Highways, Transport & Waste
Project Finance	Review budget and costs to ensure funding is available	Harvey Bullen	Director of Strategic Finance
Project Stakeholder and Engagement Manager	Responsible for communication planning and management	Josh Wicks	Stakeholder and Engagement Manager
Project Manager – WWHAR	Managing the project to ensure that it delivers the required products within the agreed constraints. Co-ordinating the work of the delivery team	Jon Barnard	Project Manager
Head of Procurement	Responsible for the procurement delivery	Al Collier	Director of Procurement and Sustainability
Contract Manager	Responsible for developing and managing construction contract	Brett Rivett	Consultant Commercial Manager

Role	Responsibilities	Name	Position
Project Manager - WSP	Managing the project to ensure that WSP delivers the required product within the agreed constraints	Nick Clarke	Associate Director
Borough Council of King's Lynn and West Norfolk Representative	Strategic Planning	Nikki Patton	Housing Strategy Manager

Delivery Team

6.4.10 NCC currently has a Working Group developing the WWHAR scheme in conjunction with BCKLWN and Highways England and has established a Delivery Team for the scheme. The team is led by the Project Owner and includes representatives of the various disciplines and work streams involved in delivering the project to completion. The Delivery Team meet monthly, or as required, and the Project Manager is responsible for determining which disciplines or workstreams need to be represented at any particular meeting. The Delivery Team approach runs from 'cradle to grave' right through the design and construction stages. Each workstream has an individual, detailed, agreed action plan to meet the target milestones for the coming year and beyond. This ensures co-ordination of activities and is a forum for discussing issues/problems as they arise.

6.4.11 The main responsibilities of the delivery team are to:

- Co-ordinate the different activities which make up the project
- Provide direction to the technical delivery of the project
- Undertake monthly review of progress against targets and programme
- Undertake monthly review of the risk register, and initiate corrective active where appropriate
- Provide, as a minimum quarterly, progress reports for the Project Board. The Board will consider any matters of a strategic nature and give advice accordingly

6.4.12 Costs are monitored and presented to the Project Delivery Team on a monthly basis. The Project Manager will maintain the system and take account of any known committed costs in updating forecast outturn.

6.4.13 The Senior Responsible Officer reviews the actual and forecast expenditure against profile and budget, and reports to the Project Board.

Table 6.3 – Project delivery team

Role	Responsibility	Name
Senior Responsible Officer/ Project Owner (NCC)	▪ Chair of Delivery Team Provides reports to Project Board	David Allfrey
Stakeholder & Communications Lead (NCC)	▪ Develop communications plan ▪ Option Consultation ▪ Stakeholder Management ▪ Press Liaison	Josh Wicks
Finance Team (NCC)	▪ Financial monitoring and reporting	Tom Galer
Highways and Transport Team (NCC)	▪ Supporting project delivery	Liz Poole
Project Manager (NCC)	▪ NCC Project Lead	Jon Barnard
Project Manager (WSP)	▪ Develop Full Business Case ▪ Coordinate design and delivery ▪ Monitoring and evaluation	Nick Clarke
Assistant Project Manager (NCC)	▪ Support the Project Manager to deliver the project	Emily Harvey
Land Lead	▪ Leading negotiation and acquisition of land	Grant Brewer

Role	Responsibility	Name
Specialist Teams (WSP)	▪ Design ▪ Construction Design (CDM) ▪ Highways ▪ Environment ▪ Transport Modelling ▪ Business Case ▪ Planning ▪ Infrastructure ▪ Geotechnical	Stuart Payne Jon Horrill Lynden Cable Steffan Shageer Michael Johns Chris Whitehouse Guy Maxfield Anthony Groom Alex Dent
Project Coordinator (NCC)	▪ Project coordination	Carola Wayne

6.5 Project Plan/Programme

6.5.1 A programme has been developed, setting out key project tasks and their duration, the interdependencies between each of the tasks, and key milestones and gateways.

6.5.2 The programme is a live document, with progress against planned task completion monitored against actual progress on a weekly basis by the WWHAR and WSP Project Managers. The WWHAR Project Manager reports progress against plan to the Project Board.

6.5.3 Construction is programmed to commence in spring 2024 and be completed in 2027. A detailed project programme is located in Appendix Q (refer to separate document). The key milestones are included in Table 6.4.

Table 6.4 – Key delivery milestone

Milestone	Current Estimate
Outline Business Case submission	September 2023
Full Business Case submission	September 2024
Planning application submission	November 2023
Tender process	January 2024
National Grid gas main works	Dec 2024 – Nov 2025
Detailed design completion	December 2024

Milestone	Current Estimate
Land acquisition completed	April 2025
Start of construction work	Apr 2025 – May 2027
Scheme opening	May 2027

6.6 Assurance and Approval Plan

Approvals

6.6.1 The WWHAR scheme will follow applicable assurance and approval processes at both a national and local level. As the scheme has a value of over £20 million, the Business Case has been developed in line with the required TAG processes. Furthermore, the Business Case will need to be signed off to the satisfaction of the NCC Section 151 Officer in their role as Chief Financial Officer.

6.6.2 The Business Case will be approved by NCC Cabinet at a local level and follow the relevant Major Road Network (MRN) funding approval process. The scheme is fully supported by James Wild, Member of Parliament for North West Norfolk, and he has provided a letter of support.

6.6.3 The DfT will assess the technical content of the Business Case in order to confirm that the scheme meets the relevant criteria across all five cases. After confirming that the scheme meets the criteria, the DfT will then advise Transport Ministers to approve (or decline) the Business Case.

6.6.4 The local funding contribution is discussed within the Financial Dimension. However, to confirm, NCC Section 151 Officer has underwritten the local contribution and will approve the release of local funding, when satisfied and appropriate to do so.

Assurance – Gateway Reviews

6.6.5 It is essential that large, complex and long running projects are monitored effectively. All major transport schemes must demonstrate that a system for monitoring progress is part of the management structure and plan. The

Gateway Review process is a formal assessment of the progress of a project at key stages in its development.

6.6.6 A Gateway Review is a 'peer review' in which independent project managers from outside the project use their experience and expertise to examine the progress and likelihood of successful delivery of the project. In the case of the WWHAR scheme, these peer reviews will be undertaken by Local Partnerships.

6.6.7 A Gateway Review provides assurance and assurance to the SRO that:

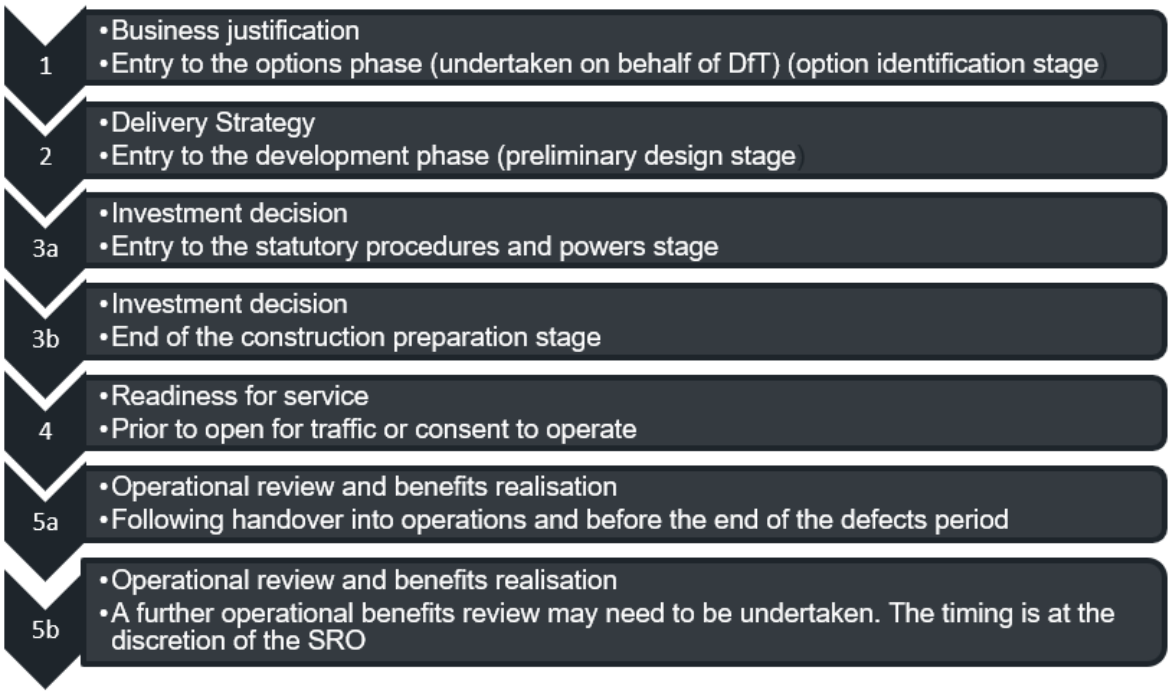
- Suitable skills and experience are deployed on the project
- All stakeholders understand the project status and issues
- There is assurance that the project can progress to the next phase
- Time and cost targets have a realistic basis
- Lessons are learned
- The project team are gaining input from appropriate stakeholders

6.6.8 Gateway Reviews are a mandated assurance process for all publicly funded major projects, although not all reviews will apply to all projects. The SRO and WWHAR Project Manager will engage early with relevant parties to agree which gateways are required and when. Throughout the process, guidance and advice will be sought from relevant centres of expertise (e.g., finance, procurement, economists).

6.6.9 The Gateway Reviews will assess the project's viability, the value for money to be achieved, and the proposed approach for achieving delivery of the project's objectives. This approach will allow the review to assure the Project Board that the selected delivery approach is appropriate.

6.6.10 Figure 6.1 lists the normal stages for Gateway Reviews, as part of the process of managing stage boundaries.

Figure 6.1 – Gateway review stages



6.6.11 There has been an on-going internal review of the WWHAR project to ensure that it aligns with the project delivery protocols and procedures of the County Council. Since November 2022, Local Partnerships have been appraised of the project and will be carrying out a Gateway Review in October 2023 after the submission of the OBC.

6.7 Communications and Stakeholder Management

6.7.1 This section sets out the strategy for developing communications and stakeholder management on the project. The principles, purpose, stakeholders and communications activities are largely shared between the West Winch Strategic Growth Area (WWSGA) and the housing access road. As such, a joint communications and engagement strategy and delivery plan has been developed to ensure clear, consistent, and coordinated communications activities. This is provided in Appendix R (refer to separate document).

6.7.2 The key principles for communication and engagement during the development of the design of the project are:

- To be proactive by keeping stakeholders informed and engaged
- To be positive in key messaging
- To ensure clear and concise communications that are accessible and easy to understand
- To provide consistent updates and a timely flow of information
- To create opportunities for stakeholders to express their opinions and encourage the opportunity to share their views on the options freely and openly
- To build upon the feedback received during the public consultation period
- To collaborate with and empower participants to share updates and information through their own channels

6.7.3 The WWHAR scheme is now proceeding with development of the proposed alignments and initial design work. This involves environmental surveys, key structure design, more detailed costing, and land negotiation. Public consultation at this point has involved three local consultation events, two in West Winch and one in North Runcton, with over 150 local residents. Feedback from the consultation events indicated a preference for active travel routes, as well as enhancements to the local landscape and environment. There was support for many of the key elements of the scheme, including the proposals for Rectory Lane and Chequers Lane. Accordingly, this information was then fed into the designs for initial proposals for the housing access road.

Scheme Communications Plan

6.7.4 In addition to the key project-wide communications messages set out above for the WWSGA, a supplementary engagement and communications plan has been developed and implemented for the WWHAR scheme. This includes specific key messages pertaining to the housing access road, emphasising that the scheme is essential to the delivery of the strategic growth area.

6.7.5 The borough council website is the key communications platform where information regarding the WWHAR scheme is provided. Key project milestones, supplementary documents and plans, as well as next steps are updated regularly to keep the public informed with progress to date.

6.7.6 The communications and engagement activities have been delivered by King's Lynn and West Norfolk Borough Council in partnership with Norfolk County Council. The purpose of the strategy is to ensure that accurate and timely messages about the WWHAR scheme and the strategic growth area are disseminated to a range of identified stakeholder groups, as outlined below.

Table 6.5 – Communications method for WWHAR

Audience	Type of Communication	Frequency	Responsibility
West Winch Strategic Growth Area Local Stakeholder Group	Meetings, Website Update	Quarterly	Communications Team
West Winch Delivery Group	Meetings, Website Update	Quarterly	Communications Team
West Winch residents	Newsletter, Letters and Leaflets, Electronic Subscribers List, Online & In-person Consultative Activities	As Required	Communications Team
Neighbouring residents	Newsletter, Letters and Leaflets	As Required	Communications Team
MP	Briefing Sessions, Briefing Note	Quarterly	Project Manager
Stakeholders	Press Releases	Quarterly / As Required	Communications Team
Media	Media Releases, Briefing Note, Column and Feature Opportunities	As Required	Communications Team

Audience	Type of Communication	Frequency	Responsibility
Potential residents, businesses, and visitors	Marketing Collateral	As Required	Communications Team

6.8 Project Reporting

6.8.1 Project reporting will be a live process, which will be kept up to date over the life cycle of the project. This relates to reporting of progress, risks and issues. This will involve the following regular actions, as well as additional reporting as and when required:

- The Project Manager will report at each Project Board meeting
- The Delivery Team leads will report to the Project Manager monthly in advance of Project Board meeting and hold "bi-weekly calls" to discuss progress and issues.

6.9 Risk Management Strategy

6.9.1 Risk Management is a continual process involving the identification and assessment of risks and the implementation of actions to mitigate the likelihood of them occurring and impact if they did. The Project Board's approach to risk management will be proportionate to the decision being made or the impact of the risk, to enable the Council to manage risks in a consistent manner, at all levels.

6.9.2 Key to effectively mitigating risks is to develop a series of well-defined steps to support better decision-making through an in-depth comprehension of the potential risks inherent in a scheme and their likely impact. Annex 4 of the HM Treasury Green Book emphasises that "effective risk management helps the achievement of wider aims, such as: effective change management; the efficient use of resources; better project management; minimising waste and fraud; and supporting innovation".

6.9.3 It also recommends a four-stage process which is broadly cyclical (plan-do-review) requiring on-going review and update of risks to ensure that effective controls are implemented during scheme development and delivery. The risk management strategy is illustrated in Figure 6.2.

Figure 6.2 – Risk management cycle

Risk Management Process

6.9.4 Risk management is seen as a key process underpinning good scheme governance and achievement of scheme objectives in a cost-effective manner. TAG Unit A1.2 requires all project related risks, which may impact on the scheme costs, to be identified and quantified in a Quantified Risk Assessment (QRA) to produce a risk-adjusted cost estimate.

6.9.5 The outcome of the QRA process is the prediction of an 'expected' risk value which provides confidence levels of the risk outcomes, factoring in the various probabilities of these risks materialising. The confidence levels are reviewed to notice any trends with the P80 confidence level used here to provide the 'expected' risk value. This effectively informs the 'risk adjusted cost estimate'. The risk assessment has been undertaken using the following process:

- Risk identification
- Risk quantification
- Assessing the impacts of risk
- Assessing the likelihood of risk
- Managing risk

Risk Identification

6.9.6 A strategic risk register was initially developed in December 2022 to consider both threats and opportunities associated with the WWHAR scheme, and to provide up-to-date input to the above process. Risks were identified by specialists in highways and structural engineering, geotechnics, transport planning, quantity surveying and the environmental disciplines and entered into the Risk Register. This risk register is a live document, which is a continuous process and new risks are identified by specialists as the scheme progresses. The risk register is updated monthly by the project team and reported to the Project Board for challenge / review. The Risk Register is provided in Appendix S (refer to separate document).

The current highest scoring risks, last updated in August 2023, are summarised below in Table 6.6. These are the top five risks identified as part of the QRA process.

Table 6.6 – Top five scoring strategic risks

Risk No.	Description	Impact	Rating
29	West Winch HAR planning determination may be impacted by the outcome of updates to the Local Plan, which is not due to be finalised for another 12 months.	If the housing numbers differ from assumed numbers, then the benefits assumed in our business case around land value uplift may not be realised which may affect the scheme BCR.	High
45	Failure of the Local Plan to be approved by the Secretary of State.	This project is dependent on outcomes built into the Local Plan to support population growth and traffic modelling assumptions that in turn feed into the BCR. Therefore, the BCR is at risk.	High
57	Scope creep - signalisation of Hardwick Interchange. Proposals may be rejected, causing delay.	If we cannot reach a mutually acceptable solution then NH may object to the planning application. This may result in further design changes, consultation and programme prolongation with associated cost impact. This may include more lanes on roundabout approach and on the roundabout.	High
31	Gas main diversion may not be delivered in line with the programme.	This will result in increased construction cost and programme prolongation.	High

Risk No.	Description	Impact	Rating
18	Development Consent Order may be triggered in the area of the proposed works on the strategic road network (A47).	DCO process is a lot more onerous and time consuming than Town and Country Planning. There will be additional design and planning costs, DCO planning consent takes circa 18 months. There would be challenges around the timescales of the ecology reports. If the change is confirmed by the end of August the impact will be more manageable. If we can't open the road by Summer 2027 this would be a showstopper.	Medium

Quantification of Risks

Assessing the impact of risk (costs)

6.9.7 Each risk has been evaluated in terms of the cost outcomes of the risk. Whilst DfT recommends (source: TAG Unit A1.2, Scheme Costs, p.8, paragraph 3.2.10) the use of empirical evidence to estimate a range of cost outcomes, it is noted that 'common sense approximations' should be used when such empirical data is not available, rather than aiming for unrealistic levels of accuracy. At this stage, the cost range associated with the consequences of each risk was estimated, where the 80th percentile is the most likely value (the P80). The estimates have been derived following input from each discipline specialist working alongside the Quantity Surveyor and risk management team, to ensure estimates of cost (and probability, discussed within the next section) are complete and accurate, and consistent with the basis of the base cost estimate.

Estimating the likelihood of the outcomes occurring

6.9.8 Having estimated the likely impact (in cost terms), the likelihood (probability) of the risk occurring also needs to be estimated. Assigning probabilities is not an exact science (source: TAG Unit A1.2, Scheme Costs, p.8, paragraph 3.2.12) and therefore the scheme team technical specialists, including Quantity Surveyors, have had to apply a degree of judgement-based experience gained from working on other similar projects.

6.9.9 Once the 'impacts' and 'probabilities' have been estimated, the risks are mapped onto a 5-point risk matrix to generate an overall 'risk score' (Figure 6.3).

6.9.10 Each risk has been assigned a likelihood rating. This has been multiplied by the estimated financial value of the risk occurring, to give an expected value. The sum of these expected values forms the total Quantified Risk value. The P80 estimate output from the QRA was £15.59m. These costed risks equate to approximately 18.5% of the total construction cost including utilities. This risk value is included in Section 1.2 of the Financial Dimension.

Figure 6.3 – Risk criteria

Methodology

Project Risk Impact Criteria Model

Likelihood of risk occurring

Likelihood	Definition	Value
Almost Certain	The event is expected to occur in most circumstances	5
Likely	The event will probably occur in most circumstances	4
Possible	The event might occur at some time	3
Unlikely	The event is not expected to occur	2
Rare	The event may occur only in exceptional circumstances	1

Impact if risk occurs

Schedule	Costs	Performance / Quality	Value
<2 weeks delay	<1% of budget	Cosmetic impact only	1 Insignificant
2 weeks– 1 month	1%-<2%	Some minor elements of objectives affected	2 Minor
1 month-<2 months	2%-<8%	Significant areas of some objectives affected	3 Moderate
2 months-<4 months	8%-<12%	Wide area impact on some objectives	4 Major
>4 months delay	>12% of budget	Significant failure resulting in the project not meeting its objectives	5 Extreme

Impact

Likelihood	5	4	3	2	1
5	25	20	15	10	5
4	20	16	12	8	4
3	15	12	9	6	3
2	10	8	6	4	2
1	5	4	3	2	1

Risk Level Tolerances

Band	Risk Treatment
High 20-25 (Red Risks)	Risks analysed at this level are so significant that risk treatment is mandatory
Medium 6-16 (Amber Risks)	Risks analysed at this level require a cost/benefit analysis to take place to determine the most appropriate treatment
Low 1-5 (Green Risks)	Risks analysed at this level can be regarded as negligible, or so small that no risk treatment is required

Managing Risks

6.9.11 Following the initial assessment of scheme risks, a systematic approach was adopted to respond to risks and allocate responsibility to the most appropriate party in line with governance arrangements set out in Section 6.4. One of the following four strategies is adopted for each risk when developing a suitable response plan.

- Accept or tolerate consequences in the event that the risk occurs – In the event that a) the cost of taking any action exceeds the potential benefit gained; or b) there are no alternative courses of action available
- Treating the risk – Continuing with the activity that caused the risk by employing four different types of control including preventative, corrective, directive and detective controls (source: The Orange Book, HM Treasury, 2004)
- Transferring the risk – Risks could be transferred to a third party e.g. insurer or contractor
- Terminating the activity that gives rise to the risk

6.9.12 Development of the response plans to manage risks has been undertaken only where the likelihood of risk occurrence and impact can be cost effectively managed.

Implementation and Review

6.9.13 Effectiveness of the response plan is dependent on the proper implementation and review of the residual risk (including any secondary risk associated with implementation). Reviews of the status of scheme risk assessments and their related response plans (as part of project reporting) will be an integral part of progress meetings (and at the Project Board) during progression of detailed design and the construction period. All key risks will be formally reviewed at key decision points in the scheme lifecycle.

Transfer of Risk to the Contractor

6.9.14 Section 5.8 of the Commercial Dimension describes how the procurement strategy will seek to place risk with the party best placed to manage or mitigate that risk or manage the consequences should they transpire. The risks on which the council will need to take a view have been noted within this section.

6.10 Lessons Management

6.10.1 Lessons management is a key element of an approach to continuous improvement and commitment to delivery excellence. Learning from experience and harnessing lessons learned makes a significant contribution to successful project delivery. Ensuring lessons learned from historic or current successes or failures is therefore paramount to the delivery of the WWHAR scheme.

6.10.2 Lessons should be captured, understood, and communicated to the wider project team to inform delivery based on current or past experience. The WWHAR scheme's approach to lessons management is as follows:

- Lessons learned are captured throughout the delivery of the scheme

- Lessons learned are shared with the wider WWHAR team, including delivery partners and major stakeholders
- Lessons learned are adopted where applicable and beneficial across the WWHAR programme

6.10.3 NCC have established a lessons management and communication plan from the outset of the OBC. From this, the Project Manager is responsible for ensuring lessons are captured and communicated to the wider project team on a regular basis.

6.10.4 The following lessons learnt have been identified at this stage of scheme delivery:

- Early liaison is required with DfT regarding land value uplift (LVU) approach
- Ensure a detailed programme from all delivery partners is combined at an early stage
- Capture and finalise the assumptions which have been made around the scheme and growth area ahead of completion of the modelling to inform the OBC

6.10.5 Opportunities will be taken, wherever possible, to improve delivery processes by acting upon the identified lessons learnt. These will be monitored and managed as the scheme progresses to FBC stage.

6.11 Benefits Management Plan

6.11.1 A high-level Benefits Realisation Plan has been prepared for the WWHAR scheme. The plan is designed to enable benefits, and disbenefits, that are expected to be derived from the scheme to be planned for, managed, tracked, and realised. The plan will help demonstrate whether the scheme objectives identified are able to generate the desired ‘measures for success’. This can be assessed by tracking and realising the desired outputs and outcomes of the project.

6.11.2 Enabling changes are those tangible effects that are funded and produced directly as a result of the scheme. Benefits experienced are the final impacts brought about by the scheme in the short, medium and long-term. The scheme objectives, together with the desired changes and benefits, are summarised in Table 6.7.

Table 6.7 – Benefits realisation plan

Objective Supported	Enabling changes	Benefits experienced	Who will benefit	Benefit owner
To drive economic growth by supporting housing delivery, employment growth and Levelling Up in King's Lynn	Provision of new access road: attract new residents to live and work in West Winch by unlocking commercial land to create jobs	Unlocking economic growth by providing new transport capacity / encouraging new residents to commute using active modes and public transport into West Winch and King's Lynn	Residents / employees / wider community	NCC / BCKLWN
To enhance the A10's role as a strategic link supporting the wider King's Lynn economy	Provision of new access road: to reduce exiting traffic congestion on existing A10	Reduced journey times along the existing A10 Making the local area more attractive Positive effects for businesses through higher productivity	Residents / employees / wider community	NCC / BCKLWN

Objective Supported	Enabling changes	Benefits experienced	Who will benefit	Benefit owner
To provide a more resilient road network to improve journey time reliability and safety for all users	Provision of new access road: safer walking and cycling environment, reduced traffic congestion	Reduced journey times on existing A10 and A47 Reduced levels of congestion in local area Greater active mode travel safety	Residents / employees / wider community	NCC / BCKLWN
To improve the quality of life for residents of West Winch by reducing the volume of non-local journeys through the village	Provision of new access road: remove through traffic from West Winch, providing an alternative route through the village	Reduced severance effect on local community due to traffic congestion relief Improved well-being of local residents by improving GHG emissions and local air quality	Residents / employees / wider community	NCC / BCKLWN
To provide better conditions in West Winch and along the A10 for travel by non-motorised modes	Provision of new active travel infrastructure: segregated cycle route, leading to a safer environment for NMUs	Mode shift from car to active modes Increased levels of walking and cycling Greater active mode travel safety	Residents / employees / wider community	NCC / BCKLWN

Objective Supported	Enabling changes	Benefits experienced	Who will benefit	Benefit owner
To increase active mode connectivity with the wider public transport network	Provision of new active travel infrastructure: more direct routes/links to bus stops/ railway stations	Increased active mode transport accessibility to jobs in the wider area Mode shift from car to active modes Increased levels of walking and cycling	Residents / employees / wider community	NCC / BCKLWN
To reduce carbon emissions and improve local air quality by alleviating congestion, supporting the decarbonisation agenda	Provision of new access road: reduced excessive traffic on existing A10 and A47	Reduced fuel consumption due to less stop/starting in traffic congestion Improved well-being of local residents by improving GHG emissions and local air quality	Residents / employees / wider community	NCC / BCKLWN

6.12 Monitoring and Evaluation Plan

6.12.1 A high-level Monitoring and Evaluation Plan has been prepared for the WWHAR scheme, as set out in Table 6.8. The DfT's 'Monitoring and Evaluation Framework for Local Authority Major Schemes' guidance document forms the basis of the monitoring strategy, alongside the assurance process.

6.12.2 The DfT guidance sets out the requirements for the monitoring of schemes and outlines three tiers of monitoring and evaluation, these are:

- Standard monitoring

- Enhanced monitoring
- Fuller evaluation

6.12.3 It is proposed that the WWHAR scheme follows enhanced monitoring practice as the scheme is likely to be more than £50m in value.

Table 6.8 – Monitoring and evaluation plan

Objective	Enabling objective / outcome	Performance indicator	Methodology	Timescale	Owner of Monitoring Task
To drive economic growth by supporting housing delivery, employment growth and Levelling Up in King's Lynn	Provide additional highway capacity to accommodate increases in travel demand due to new housing and employment growth	Ability to unlock growth Scale of catchment (jobs, housing)	Land use surveys and land value change assessments	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To enhance the A10's role as a strategic link supporting the wider King's Lynn economy	Improve accessibility to jobs and opportunities through a reduction in journey times	Reduced journey times along the existing A10	Traffic counts Before and after implementation queue length	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To provide a more resilient road network to improve journey time reliability and safety for all users	Improved journey times and reliability on the existing A10 and A47	Propensity to reduce congestion/delay	Before and after implementation queue length survey	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To improve the quality of life for residents of West Winch by reducing the volume of non-local journeys through the village	Removed through traffic, including HGVs, through the village	Reduced journey times for local journeys	Traffic counts	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To provide better conditions in West Winch and along the A10 for travel by non-motorised modes	Improved road safety for all road users	Road safety Ability to contribute to a reduction in vehicular road traffic	Assessment of road traffic collisions Non-motorised user counts Traffic counts	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To increase active mode connectivity with the wider public transport network	Improved connectivity for pedestrians and cyclists to bus stops/railway stations	Increase in active travel network capacity	Active travel surveys	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN
To reduce carbon emissions and improve local air quality by alleviating congestion, supporting the decarbonisation agenda	Improved quality of life by improving GHG emissions and local air quality	Environment (air quality and carbon reduction)	Before and after air quality monitoring using air quality measurement facilities	Pre delivery / post opening (up to 5 years)	NCC / BCKLWN

6.13 Data and Information Security

UK General Protection Regulation (UK GDPR)

6.13.1 Regulation (EU) 2016/279 of the European Parliament and the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation), known as the GDPR, came into force on 25 May 2018 alongside the Data Protection Act 2018 (DPA 2018). The DPA 2018 tailored the GDPR in the UK, defining UK specific exemptions and interpretation.

6.13.2 The GDPR continues to apply in the UK post Brexit; it is retained in English law under the (amended) DPA 2018 as the UK GDPR. The UK GDPR must be read alongside the DPA 2018 which together create a single UK data protection regime.

6.13.3 The UK GDPR sets out seven key principles which will guide the scheme's approach to processing personal data. These are outlined below in the context of actions the WWHAR scheme will undertake:

- Lawfulness, fairness and transparency – Processing Personal Data will be considered from the perspective of the Data Subject
- Purpose limitation – Processing Personal Data will be permitted for the specified purpose ONLY
- Data minimisation – The WWHAR scheme will not ask for, retain or give out more Personal Data than is required for a specific purpose.
- Accuracy – The WWHAR scheme will ensure personal data is up to date and accurate
- Storage limitation – The WWHAR scheme will ensure that Personal Data is only kept for as long as the purpose specified to the Data Subject exists

- Integrity and confidentiality (security) – The WWHAR scheme will ensure appropriate access controls, confidentiality and IT security for Personal Data
- Accountability – The WWHAR scheme will appoint an individual to take responsibility for UK GDPR compliance

6.13.4 The scheme will adopt a 'data protection by design and default' approach as recommended by the UK Information Commissioner's Office. This will include it approach when adopting a level 2 BIM approach in line with PAS:1192-2 and PAS:1192-3, British Standards Institute 2013/2014, best practice guidance and establishing a Common Data Environment (CDE) in line with PAS:1192 guidance. A robust information management system will support NCC meet its GDPR and information security obligations.

6.14 Carbon Management Plan

6.14.1 A Carbon Management Plan (CMP) has been prepared as part of the OBC. This can be found as a standalone document in Appendix P (refer to separate document). The CMP supports the development and implementation of a carbon management process within the programme which supports low carbon infrastructure planning and delivery.

6.14.2 The CMP has been developed in alignment with the principles of PAS2080:2023 (further detail can be found on the BSI Group website), which defines carbon management as the "assessment, reduction and removal of greenhouse gas emissions during the planning, optioneering, design, delivery, operation, use, end of life (and beyond) of new, or the management of existing, assets, networks and/or systems".

6.14.3 The purpose of the carbon management process is to manage and reduce the GHG (carbon) emissions over the course of the WWHAR project lifecycle. This can be achieved through taking actions that maximise whole-life emission reduction impacts (e.g., modal-shift) and minimising impacts that increase emissions (e.g., embodied carbon). These actions must be informed

by carbon assessments that provide an understanding of the whole-life carbon impact.

6.14.4 The plan sets out the first whole life carbon assessment of the WWHAR scheme. The current baseline estimated whole-life impact is 54,289 tCO_2e over 60 years. A full breakdown of the key impacts that make up this whole-life impact can be found in Appendix P.

6.15 Project Closure

6.15.1 Following each Gateway Review, a decision will be made by the Project Board to close the completed phase and move to the next. The following activities will need to take place before the administrative closure of the WWHAR scheme:

- Completion of a Project Closure Report
- Finalisation of the Benefits Management and Monitoring and Evaluation Plan by the SRO
- Individual close out reports from all contracts confirming final positions in terms of spend and contract obligations
- Health and Safety File for the completed WWHAR assets
- Register of outstanding or residual risks/issues that will transition into the operational phase of the scheme
- Stakeholder feedback and Lessons Learned to be captured and shared

6.15.2 A robust document archiving exercise will also be completed to ensure that programme documentation is available to the WWHAR operations phase as required.

6.16 Summary

6.16.1 An appropriate governance structure is essential to the delivery of the scheme. It is evident that NCC are experienced in the delivery of highway schemes, therefore the governance structure for the proposed WWHAR

scheme builds on a tried and tested approach. A contractor with significant experience in delivering similar large-scale highway schemes will also be selected during the procurement process.

6.16.2 Although crucial to the delivery of the WWSGA, the housing access road is not dependent on any prior schemes or projects and can be delivered independently.

6.16.3 A project programme has been developed that sets out the key project tasks, their duration and interdependencies, key milestones and gateways for the WWHAR scheme. This will act as a live document and will enable the Project Manager to monitor and manage progress.

6.16.4 The project has appropriate assurance and approvals processes in place, with progress being tracked through the gateway review process by Local Partnerships.

6.16.5 The principles, purpose, stakeholders and communications activities are largely shared between the strategic growth area and the housing access road. As such, a joint communications and engagement strategy and delivery plan has been developed by NCC to ensure clear, consistent and coordinated communications activities. This is a live document that will be updated throughout the delivery of the project.

6.16.6 A robust risk management process is in place for the scheme, which enables risks for the project to be identified, quantified and managed. Lessons learned will be tracked and communicated for the benefit of both ongoing delivery, and future schemes.

6.16.7 Both Benefits Realisation plans and Monitoring and Evaluation plans have been outlined within the case which will ensure the benefits the scheme is expected to deliver are delivered, and the scheme is evaluated post-construction. The plans will be further developed as the project progresses.