

**Land South and East of Adastral Park
Ipswich**

Updated Transport Assessment

Carlyle Land Ltd and Commercial Estates Group

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Executive Summary

Brookbanks Consulting (BCL) is appointed by Carlyle Land and Commercial Estates Group to produce a Transport Assessment and Travel Plan to accompany a planning application for a primarily residential development on Land South and East of Adastral Park, Ipswich.

The proposed development will comprise up to 2,000 homes, an employment area of 0.6ha (use class B1), primary local centre (comprising use classes A1, A2, A3, A4, A5, B1, C3, D1 and D2), secondary local centre (comprising possible use classes A1, A3, A5 and D2), a school, green infrastructure (including Suitable Accessible Natural Greenspace (SANGs)), outdoor play areas, sports ground and allotments / community orchards), public footpaths and cycleways, vehicle accesses and associated infrastructure.

In support of the development proposals, BCL has worked in conjunction with Suffolk County Council (SCC), Suffolk Coastal District Council (SCDC) and Highways England (HE) representatives to work towards agreement on all highways matters, including trip generation forecasts, traffic modelling methodology and results, together with the production of a package of mitigation measures to enhance the highway network and accessibility of the area while mitigating for transport impacts of the development proposals. Discussions are still on going with the aim of seeking full agreement on all matters.

In relation to transport policy, the proposed development accords with national, regional and local transport and land-use policies. These support the aim to promote sustainable development that seeks to ensure wider travel choices in the form of the most sustainable forms of transport and thus reduce the use of the private car particularly for single person use.

A number of vehicular accesses are proposed into the existing highway network. The delivery of the access strategy will be phased in parallel to the delivery of the development quantum. The site will be accessed from a signalised junction along the A12 with two priority junctions off Ipswich Road. Adastral Park is an existing employment area, also accessed from the A12. During Year 6 of the operation of the development, a further access will be delivered to the north of the site across land that is currently under ownership of BT, and will be released to the developer. The access strategy for the proposed development will not prejudice the existing access points and will coalesce seamlessly.

The potential impacts on the highway network have been assessed on a calibrated and validated Paramics Micro-simulation traffic model. This has assessed the locations within the local highway most likely to be effected.

Arrangements to enhance public transport provision are provided together with new and enhanced footways and cycleways in the area which will reduce the need to travel by private car.

Pedestrian connections to the neighbouring suburb of Martlesham are proposed to be enhanced through the provision a pedestrian/cycle crossing across the A12 Dual Carriageway with the Access Junction to the site. Pedestrian connections will also be included alongside the A12 and the former alignment adjacent to Adastral Park.

Public transport services are to be enhanced through providing additional bus services supplied by Ipswich Buses. For Phase One of the development, Route 4 will be diverted to provide peak and lunchtime facilities. For Phase Two of the development, Route 4 will be extended to operate throughout the day every 30 minutes. For Phase Three of the development, Route 4 will be extended to operate throughout the day every 20 minutes to give a faster journey into town with potentially improved links to the train station. It is expected that the developer will offer these contributions for five years from the initial opening year of Phase 1 of the development or until the routes are self-funding.

It is agreed that a key component of the transport mitigation measures is the implementation of a comprehensive Travel Plan (TP), which is of a sufficient scale and effective. The Travel Plan proposes a target for the site which will reduce the mode share by single occupancy vehicles by 15%.

The final components of the package of transport mitigation measures are the provision of highway improvements either directly by the developer or through developer contributions at various locations neighbouring the site.

The potential impacts on the highway network have been tested. This has resulted in the identification of a range of offsite interventions that will delivered by the development. This includes:

- **A14 / A12 / A1156 Interchange:** Circulatory Traffic Signals to be introduced on the A12 Approach Arm, the A14 Westbound Off-slip and the A1156 Felixstowe Road. Free-flowing Left-turn Lanes to be introduced from the A14 Westbound Off-slip into the A1156 Felixstowe Road and the A14 Eastbound Off-slip into the A12 Dual Carriageway. Bucklesham Lane Approach Arm to remain unchanged.
- **A12 / Newbourne Rd / Foxhall Road Roundabout:** Widening of existing roundabout to provide 3 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. A12 Northbound and Southbound approaches also to be signalised. Newbourne Road to be widened to two lanes with a two-lane flare on approach. Foxhall Road to be widened to two lanes with a two-lane flare on approach.
- **A12 / Barrack Square / Eagle Way Roundabout:** Widening of existing roundabout to accommodate 3 lane approaches for the A12 Northbound and Southbound over 80m length, which will also be signalised. Barrack Square to be widened to two lanes

with three lane flare on approach. Two lane exit from roundabout with lane 1 for left turners for Gloster Road. Eagle Way Approach to remain unchanged.

- **A12 / Anson Road / Eagle Way Roundabout:** Widening of existing A12 Southbound Approach to accommodate 3 lanes over 80m length and signalised. Signalisation of A12 northbound approach. No alteration to Anson Road or Eagle Way approaches.
- **A12 / A1214 Roundabout:** Traffic – optimised signal timings.
- **Gloster Road / Barrack Square Priority Junction:** Capacity Widening of Bellmouth to provide a Left-turn Lane for Barrack Square into Gloster Road.

This represents a comprehensive package of interventions delivered through, and arising from, the development.

Overall, the development provides mitigation in relation to the transport networks and aims to minimise travel through the implementation of the Travel Plan to sufficiently minimise the impact of the development on the highway network. Good connectivity is afforded to the surrounding urban area and accessibility to a range of key services, facilities and opportunities has been provided.

In summary, the proposals demonstrate that a well-considered approach to developing transport and highways proposals for the development is able to ensure the proposals are able to meet national, regional and local policy and guidance.

1 Introduction

- 1.1 Brookbanks Consulting Limited (BCL) is appointed by Carlyle Land Limited (“Carlyle Land”) and Commercial Estates Group to produce a Transport Assessment (TA) and Travel Plan (TP) for a proposed development on land at Adastral Park.
- 1.2 Through initial discussions with Suffolk County Council (SCC) and Highways England (HE) the broad scope of the Transport Assessment has been agreed. The objective of the study is review the application in detail and to demonstrate that the development proposals are acceptable from a transportation and highways viewpoint.
- 1.3 Carlyle Land and Commercial Estates Group consider the development of this site to represent an appropriate and deliverable location for development.

2 Background Information

Site Location

- 2.1 Ipswich is a town located in the County of Suffolk, located circa 100 km north-east of London. The site is located circa 10km to the east of the town centre.
- 2.2 The site location is shown on Figure 2a below.



Figure 2a: Site location

Scheme Proposals

- 2.3 It is proposed to develop the site for a new sustainable development delivering residential use together supporting employment and educational land uses. The Proposed Development comprises the delivery of the following primary land uses:
 - Up to 2,000 homes
 - Employment area of 0.6ha (use class B1)

- Primary local centre (comprising use classes A1, A2, A3, A4, A5, B1, C3, D1 and D2)
- Secondary local centre (comprising possible use classes A1, A3, A5 and D2)
- Primary and secondary school provision
- Green infrastructure (including Suitable Accessible Natural Greenspace (SANGs))
- Outdoor play areas
- Sports ground and allotments / community orchards
- Public footpaths and cycleways
- Vehicle accesses and associated infrastructure.

- 2.4 In addition to the development quantum being applied for, there is a possibility of delivering additional employment space on Adastral Park. This additional employment area is known as the Northern Quadrant ("NQ"). Whilst this additional employment space on the NQ does not form part of the planning application, its development in the medium term is possible, and thus an assessment of the effect of this additional quantum of development has been undertaken within the Environmental Statement for the purposes of assessing cumulative effects.
- 2.5 The development will consist of several distinct areas, with each area having a strong landscape and green infrastructure framework, which will define and shape the development.
- 2.6 The application provides for some 2,000 dwellings that will build on the existing character of the area. The layout comprises a series of residential land parcels developed on a connected network of routes. The development will provide strategic landscaped areas. These areas will provide attractive informal open and/or amenity space. The landscaped areas will provide attractive informal open and/or amenity space.
- 2.7 The Illustrative Framework Masterplan attached in Appendix B, sets out built development components, areas of formal and informal open space and the alignment of the primary strategic transport routes running through the application site. Key layout principles are embedded within the Parameter Plans and illustrated through the Illustrative Framework Masterplan:
- 2.8 The development will be comprised of walkable residential neighbourhoods around distinct character areas. Each neighbourhood benefits from access to key areas of formal and informal open space.
- 2.9 Opportunities for strategic footpath / cycle linkages into the wider network will be exploited, connecting adjoining locations within the wider Martlesham area to the application site.
- 2.10 Legibility of the development will be ensured by developing a positive relationship between buildings, streets and spaces, with buildings fronting onto and providing opportunities for overlooking and surveillance. In addition, ensuring there is a strong definition of public (streets, opens space) and private spaces (back gardens, private driveways) making the layout legible and safe.
- 2.11 The development will establish a rich and diverse green infrastructure strategy incorporating existing trees and hedgerows and connecting parks, play areas, formal sports pitches, and wildlife habitats.

Transport Assessment Consultations

- 2.12 In preparation for the planning application submission, detailed discussions have been held with SCC over an extended period of time, and these continue. Various aspects covering the delivery of the scheme have been discussed with the majority of the fundamental principles addressed and agreed. This has led to a coordinated approach to agree key aspects of scheme delivery.

- 2.13 This process has resulted in working agreements across various several areas of the assessment as demonstrated in the agreed scoping note contained in Appendix A, including the following key areas:
- Location and the form of the access points
 - Methodology to be adopted in order to review the development
 - Use of the area wide traffic model for the high level overview
 - Growth Rates
 - Method of trip distribution
 - Travel Plan principles.
- 2.14 Detailed discussions are continuing regarding trip generation rates albeit it is considered that adopting differing rates within the spectrum of assumptions assessed will not materially alter the conclusions on the overall impact of the scheme or the mitigation required.

Transport Assessment Structure

- 2.15 The report incorporates appropriate text that reflects the agreed matters and the remainder of the report is structured in the following way:

Chapter 3: National and Local Policy Background: This chapter reviews both National and local planning and transport policy documentation to demonstrate that this site is supported for residential use.

Chapter 4: Existing Transport Conditions: This chapter details the site location in relation to the public transport, walking, cycling networks, together with the road network.

Chapter 5: Development Proposals: This Chapter reviews the development proposals and details the proposed access arrangements.

Chapter 6: Development Impact Appraisal: This chapter assesses the development in relation to Accessibility, Safety, Economy, Environment and Integration.

Chapter 7: Travel Plan: This chapter provides details on the Travel Plan that has been drafted to support the proposed development, including measures to achieve the agreed modal shift targets.

Chapter 8: Development Traffic Generation: This chapter provides details on the expected number of trips generated by this site and the methodology on how they are to be distributed within the local road network.

Chapter 9: Road Network Review – Network Statistics: This chapter indicates the operation of the network as a whole.

Chapter 10: Road Network Review – Journey Times: This chapter provides a review of then impact on journey times within identified links contained within the model.

Chapter 11: Road network Review - Link Assessment: This chapter indicates the results of the assessment on link flows and speeds as predicted by the Paramics traffic model.

Chapter 12: Road network Review - Junction Assessment: This chapter indicates the results of the assessment on queuing at key junctions within the road network as predicted by the Paramics traffic.

Chapter 13: Limitations: This chapter defines the limitations on the above conclusions based on the accuracy of information received.

3 National and Local Policy Background

National Policy

- 3.1 Chapter 4 of the NPPF 'Promoting Sustainable Transport' sets out the Governments expectations that development should maximise sustainable transport solutions. Paragraph 30 of the NPPF encourages solutions that support reductions in greenhouse gas emissions and reduce congestion. Local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.
- 3.2 Paragraph 32 identifies that all developments generating significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:
- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure
 - Safe and suitable access to the site can be achieved for all people
 - Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.
- 3.3 Paragraph 35 of the NPPF identifies that plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore developments should be designed where practical to:
- Accommodate the efficient delivery of goods and supplies
 - Give priority to pedestrian and cycle movements and have access to high quality public transport facilities
 - Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones
 - Consider the needs of people with disabilities by all modes of transport.
- 3.4 A key tool to facilitate sustainable transport is the Travel Plan, as identified in Paragraph 36 of the NPPF. All developments which generate significant amounts of movement are required to provide a Travel Plan.
- 3.5 Paragraph 37 of the NPPF identifies that local planning policies should aim for a balance of land uses that minimise journey lengths for employment, shopping, leisure, education and other activities. Paragraph 38 notes that larger scale residential developments in particular should promote a mix of uses in order to provide opportunities to undertake day-to-day activities including work on site.
- 3.6 When setting local parking standards for residential and non-residential development, Paragraph 39 of the NPPF identifies that local planning authorities should take into account:
- Accessibility of the development
 - The type, mix and use of development
 - The availability of and opportunities for public transport
 - Local car ownership levels
 - An overall need to reduce the use of high-emission vehicles.
- 3.7 Paragraph 42-006 of the National Planning Practice Guidance states that the aims of a Travel Plan are to positively contribute to:
- Encouraging sustainable travel

- Lessening traffic generation and its detrimental impacts
- Reducing carbon emissions and climate impacts
- Creating accessible, connected, inclusive communities
- Improving health outcomes and quality of life
- Improving road safety
- Reducing the need for new development to increase existing road capacity or provide new roads.

3.8 NPPG Paragraph 42-011 states that a Travel Plan should evaluate and consider:

- Benchmark travel data including trip generation databases
- Information concerning the nature of the proposed development and the forecast level of trips by all modes of transport likely to be associated with the development
- Relevant information about existing travel habits in the surrounding area
- Proposals to reduce the need for travel to and from the site via all modes of transport
- Provision of improved public transport services

3.9 **HA Circular 02/2013** - The Strategic Road Network and the Delivery of Sustainable Development: The Circular was published in 2013 and explains how the HA will engage with the planning system and provides details on how the HA will fulfil its remit to be a delivery partner for sustainable economic growth whilst maintaining, managing and operating a safe and efficient strategic road network.

3.10 The Circular identifies that development proposals are likely to be acceptable if they can be accommodated within the available highway capacity on the strategic road network, or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. Furthermore it is noted that Paragraph 9 identifies that development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

3.11 Paragraph 25 identifies that the overall forecast demand should be compared to the ability of the existing network to accommodate traffic over a period up to ten years after the date of registration of a planning application.

3.12 Paragraph 27 identifies that where the overall forecast demand at the time of opening of the development can be accommodated by the existing infrastructure, further capacity mitigation will not be sought.

3.13 With regard to travel plans Paragraph 29 and 30 highlights that it may be possible to free up additional capacity within the road network so that the demand generated by a proposed new development, which would otherwise be unacceptable, can be accommodated.

3.14 Paragraph 34 identifies that at locations where there insufficient capacity, the impact of the development will be mitigated to ensure that the strategic road network is able to accommodate existing and development generated traffic.

3.15 In relation to providing new access points, Paragraph 39 identifies that where appropriate, proposals for the creation of new junctions or direct means of access may be identified and developed at the Plan-making stage in circumstances where it can be established that such new infrastructure is essential for the delivery of strategic planned growth

3.16 **Manual for Streets 1 and 2 (MfS)**: The UK Department for Transport (DfT) and the Department for Communities and Local Government (DCLG), with support from the Commission for Architecture and the Built Environment (CABE), commissioned WSP Group, Transport Research Laboratory (TRL), Llewelyn Davies Yeang and Phil Jones Associates to develop Manual for Streets to give guidance to a range of practitioners on effective street design.

- 3.17 The Manual for Streets (March 2007) guidance on the planning, design, provision and approval of new streets, and modifications to existing ones. It aims to increase quality of life through good design which creates more people-oriented streets. The detailed guidance applies mainly to residential streets although the overall design principles can be applied to all streets within urban areas.
- 3.18 A street is defined as "a highway with important public realm functions beyond the movement of motor traffic" – i.e. by its function rather than just the road hierarchy.
- 3.19 Manual for Streets has updated geometric guidelines for low trafficked residential streets, examines the effect of the environment on road user behaviour, and draws on practice in other countries. This research provides the evidence base upon which the revised geometric guidelines in the Manual for Streets are based, including link widths, forward visibility, visibility splays and junction spacing.
- 3.20 Manual for Streets 2 - Wider Application of the Principles is the result of collaborative working between the Department for Transport and the transportation industry.
- 3.21 The aim of the document is to extend the advantages of good design to streets and roads outside residential areas, largely covered in MfS1. By amending the way high streets and non-trunk roads are designed, the fabric of public spaces and the way people behave can be changed. It means embracing a new approach to design and breaking away from inflexible standards and traditional engineering solutions.
- 3.22 The new guide does not supersede Manual for Streets 1, rather it explains how the principles of the first document can be applied more widely.
- 3.23 **Design Manual for Roads & Bridges:** The DfT publish a large suite of documents known as the Design Manual for Roads and Bridges, which provides detailed standards and guidance on the provision of highway networks. The suite of documents provides a comprehensive manual which accommodates all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads including motorways. The standards are routinely adopted by local highway authorities for their local highway network.

Local Policy

Suffolk Coastal Core Strategy

- 3.24 Suffolk's core strategy is one of the first documents being produced as part of the Local Plan for the Suffolk Coastal area. . It sets out in strategic terms, the Council's overall approach to future development for the period to 2027, generally where it should take place and the key factors that need to be taken into account when considering individual proposals for development. It includes an outline for delivering strategic development needs, including housing, employment, leisure and retail. The Core Strategy also includes details of site specific allocations or policies for the management of new development. These are set out in separate Development Plan Documents.
- 3.25 The Core Strategy provides an overall spatial Vision for Ipswich, as indicated below.

The strategic approach to development in the Eastern Ipswich Plan Area can be divided into 3 sections – the area to be covered by the Martlesham, Newbourne & Waldringfield Area Action Plan; the main urban corridor of Kesgrave, Martlesham and Rushmere St Andrew; and the smaller settlements and countryside which surround these core areas.

The strategy for the Martlesham, Newbourne & Waldringfield Area Action Plan is one:

- i. that contains well-planned, sustainable new housing of a mix of size, type and tenure linked to existing and proposed employment;
- ii. where the planned direction of controlled growth is eastwards of the A12 to the south and east of Adastral Park;
- iii. where opportunities for new employment provision have been maximised, with major national and international companies sitting alongside smaller ones, particularly those associated with the strategically important hi-tech business at BT;
- iv. where the Martlesham Heath Business Campus including Adastral Park has been designated a Strategic Employment Area;
- v. where development has been phased and scaled to ensure that new or upgraded transport, utility and other social and community provision is provided in advance of, or parallel to, new housing and employment provision;
- vi. that has created its own distinctive identity with smaller readily distinguishable villages, neighbourhoods and communities within the larger area;
- vii. where public transport provision and foot and cycle paths have been upgraded and promoted to minimise the need to use private motor vehicles to access employment, schools and other key facilities;
- viii. where priority has been given to creating a safe and attractive environment, including the provision of advanced planting and landscaping to create new settlement boundaries that blend with the surrounding landscape and contribute to biodiversity and the ecological network;
- ix. that includes the retention of designated Sandlings areas on the edge of Ipswich because of their historic and biodiversity interests;
- x. that preserves and enhances environmentally sensitive locations within the Eastern Ipswich Plan Area and its surroundings; and
- xi. that maximises opportunities to achieve access to green space, including the countryside.
- xii. the Council will require further proposals to be supported by an Appropriate Assessment to meet the requirements of the Habitats Regulations. If the results of the Appropriate Assessment show that part of the Strategy cannot be delivered without adverse impacts on designated European sites which cannot be mitigated, then the proposals will only make provision for the level and location of development for which it can be concluded that there will be no adverse effect on the integrity of a designated European nature conservation site.

The transport and community infrastructure studies completed 2009 provide the background evidence to work with service providers and others to secure the necessary transport and other infrastructure to serve the proposed employment and housing. The November 2011 Appropriate Assessment and the mitigation measures it contains (section 7.2 and Table 10) will provide the basis for more detailed project level assessments associated with the Area Action Plan and planning application proposals and associated cumulative impacts. Those measures will be required to reflect the objectives set which include the creation of alternative opportunities for countryside recreation for existing and future residents as a preferred alternative to visiting European nature conservation sites; improved visitor infrastructure including wardening; and monitoring to quantify reductions in visitor harm achieved by mitigation projects.

Specifically, on land to the south and east of Adastral Park, strategic open space in the form of a country park or similar high quality provision will be required to mitigate the impact of development at this site and the wider cumulative impact of residential development on the relevant designated European nature conservation sites.

Infrastructure needs to be accorded priority include:

- a) Provision of and increased access to open space both on and off-site to meet the mitigation measures outlined in the November 2011 Appropriate Assessment. This includes enhanced wardening and monitoring of visitor impacts upon designated European nature conservation sites;
- b) Improvements to the water supply network;
- c) Upgrades to the waste water treatment (foul sewage) network;
- d) Provision of strategic drainage to manage surface water drainage within the site;
- e) Education facilities to meet identified preschool; primary and secondary needs within the development area;
- f) Health centre;
- g) Measures to manage impact on the local road network including improvements to the A12 between its junction with the A1214 and Seven Hills Interchange; to the A1214 and the Foxhall Road corridor;
- h) Improved public transport provision including links to Ipswich, Woodbridge and
- i) Improvements to the public rights of way network, including pedestrian and cycle links;
- j) Adequate electricity supply including an element of decentralised energy provision.

ansport Plan (2011-2031) – Part 1

- 3.26 The Suffolk Local Plan is prepared accordance to the statutory requirements. It sets out long-term transport strategy for the next 20 years. The aim of this strategy is to promote and aid economic resilience and private sector led growth through the current period of downturn, placing Suffolk in a position to emerge strongly as the economy recovers.

3.27 A number of key urban areas have been identified for growth where transport interventions can have significant impact which includes the Ipswich area. It is complemented by an implementation plan, presented in a separate document, which explains how the strategic priorities identified here will be delivered. Different interventions will be considered for different places. The common themes are identified for urban areas are:

Reducing the demand for car travel – This strategy will help people to travel more sustainably into and around the town. The purpose of this is to reduce car travel in Ipswich during peak times which would balance the demand with the limited capacity that is available and make it possible to improve public realm.

Efficient use of transport networks – The aim is to improve this by managing roads to minimise delays to buses, giving cyclists clear passage through traffic jams and by making it easier for people to walk across the road.

Improving infrastructure - Within the Ipswich area there is good public transport network connecting housing areas and employment sites. The proposed development will require additional bus lanes, interchange points and improved waiting facilities. Hence working with commercial bus operators will help in achieving this strategy.

3.28 The plan shows how transport will support and facilitate future sustainable economic growth by:

- Maintaining the local transport networks
- Tackling congestion
- Improving access to jobs and markets
- Encouraging a shift to more sustainable travel patterns.

3.29 Key issues to be addressed in Ipswich are as follows:

- Road condition
- Urban realm improvements
- Tackling congestion
- Modernisation of bus stations
- Reducing separation between town centre and waterfront
- Better facilities for walking and cycling
- Stronger neighbourhoods
- Longer term – crossing for improved access to wet dock island site
- Town centre masterplan
- A14 improvements
- Ipswich – Transport fit for the 21st Century
- Extensive Air Quality Management Areas
- A14 Orwell Bridge and Seven Hills Interchange Congestion

3.30 It is forecasted that there will be growth of 15,000 dwellings, with an additional 5,000 in neighbouring districts on the edge of the town. Most of this development in Ipswich will support regeneration of areas within the town, with a significant area of regeneration around the Waterfront and further development of education quarter.

3.31 Significant development in Ipswich, particularly employment. The development within the town should result in shorter journeys and will provide an opportunity to change the ways that people choose to travel. According to the traffic modelling it is anticipated that level of traffic growth is likely to grow by 15% by 2021. This could cause additional pressure on the A12/A14 at Copdock, Seven hills interchange and the Orwell Bridge.

3.32 The public transport in Ipswich is generally good, and provides good commercial services but there are some areas which are not served well. Currently, there is a lack of multi-operator ticketing which worsens this problem. The car park availability and pricing within the town is an important factor in the travel choices that need considering.

Parking standards

3.33 Parking standards for houses and apartments: For dwelling houses and apartments the council will aim to achieve the following minimum parking standards:

- Apartments; 1.5 spaces, where 1 space is allocated and another defined shared visitor space is provided for every 2 dwellings in communal parking areas.
- 2 bed units; 1.5 spaces, where 1 space is allocated and 1 space is provided for every 2 dwellings in defined bays within the public highway, 3+ bed units; 2 allocated spaces per dwelling.
- Plus 1 visitor space per 4 dwellings unallocated and provided in defined bays within the public highway or private drive.
- Integral or standalone garages will not be counted as a parking space unless they are an adequate size (currently 3x6 metres minimum clear internal dimensions).

4 Existing Transport Conditions

Existing Travel Behaviour Overview

4.1 The site is largely located in the Martlesham Ward. A review of 2011 Census data has been carried out.

4.2 The distance travelled to work is indicated in Figure 4a for residents aged 16 to 74 who were employed the week before the census.

Mode	Population	Percentage
Working at or from home	267	11.4%
Less than 2km	454	19.4%
2km to less than 5km	240	10.3%
5km to less than 10km	688	29.4%
10km to less than 20 km	287	12.3%
20km to less than 40km	128	5.5%
40km to less than 60km	31	1.3%
60km and over	31	4.7%
Other	111	5.7%
Total	2,339	100%

Figure 4a: Distance travelled to work

4.3 The Census data provides an indication of the distance travelled to work. This indicates that 19.4% of working people travelled less than 2km from home with a further 10.3% travelling between 2km and 5km. This demonstrates that circa 1 in 5 commuter trips stay within the immediate vicinity of the site. Therefore, this demonstrates that travel by sustainable mode is likely.

4.4 The Census statistics have also been integrated to identify the mode share for the residents of the Martlesham Ward. This considers the existing travel patterns of all residents aged 16 to 74.

Mode	Population	Percentage
Train	42	1.8%
Bus, minibus or coach	120	5.1%
Driving a car or van	1,554	66.0%
Passenger in a car or van	86	3.7%
Motorcycle, scooter or moped	18	0.8%
Taxi	3	0.1%
Bicycle	164	7.0%
On foot	193	8.3%
Work mainly at or from home	156	6.7%
Other method of travel to work	13	0.6%
Total	2,339	100.0%

Figure 4b: Mode Share – resident population

- 4.5 This demonstrates that the most dominant mode of travel is by car, resulting in 66.0% of all the trips within the Martlesham ward. This is followed by travel by foot or cycling, again demonstrating that travel by sustainable modes is likely.
- 4.6 A review of the mode share of employees working in the 010 ‘super output areas - middle layer’ has also been carried out. This analysis is presented below.

Mode	Population	Percentage
Train	45	0.6%
Bus, minibus or coach	341	4.4%
Driving a car or van	5,389	69.9%
Passenger in a car or van	265	3.4%
Motorcycle, scooter or moped	87	1.1%
Taxi	9	0.1%
Bicycle	561	7.3%
On foot	312	4.0%
Work mainly at or from home	680	8.8%
Other method of travel to work	25	0.3%
Total	7,714	100.0%

Figure 4c: Mode Share – daytime population

- 4.7 This demonstrates that the most dominant mode of travel is by car, resulting in 69.9% of all the trips within the Martlesham ward.

Existing Highway Network

- 4.8 The location of the site in relation to the local road network is indicated in Figure 4d.

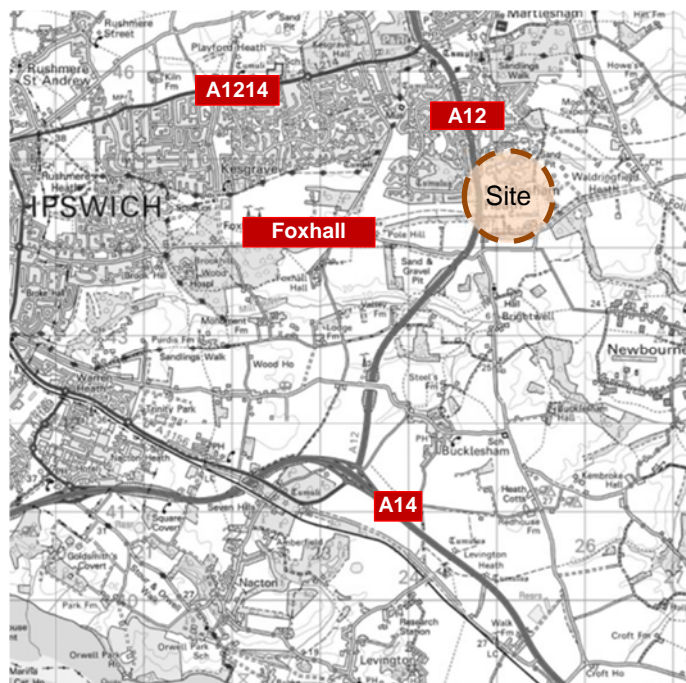


Figure 4d: Site Location in relation to the local road network

- 4.9 Adastral Park is located to the east of the A12 which provides a main route to Lowestoft and Great Yarmouth in the north. Adjacent to the site, the A12 is a dual carriageway road subject to a 70mph speed limit. Through discussions with SCC, the aspiration to reduce the speed limit has been identified.
- 4.10 To the north of the site, the A12 forms a four arm roundabout with Main Road (A1214). Main Road caters for east – west trips towards the northern area of Ipswich town centre. Main Road is a single carriageway road and is subject to a 30 mph speed limit. There are several junctions along Main Road which predominantly serve residential areas to the south.
- 4.11 Continuing from Main Road, the A12 continues in a southerly direction forming a four arm roundabout with Eagle Way and Anson Road. Eagle Way serves a residential area to the west, where Anson Road provides access into the Adastral Park employment area. The A12 continues to the site, providing a further connection to Eagle Way and Adastral Park via Barrack Square.
- 4.12 Some 1.6km to the south of the Barrack Square roundabout, the A12 forms a further a roundabout with Foxhall Road and Newbourne Road. Newbourne Road heads in an easterly direction and provides access to the hinterland to the south of the site. Foxhall Road heads in a westerly direction, providing an alternative route to Ipswich town centre.
- 4.13 The A12 continues to the south and connects with the A14. The A14 is a major international, national and regional route connecting Felixstowe to the M6 and M1.

Existing Sustainable Facilities and Services

Pedestrians and Cyclists

- 4.14 At the present day, the development land does not have any significant traffic generators within the boundary. As such, there has been no material requirement for footway / cycleway provision on site or to access the site.
- 4.15 To the north west of the site, there are existing pedestrian links to Martlesham Heath across A12 via a foot/cycle to the north of the junction with Barrack Square and via subway near the roundabout with Anson Road. The route along Gloucester

Road and Barrack Square has segregated footway/cycleway link. The footbridge and underpass also has a cycleway which facilitates cycle paths in eastern Ipswich and towards the town centre.

Public Rights of Way

4.16 Public Rights of Way (PRoW) are classified as highways and as such are protected routes. The 1949 National Parks and Access to the Countryside Act placed a duty on every County Council in England and Wales to draw up and publish a definitive map and statement of PRoW in their area.

4.17 The Definitive Map is the legal record of the location and status of PRoW. The statement is a description of the PRoW shown on the definitive map.

4.18 There are four classifications of PRoW:

- Footpaths - by foot only
- Bridleways - by foot, horse or bike
- Restricted byways - by any form of transport that doesn't have a motor
- Byways open to all traffic - let you travel by any form of transport, including cars

4.19 The following figure highlights the identified walking and cycling routes that are closest to the site.

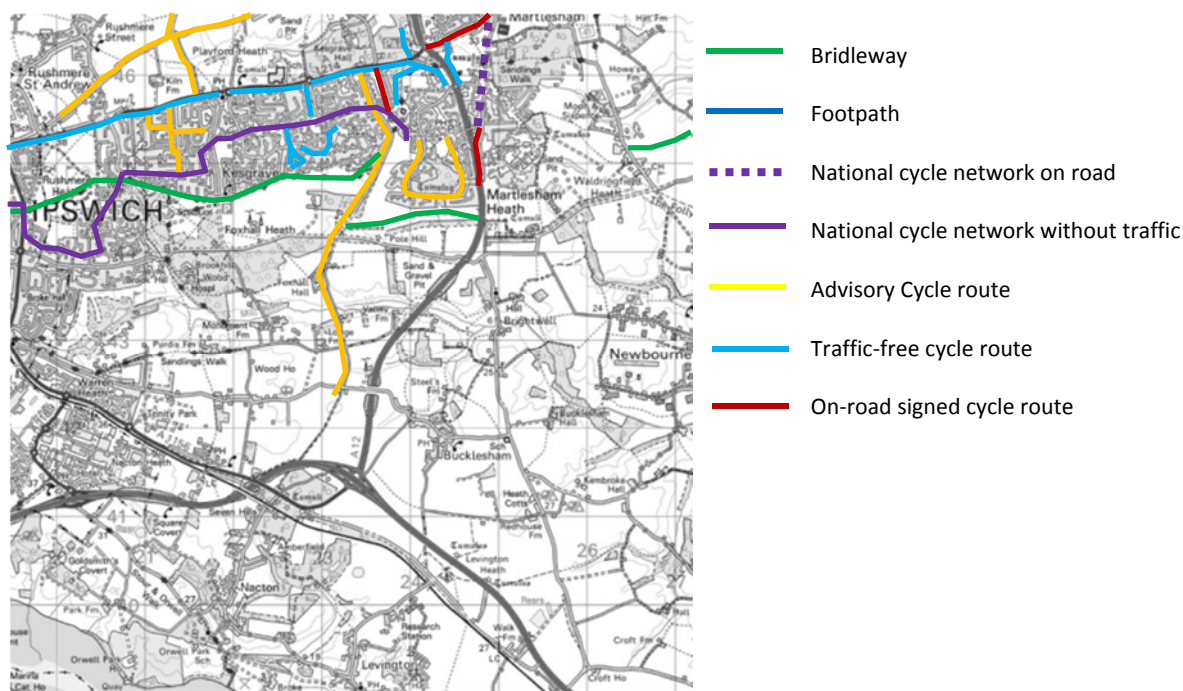


Figure 4g: Public Right of Way

Public Transport – Road

4.20 The existing bus services that operate close to the proposed site are identified in Figure 4d and Figure 4e. The bus route 66 currently serves high quality service to the existing park, which links Martlesham Heath-Grange Farm-Kesgrave - Ipswich. The bus service 173/174 (Woodbridge to Felixstowe) has just two services during peak hours. The rest of the buses also operate through Adastral Park.

Service	Destination	Frequency
H66/X66	Ipswich Town Centre – Adastral Park via Ipswich Rail Station Operator - First in Norfolk & Suffolk	Monday to Friday (except bank holidays): 3 buses operate in AM and PM
66/67	Martlesham Heath - Grange Farm - Kesgrave – Ipswich Operator - First in Norfolk & Suffolk	Monday to Friday (except bank holidays): Every 30 min Saturday: Every 20 min Sunday: Every 30 min
173/174	Woodbridge – Kirton – Trimley – Felixstowe Operator – Ipswich Buses	Monday to Friday (except bank holidays): Every 2 hrs Saturday: Every 2 hrs (between 9:05 and 15:55)
4	Ipswich Central – Felixstowe Road – Broke Hall – Bixley Operator - Ipswich Buses	Monday to Saturday (except bank holidays): Every 30 min
63/64/65 /65B	Ipswich – Leiston Operator - First in Norfolk & Suffolk	Monday to Friday: Every 30 mins
511	Halesworth – Holton Operator - First in Norfolk & Suffolk	Monday to Friday (except bank holidays): 1 hr 30 min
972	Ipswich Hospital - Kesgrave High - Bealings - Rushmere St Andrew Operator - First in Norfolk & Suffolk	Monday to Friday (School days only): Only 1 bus operates during PM Peak
512	Felixstowe - Nacton - Newbourne - Waldringfield – Kesgrave Operator - First in Norfolk & Suffolk	Monday to Friday (School days only): Only 1 bus operates during AM Peak Saturday & Sunday: No service

Figure 4e: Bus Routes closest to the site

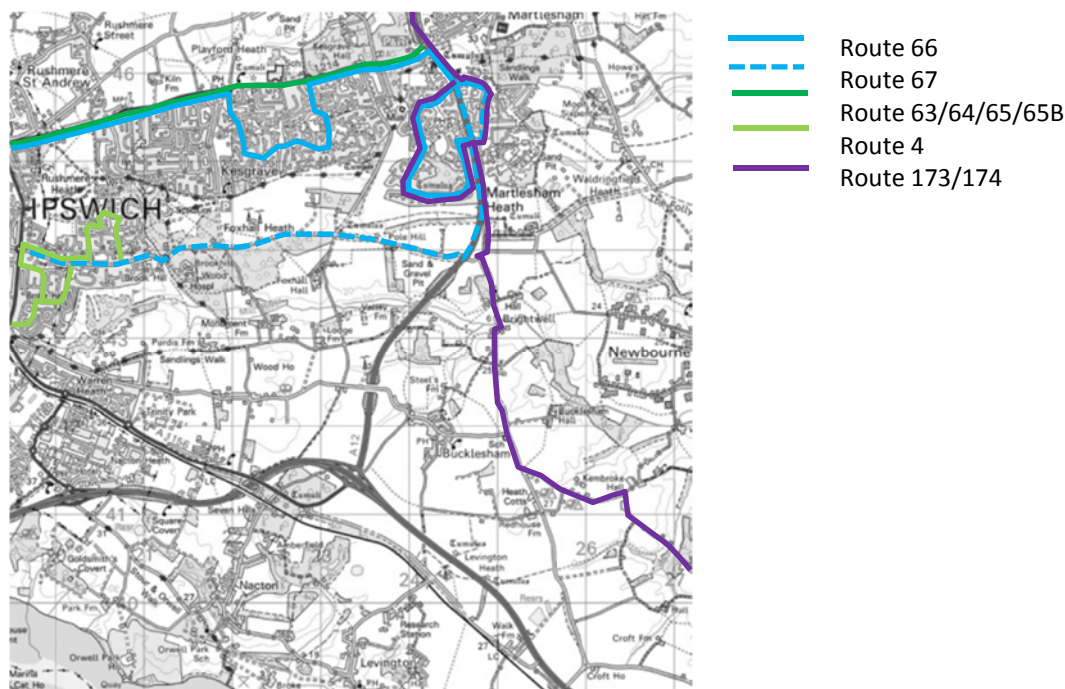


Figure 4f: Bus Routes map

Public Transport - Rail

- 4.21 The closest train station is located in Woodbridge. The stations provide excellent nodes for onward routes to Ipswich (having a journey time of circa 15 minutes) and Lowestoft (having a journey time of circa 1 hour 10 minutes).
- 4.22 The train station offers the following services:
- 72 space car park with accessible spaces open 24 hours
 - Self-service ticket machines

- Manned help desk
- Cash machine
- Pay phones
- Post box
- Public WiFi
- Refreshments
- Shops

Accident Analysis

4.23 Data were obtained from Suffolk County Council pertaining to all personal injury road accidents (PIAs) reported as occurring during the five year period up to the end of August 2016 for all of the roads in the vicinity of the site and shown in Figure 4g as follows.



Figure 4g: Accident study area

4.24 The accidents are classed into one of three categories based on the severity of the most seriously injured casualty:

- **Fatal injury:** Injuries which cause death either immediately or any time up to 30 days after the accident;
- **Serious injury:** Injuries for which a person is detained in hospital as an in-patient or any of the following injuries whether or not the casualty is detained in hospital; fractures, concussion, internal injuries, severe cuts and lacerations, severe general shock requiring medical treatment and injuries resulting in death more than 30 days after the incident;
- **Slight injury:** Injuries of a minor nature such as sprains, bruises or cuts not judged to be severe, or slight shock requiring only roadside attention.

4.25 Eight accidents on minor roads unlikely to be frequented by development traffic were omitted from the analysis, leaving a total of 144 accidents on the roads in question. These accidents resulted in a total of 198 casualties. One accident resulted in fatal injury to a young child when a rear shunt occurred and an incorrectly strapped child seat failed. A further 16 incidents resulted in serious injury.

	Number of PIAs				Casualties
	Slight	Serious	Fatal	Total	
Year 1 to end Aug'12	20	3	0	23	35
Year 2 to end Aug'13	29	3	0	32	47
Year 3 to end Aug'14	34	4	0	38	45
Year 4 to end Aug'15	24	5	0	29	43
Year 5 to end Aug'16	20	1	1	22	28
5 year period total	127	16	1	144	198

Figure 4h: Total number of PIAs by year and severity, with casualties

- 4.26 The number of accidents appears to have risen in the second and third year but returned to the starting level by the fifth year. The most notable overall feature of the accidents is that over half of them (51%) involved a rear end shunt. It is also noted that 39 or 27% of the accidents were reported to involve at least one driver (or rider) aged 23 or under. 21% of all accidents involved at least one rider of a 2-wheeled vehicle.
- 4.27 A plot of the locations of the accidents indicated five distinct clusters at roundabouts on the A12. These can be seen in Figure 4j below and the sites are listed in Figure 4i.

	Number of PIAs				Casualties
	Slight	Serious	Fatal	Total	
C1: A12 jw A1214	15	2	0	17	22
C2: A12 jw Anson Road	12	1	0	13	15
C3: A12 jw Eagle Way	9	3	1	13	17
C4: A12 jw Foxhall Road	15	0	0	15	21
C5: A12 jw A14(T)	21	3	0	24	36
5 year period total	72	9	1	82	111

Figure 4i: Total number of PIAs by year and severity, with casualties for each identified cluster of accidents

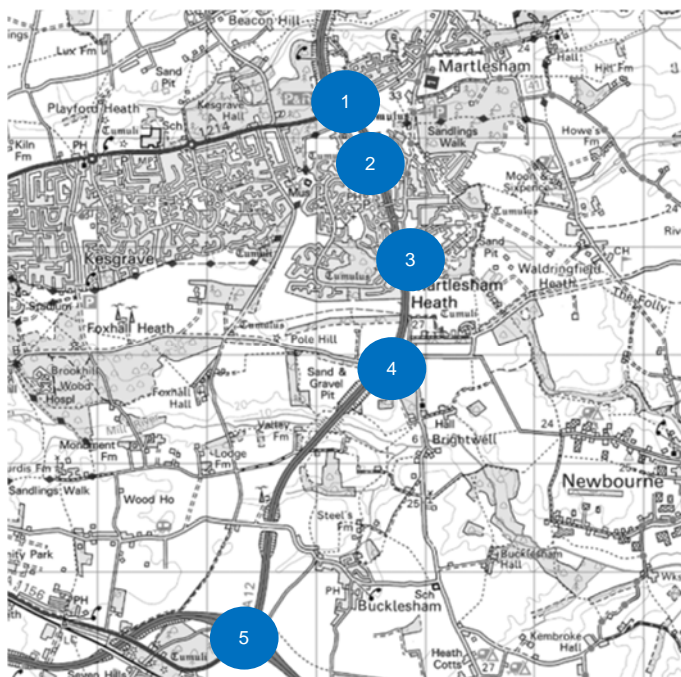


Figure 4j: Accident clusters

Cluster 1 – A12 jw A1214 Main Road

- 4.28 This junction is shown as “Cluster 1” on Figure 4j. It includes the signalised junction at Portal Avenue, just west of the roundabout. A total of 17 PIAs were reported at this location during the 5-year study period, equivalent to 3.4 PIAs per annum. Of these none resulted in fatal injury but two resulted in serious injury, in both cases, to a motorcyclist.
- 4.29 Nine of the 17 accidents involved rear end shunts, but perhaps more significant than this is the fact that seven of them involved at least one 2-wheeled vehicle. In all, two pedal cycles and six motorcycles were involved. There are no clear common factors however indicating any particular site-specific problem for 2-wheeled vehicles.
- 4.30 The accidents are generally spread out around the junction although four did occur at the traffic signals at Portal Avenue just west of the roundabout and another cluster, of seven accidents occurred on the A12 southbound approach.
- 4.31 Overall, it is concluded that there are no specific problems at this location such as might lend themselves to ameliorative intervention.

Cluster 2 – A12 jw Anson Road

- 4.32 This junction is shown as “Cluster 2” on Figure 4j. A total of 13 PIAs were reported here during the 5-year study period, equivalent to 2.6 PIAs per annum. Of these none resulted in fatal injury but one did result in serious injury. The accidents are on a distinctly reducing trend with 5, 3, 3, 2 and 0 occurring during successive 12-month periods.
- 4.33 Almost half of the 13 accidents involved rear end shunts, with the other half occurring as a result of a vehicle changing lane. Eight of them occurred during the evening peak period. A fairly high proportion of the accidents occurred during the hours of darkness and on a wet road surface.
- 4.34 The accidents were generally spread out around the junction but with a concentration of five rear shunt accidents on the southbound approach. In view of the absence of any reported accidents in the final 12-months of the survey period it is concluded that there is no significant problem at this location.

Cluster 3 – A12 jw Eagle Way

- 4.35 This junction is shown as “Cluster 3” on Figure 4j. A total of 13 PIAs were reported at this location during the 5-year study period, equivalent to 2.6 PIAs per annum. Of these one accident resulted in fatal injury and three resulted in serious injury. The accidents also appear to be on a generally rising reducing trend with 1, 2, 3, 4 and 3 occurring during successive 12-month periods.
- 4.36 Nine of the 13 accidents involved rear end shunts, six on the northbound approach to the island. The only other notable pattern is that 5 of the accidents involved young drivers/riders aged 23 and under and a further two involved elderly drivers aged over 80 years old.
- 4.37 The fatal accident that occurred here was due more to a vehicle defect (poor fitting of a child seat) than any fault with the junction itself. The remaining accidents do not indicate any particular problem, being fairly typical of a busy roundabout such as this. There may be some scope for improved advance signing of the junction on the A12 approaches together with larger chevron signs, but visibility is generally good and the benefits of such measures might be limited.

Cluster 4 – A12 jw Foxhall Road

- 4.38 This junction is shown as “Cluster 4” on Figure 4j. A total of 15 PIAs were reported at this location during the 5-year study period, equivalent to 3.0 PIAs per annum. Of these none resulted in serious or fatal injury and although the numbers did rise over the first three years, they reduced again in the final year.
- 4.39 Again, the accidents are characterised by a predominance of rear end shunt types (11 of the 15 accidents), with five occurring on the Foxhall Road approach and three on each of the A12 approaches. There are no other notable common features.
- 4.40 Again, there might be an argument for checking advance visibility and signing at this junction but there are no clear indications that anything is amiss with the current layout that is contributing to the fairly high number of rear end shunts here.

Cluster 5 – A12 jw A14(T) Seven Hills Roundabout

- 4.41 **This junction is shown as “Cluster 5” on Figure 4j. A total** of 24 PIAs were reported here during the 5-year study period, equivalent to 4.8 PIAs per annum. Of these none resulted in fatal injury but three did result in serious injury.
- 4.42 Yet again, the most (and only) notable common factor amongst the accidents occurring at this location is the predominance of rear end shunts. In this case, 79% of all of the accidents were of this type. The locations of the shunts were as follows:
- A14(T) eastbound off-slip = 2
 - A14(T) eastbound left to A12 north = 1
 - A12 southbound approach = 2
 - A14(T) westbound off-slip = 7
 - A1156 northbound approach = 6
 - On circulatory carriageway=1
- 4.43 This is another case of drivers appearing not to be adequately warned of the need to slow down as they approach the roundabout. There are no obvious problems with the current layout but it could be improved with any or all of the following: better advance warning signs, countdown boards, direction signs, larger chevrons on the splitter and central islands and possibly also some yellow bar markings on the A14(T) off-slips.

Accident Summary

- 4.44 144 personal injury accidents were reported to have occurred within the study area during the most recent 5-year period for which information is available at the time of writing. This included one fatal accident. Overall there does appear to be a quite high proportion of accidents resulting from rear end shunts.
- 4.45 Five clusters of accidents have been identified, all at roundabout junctions on the A12. None of these junctions appear to be particularly defective in layout but all have potential for some improvements to enhance conspicuity and to warn drivers approaching the junction of its presence and the need to slow down. These measures, however, are indicated by the existing situation and not as a result of the proposed development. Although the development will add traffic to the network there is no reason to suppose that this will significantly compromise the safety of the existing road system.

5 Development Proposals

Development Proposals

5.1 Full details of the development proposals are outlined in Section 2 of this document.

Development Timescales

5.2 The timescales for development delivery are dependent on many factors, including the planning process and future market demand for housing. However, it is anticipated that the proposed development would commence onsite circa 2019. The development will be constructed over a number of years, potentially circa 10 years. Therefore the development is likely to be built in several phases with points of access delivered progressively, as necessary.

5.3 The phasing of the development is linked to the timings of the access strategy, which is discussed below.

Transport Strategy

5.4 To create a sustainable development it is fundamental that the TA considers how the future residents will access the development through all modes of transport. A sequential approach is to be followed, as detailed below:

- Encouraging environmental sustainability: Reducing the need to travel, especially by car
- Managing the existing network: Making best possible use of existing transport infrastructure
- Mitigating residual impacts: Initially through improvements to the local public transport network, and walking and cycling facilities, and then through provision of new or expanded roads

Development Phasing and Access Strategy

5.5 As the development will be progressed over some time, it will be necessary to phase infrastructure delivery to meet the requirements of the growing community. Phasing plans will be submitted during the course of the development. The development will be built in several phases, with points of access onto the existing highway network being delivered as necessary. The access drawing proposals are contained within the Appendix to the report.

5.6 The planning application is in outline with all matters reserved except for highway access. The detailed access drawings for which full planning permission is sought are included in Appendix D. Both have been subject to much discussion with SCDC and SCC, and are considered the most appropriate arrangements in terms of capacity, safety and aesthetics. These have been designed in accordance with the Manual for Streets to ensure that they are not overly engineered and have been subject to a Stage 1 Road Safety Audit.

5.7 Access to the site will be taken primarily from the A12 Dual Carriageway. The initial phase of the development will be served from A12 via the existing Newbourne Road Junction on the.

5.8 As the development quantum is increased, a further signal controlled junction on the A12 will be provided, north of the A12 / Newbourne Road junction.

5.9 As the development continues to be built out, a connection will be made to allow development traffic to use the existing Adastral Park Access Points to the north of the site off Gloster Road. A new road aligned through the NQ will facilitate this access into the site. This will be delivered during Year 6 of the operation of the development, and will be constructed across land that is currently under the ownership of BT, and will be released to the developer.

- 5.10 Through discussions with SCC, there is an aspiration to reduce the speed limit along the A12. This has potential benefits and will be supported by the Applicants for planning permission.

Internal Highway Network

- 5.11 Within the site, the Illustrative Framework Masterplan proposes a street network having a clear hierarchy. The Illustrative Framework Masterplan is indicative and will be confirmed through Reserved Matters. This is described below:

Primary route: A main streets through the development will connect to the external access points. The design speed for the internal street is based on a speed limit of 30mph, although the aspiration of the development is to achieve lower speeds through careful design of the streetscape and public realm.

The main links through the development will be designed to cater for public transport vehicles. It is not considered that any specific public transport priority measures will be required. The purpose of the main link is to distribute the traffic on to the secondary routes, keeping the main link free flowing. However, at the appropriate time, ahead of implementation, the design of the main link will be reviewed.

It is envisaged that pedestrian and cycle movements will be catered for through on and off carriageway provision.

Secondary Routes: Secondary routes are designed to penetrate the individual development blocks and cater for vehicles at the reduced speeds, which will be reflected in the design and appearance of these roads.

Tertiary Routes: These will be designed to penetrate individual housing clusters and will be designed to encourage lower vehicle speeds and could incorporate shared spaces between motor vehicles, pedestrians and cyclists. The aspiration is for design speeds of 20 MPH on tertiary and secondary routes, thereby affording priority to walking and on street cycle movements as well as enhancing the public realm.

Walking and Cycling Provision

- 5.12 Published good practice identifies five main requirements for pedestrian routes. Wherever possible these should be followed when planning for pedestrians within the proposed development:

- Convenience – follow desire lines without any undue deviation from route,
- Connectivity – link multiple origin and destinations,
- Conviviality – be pleasant to use,
- Coherence – be made legible through paving and/or signage,
- Conspicuousness – promote security and safety allowing pedestrians to see and be seen by others

- 5.13 The 'Guidance for Cycle Audit and Cycle Review' (The Institution of Highways and Transportation, 1998) determines five main requirements for cycle routes. It is highly crucial that these requirements are recognised if the promotion of cycling to the site as a viable and attractive alternative to car use is to be successful:

- Coherence: continuous and to a consistent standard,
- Directness: closely follow desire lines as much as possible,
- Attractiveness: in aesthetic as well as objective terms
- Safety: designed to minimise risks for cyclists and others; and
- Comfort: well maintained smooth dry surfaces, flush kerbs and gentle gradients

- 5.14 Overall consideration should be given towards the former Commission for Architecture and the Built Environment (CABE) principles of inclusive design, as highlighted below:
- Inclusive: so everyone can use it safely, easily and with dignity.
 - Responsive: taking account of what people say they need and want.
 - Flexible: so different people can use them in different ways.
 - Convenient: so everyone can use them without too much effort or separation.
 - Accommodating: for all people, regardless of their age, gender, mobility, ethnicity or circumstances.
 - Welcoming: with no disabling barriers that might exclude some people.
 - Realistic: offering more than one solution to help balance everyone's needs and recognising that one solution may not work for all
- 5.15 The Illustrative Framework Masterplan for the site will include numerous walking and cycling routes within the development to provide a comprehensive route network that will comprise both on and off road paths. This will include walking / cycling route adjacent to the main link road through the development. This would deliver the main spine through the development, from which spurs would then access the wider development. Highway crossing points will be designed to cater for all types of pedestrian users with the routes lit where appropriate.
- 5.16 Across the site the improvements would include the provision of adequate surfacing to reflect the characteristics of the area and lighting where appropriate. In areas adjacent to housing, this could result in illuminated tarmacked routes and in less built up areas more low engineered surfacing. The surfacing to be used will be appropriate to the type and quantum and usage for any given route.
- 5.17 The walking and cycling paths will connect the individual housing blocks into the main route through the site that will ensure full connectivity and route choice throughout the development.
- 5.18 As demonstrated in the attached drawings 10391-HL-101 and 10391-HL-102 in Appendix D, the onsite network will connect into the external walking and cycling network. The predominant walking and cycling desire lines is to be fully incorporated into the links from the development.
- 5.19 This demonstrates that two fully sustainable footway/cycleway/bridleway routes can be delivered that run from north to south across the development site that enable sustainable modes of transport as an alternative to the private car. These fully sustainable routes will connect into Ipswich Road at the south of the development and Martlesham at the north of the development, the latter allowing access to the nearby village of Martlesham via a well-connected network of already established cycleways and footways.
- 5.20 Walking and cycling trips to the west will be encouraged to travel through the development to make use of the high quality environs that will be delivered. The on-site routes will link into the A12 with suitable crossing facilities provided at the A12 site access point.
- 5.21 To the west, a pedestrian/cycle crossing is proposed across the A12 Dual Carriageway at the access point. The proposed cycle ways and footways will connect into the former alignment of the road that runs adjacent to the BT Adastral Park Complex, enabling connections via cycleway and footway to the footbridges across the A12 that connect into Martlesham Heath, Woodbridge and the eastern suburbs of Ipswich.

Road Based Public Transport Provision

- 5.22 To maximise the opportunities to travel by public transport, it is proposed to improve the current routes that operate in the immediate area. Brookbanks have discussed the public transport opportunities with local operators to ensure that a long term viable solution can be delivered

5.23 It is considered a phased delivery of public transport enhancements is appropriate to secure long term viability. Through discussions with Ipswich Buses, a public transport strategy has been developed, as indicated below.

Phase one: Initial diversion of existing Route 4 to provide peak and lunchtime facilities. There would be no cost associated with this initial diversion.

Phase two: Extension of Route 4 to operate throughout the day every 30 minutes. The estimated cost is identified as being £70,000 per annum, less revenue.

Phase three: Provision of a 20 minute frequency timetable with an extended route and operating day serving the development, and linked to route X5 via the full length of Foxhall Road to give a faster journey into town with potentially improved links to the train station. The estimated cost is identified as being £200,000 per annum, less revenue.

5.24 It is expected that the developer will offer these contributions for five years from the initial opening year of Phase 1 of the development or until the routes are self-funding.

5.25 The development will also consider the delivery of a dedicated shuttle bus service providing journey to key employment destinations and leisure / retail facilities for the new residents.

Offsite Interventions

5.26 Junction assessments have been completed to support the production of this Transportation Assessment, which supports and refines the requirements for off-site infrastructure interventions. These are identified below:

- **A14 / A12 / A1156 Interchange:** Circulatory Traffic Signals to be introduced on the A12 Approach Arm, the A14 Westbound Off-slip and the A1156 Felixstowe Road. Free-flowing Left-turn Lanes to be introduced from the A14 Westbound Off-slip into the A1156 Felixstowe Road and the A14 Eastbound Off-slip into the A12 Dual Carriageway. Bucklesham Lane Approach Arm to remain unchanged.
- **A12 / Newbourne Rd / Foxhall Road Roundabout:** Widening of existing roundabout to provide 3 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. A12 Northbound and Southbound approaches also to be signalised. Newbourne Road to be widened to two lanes with a two-lane flare on approach. Foxhall Road to be widened to two lanes with a two-lane flare on approach.
- **A12 / Barrack Square / Eagle Way Roundabout:** Widening of existing roundabout to accommodate 3 lane approaches for the A12 Northbound and Southbound over 80m length, which will also be signalised. Barrack Square to be widened to two lanes with three lane flare on approach. Two lane exit from roundabout with lane 1 for left turners for Gloster Road. Eagle Way Approach to remain unchanged.
- **A12 / Anson Road / Eagle Way Roundabout:** Widening of existing A12 Southbound Approach to accommodate 3 lanes over 80m length and signalised. Signalisation of A12 northbound approach. No alteration to Anson Road or Eagle Way approaches.
- **A12 / A1214 Roundabout:** Traffic – optimised signal timings.
- **Gloster Road / Barrack Square Priority Junction:** Capacity Widening of Bellmouth to provide a Left-turn Lane for Barrack Square into Gloster Road.

5.27 This represents a comprehensive package of interventions delivered through, and arising from, the development.

Parking Provision

5.28 On 25 March 2015 the Secretary of State for Communities and Local Government delivered the Planning update March 2015 to the House of Commons, on behalf of the Department for Communities and Local Government. He announced that national planning policy would be amended to further support the provision of car parking spaces. The following text

now needs to be read alongside paragraph 39 of the NPPF: “Local planning authorities should only impose local parking standards for residential and non-residential development where there is clear and compelling justification that it is necessary to manage their local road network.”

5.29 Paragraph 39 identifies that local planning authorities should take into account:

- Accessibility of the development
- The type, mix and use of development
- The availability of and opportunities for public transport
- Local car ownership levels
- An overall need to reduce the use of high-emission vehicles

5.30 SCC has produced standards for car parking. These are highlighted below.

Land use	Car Parking Standard	Cycle parking standard
B1 employment	1 per 30 sq.m. maximum	1 per 200 sq.m.
B2 employment	1 per 30 sq.m. maximum	1 per 300 sq.m.
B8 employment	1 per 400 sq.m. maximum	1 per 400 sq.m.
One bedroom residential unit	1 per dwelling minimum	2 secure covered space or provided by a garage
Two bedroom residential unit	1.5 per dwelling minimum when shared or two when provided on plot	2 secure covered space or provided by a garage
Three bedroom residential unit	2 per dwelling minimum	2 secure covered space or provided by a garage
Four + bedroom residential unit	3 per dwelling minimum	2 secure covered space or provided by a garage
Visitor / unoccupied residential parking	0.25 per dwelling minimum	Provided on plot
Primary school	Teaching staff: 1 space per teacher 15 pupils plus Visitors: 1 space per 20 pupils	1 stand per 5 staff plus 1 stand per 3 pupils

Figure 5a: SCC car parking standards

5.31 Further to para 5.8 above, the site access to the north from Gloster Road will be delivered through a newly aligned road to be taken through the NQ. The delivery of the new road alignment will result in a loss of parking spaces currently available to the BT site. We understand from BT that the area of car parking to be removed as a consequence of the northern quadrant road is not fundamental to the operation of the Adastral Park site. Adequate alternative parking is available elsewhere on the site. At the time of further application for the redevelopment of the NQ the applicants, together with BT, would anticipate undertaking a comprehensive rationalisation of car parking provision on the wider employment site.

6 Development Impact Appraisal

Impact Appraisal

6.1 The TA has considered the impact of new development using the principles set out in the New Approach to Appraisal (NATA). The impact of proposals are assessed in terms of the five NATA objectives for transport:

- Accessibility
- Safety

- Economy
- Environment
- Integration

Accessibility

- 6.2 The accessibility of the development is achieved through the successful forming of transport links from the development to the external transport routes such that a permeable layout is delivered that allows the future site occupiers to access the current range of local facilities and amenities by different modes of travel.
- 6.3 A qualitative review of the accessibility implications of the proposed development has been conducted. The existing level of access for cyclists and pedestrians between the proposed development and the surrounding transport system is described in Chapter 4.
- 6.4 A qualitative review of the accessibility implications of the proposed development has been conducted. In terms of local amenities, Figure 6a below, indicates the distances to local amenities from the development site with the distances recorded from the site boundary. The locations of the existing facilities and amenities are indicated in Figure 6b.
- 6.5 Journeys of less than 2km should be targeted for the promotion of walking as a suitable and sustainable mode of travel. The equivalent distance quoted for cycling is 5km. Distance contours are indicated in Figure 6c.

Amenity	Approx Distance from the Site (km)	Meet 2km Target Walk?	Approx Walk Time (mins)	Meet 5km Target Cycle?	Approx Cycle Time (mins)
Education					
Birchwood Primary School	850m	✓	11	✓	3
Gorseland Primary School	1.7	✓	21	✓	7
Kesgrave High School	4.0		48	✓	16
University of Suffolk	9.2		112		32
Health					
Orwell veterinary group-Kesgrave	1.9	✓	25	✓	8
Martlesham Health surgery	850m	✓	11	✓	4
Martlesham Pharmacy	850m	✓	11	✓	4
Martlesham Heath Dental Practice	900m	✓	12	✓	4
Tesco Opticians	1.0	✓	12	✓	4
Shops, Employment and Misc.					
Newsagent	850	✓	11	✓	3
Tesco Extra Supermarket	1.3	✓	13	✓	4
Martlesham Heath Post Office	1.0	✓	13	✓	4
Martlesham Leisure Club	400	✓	5	✓	2
Take away	110	✓	1	✓	1
Kesgrave Library	3.6	✓	45	✓	13

Figure 6a: Distance to Employment, Healthcare and Educational Destinations

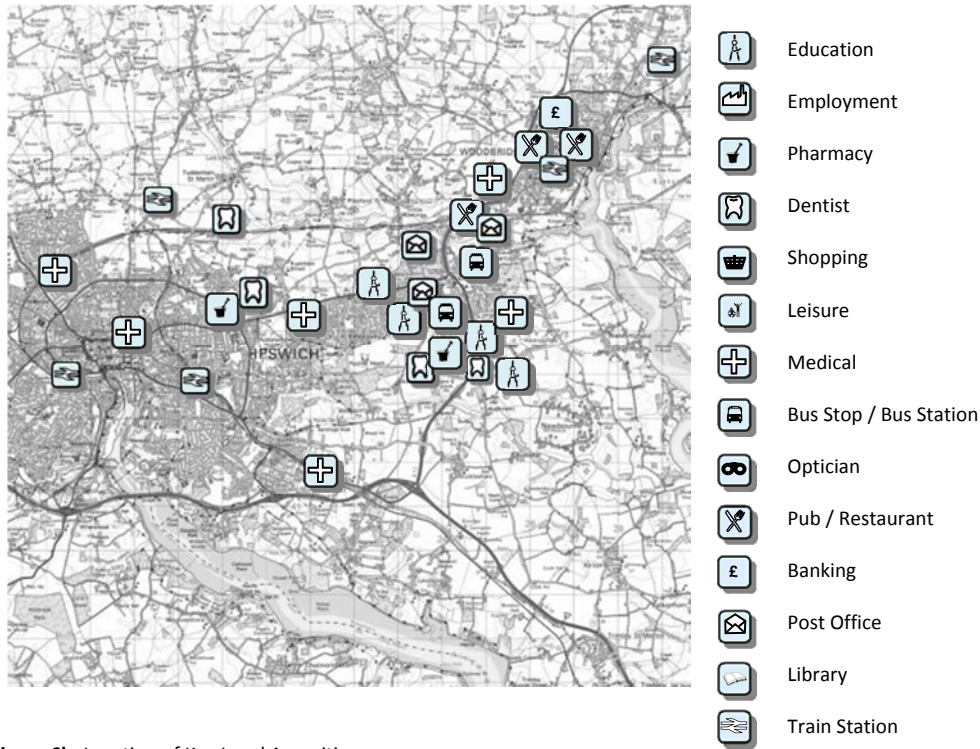


Figure 6b: Location of Key Local Amenities

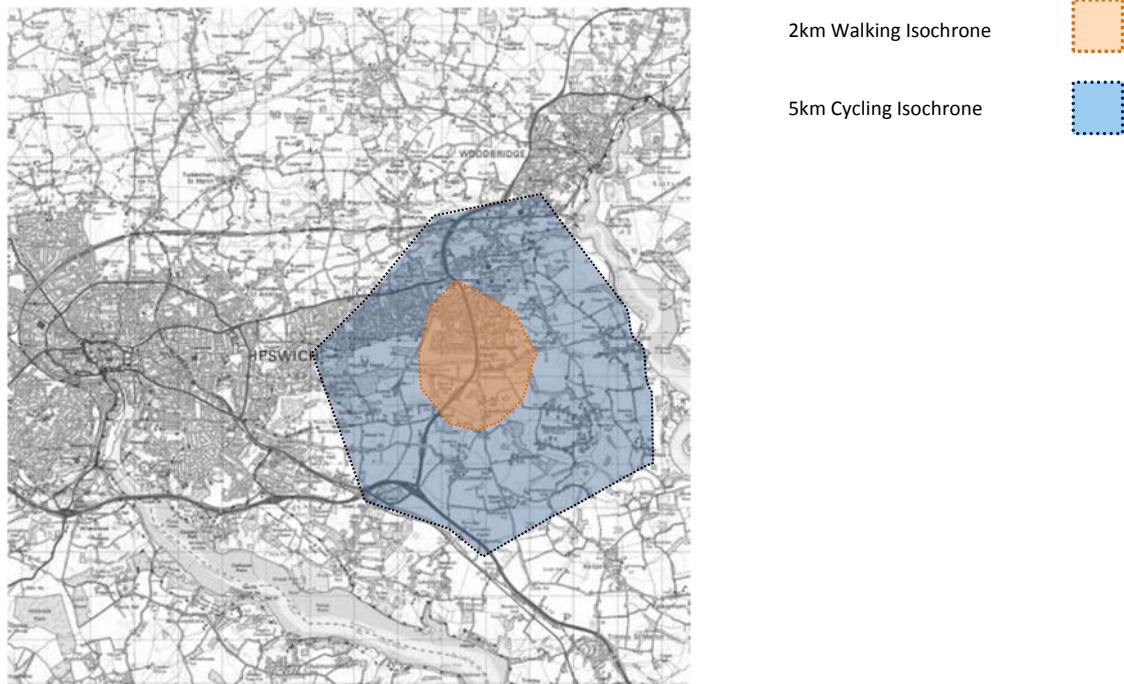


Figure 6c: Approximate walking and cycling distance contours

6.6 It may be concluded that the development will have very good accessibility to a wide range of local amenities that will support the new and existing community. Figure 6c provides a graphical representation of the 2km walking and 5km cycling isochrones, which the range of local amenities exist. The proposed development will not create any new accessibility barriers within the surrounding area. The range of facilities and services, including the provision made for education will also significantly improve as a result of the application proposals.

Safety

6.7 With new developments comes the potential for increased risk of accidents in the immediate area, due to increased multi-modal traffic. The safety of the development is therefore achieved firstly by identifying the existing accident records and making changes as necessary to the highway network to mitigate any problems. Thereafter, the proposals must be designed to appropriate standards with safety reviews being conducted as necessary during the process. In respect of these requirements:

- A review of the historical accidents has been completed that confirms there is no accident trend or risk that might materially be increased through the delivery of the development.
- The proposals have been developed in line with recognised standards in the form of the Design Manual for Roads and Bridges and Manual for Streets. Stage One Road Safety Audits have been completed with regards to the site accesses to ensure compliance with the relevant applied design standards.

Economy

6.8 The transport economic efficiency of the development is achieved in part through the successful delivery of a comprehensive transport access strategy that considers all modes of transport, to ensure journey reliability.

6.9 A key transport objective is to minimise any significant adverse impact on journey times, reliability and travel costs, and to maintain or reduce public transport and non-motorised journey times.

6.10 This has been achieved through modelling the highway network and ensuring appropriate improvements can be made to ensure that significant additional congestion as a result of the proposed development is unlikely to occur.

6.11 The assessment of trip generation and its likely impact on the local road network, and the latter through a considered choice of mitigating measures; both will be discussed in a later section of this Transport Assessment.

6.12 It should be noted that the proposed development will deliver high quality housing in an area of Ipswich that will increase the work force to maximise employment opportunities.

Environment

6.13 The transport environmental benefits of the development are achieved in part through the delivery of a sustainable transport strategy that encourages travel by walking, cycling and public transport and reduces the reliance of the single occupancy vehicle trip.

6.14 As a result of the development proposals, local traffic generally increases and appropriate mitigation may be implemented to accommodate this effect. Later Chapters in this report highlight that in this case no such mitigation is required. No significant issues are apparent in relation to the environmental issues.

Integration

6.15 Integration of the development into the community is achieved in part through the successful forming of travel links and through the availability of services and the like. It is important that integration is achieved to deliver a 'healthy new community'.

6.16 A sustainable residential travel plan will contribute towards the ease of interaction between different modes of transport for residents within the development. A Travel Plan is attached and discussed further in Chapter 7.

- 6.17 The development proposal is in line with transport planning policy. The Transport Assessment underlines areas in which the proposal supports local, regional and national planning transport policies as detailed in Chapter 3.
- 6.18 There will be no exacerbation of social exclusion resulting from the residential development since no existing travel movements will be cut off or hampered.

Summary of Site Accessibility

- 6.19 This section of the TA demonstrates that the proposed development site has a wide range of locational advantages in terms of site accessibility.
- 6.20 The site is in close proximity to Adastral Park, which provides a range of amenities to serve daily needs both in relation to food retail, education, healthcare and employment. The development will reinforce these services as necessary with the provision of local centres containing retail, employment opportunities and a healthcare facility, and two primary schools.
- 6.21 The development site will have excellent walking and cycling links into Adastral Park. Future residents will be readily able to access both road and bus networks.

7 Travel Plan

Travel Plan Overview

- 7.1 The transport paradigm is one of facilitating mobility. It's about masterplanning and creating communities and no longer about prioritising the convenience of car commuters. People live in and around cities because of the opportunities within short distances. The key element is accessibility. The aim is to maximise densities, public realm and accessible facilities by best use of the highest capacity transport networks.
- 7.2 There is an expectation borne out of emerging evidence that travel habits will continue to evolve so that a greater proportion of people will be travelling less, and using more socially inclusive mobility methods, such as walking, cycling, car sharing and public transport. Maintaining a convenient car driver network relies on more people making other choices.
- 7.3 The development will focus on mobility, which is access to day to day and other facilities by a wide choice of easy methods for a wide sector of society, so that social inclusion is maximised. The approach to sustainable mobility is to adopt a general hierarchy for travel choice in this order:
1. Local Living
 2. Virtual Mobility
 3. Active Travel
 4. Shared Travel
 5. Single Occupancy Travel
- 7.4 Good design and masterplanning is the fundamental structure for this transport approach. The objective is to build the community at a pedestrian scale, with easy permeability by high capacity networks (walking and cycling), linking to day to day facilities.
- 7.5 Designing in this way encourages interaction at a human scale, with attractive walking and cycling networks carrying a substantial proportion of movement.

- 7.6 The approach being adopted for the site follows the modern transport principles of:
- Design (in terms of designing for local living at a pedestrian scale)
 - Choice (in terms of providing alternatives for travel)
 - Behaviour (influencing behaviour)
 - Management (managing the transport networks, for instance holding queues in the most appropriate places)
- 7.7 The development will be designed with local living in mind with the provision of a plethora of community facilities including a primary school, secondary school, local shops, healthcare service, leisure and jobs. This has the ability to contain movement within the locality of the site and the adjacent Astral Park, helping to internalise movement and minimising demands on the wider transport networks. This has benefits for the surrounding communities which will also benefit from these facilities and initiatives.
- 7.8 In addition to the design of the site, and the day to day facilities provided as part of the scheme, the development will commit to:
- Active travel corridors
 - A Community Concierge (CC), situated in a shop front location at the heart of the development, that will provide personal mobility services to residents, businesses and schools within the local area, and not restricted to just the development itself. These services will include bespoke travel advice, bike repair, promotion of car sharing schemes, organised walks and rides, specific travel planning organisation for schools, including walking buses, cycle trains and scoot to school, liaison with transport operators, bike or electric bike hire, a drop off point for internet deliveries, and more.
 - A Micro Consolidation Centre (MCC) which in its simplest form is the MCC taking receipt of home deliveries, and arranging for their onward delivery by simple and sustainable means. This provides significant efficiency relating to the last mile of travel.
 - Access to high speed broadband both at home and in communal work hubs. This will encourage more community based working and less demand and reliance on the wider transport network
 - A Communal Work Hub that provides work space, meeting areas and support facilities to enable home or community working, reducing commuter travel and fostering a local business community atmosphere
 - Public transport and active travel priority.
 - Active management and monitoring of transport systems using the next generation computer vision and machine learning information and behaviour gathering devices

Travel Plan Benefits

- 7.9 A Travel Plan (TP) is a management tool designed to enable the users of any site to make more informed decisions about their travel while minimising the adverse impacts of the development on the environment. This is achieved by setting out a strategy for eliminating the barriers keeping users of the site from using sustainable modes and managing single-occupancy car use.
- 7.10 This Transport Assessment is accompanied by a Framework Travel Plan (FTP). The Transport Assessment should be read in conjunction with the FTP to fully understand the overall transport strategy for the site. The FTP has formed the basis for the sustainable transport strategy and FTP for the proposed development. The FTP will establish the overarching principles to be applied to ensure that the final TP will maximise modal shift.
- 7.11 If well-designed and properly managed, the implementation of a Travel Plan can lead to a decrease in the proportion of site users using private cars and an increase in the proportion using sustainable modes of public transport, including walking and cycling.
- 7.12 Travel Plans can also:

- Improve the environmental credentials of the proposed development
- Reduce the traffic impact on the local highway network
- Improve the health and well-being of all the site occupiers
- Reduce adverse impacts on local residents and businesses

Travel Plan Objectives

7.13 The Travel Plan for the development has several key objectives, as listed below:

- Reduction in the car based trips
- Reduction of Single Occupancy Vehicle (SOV)
- Reduction in congestion and pollution through reduced car use
- Improve the modal split of trips made by walking
- Improve the modal split of trips made by cycling
- Improve the modal split of trips made by public transport

Travel Plan Targets

7.14 The TP will need to establish mode share targets. These targets should be based on challenging, but achievable non-car and Single Occupancy Vehicle (SOV) mode share targets. The targets should be based upon current practice in the hinterland around, and the location of, the site. The target will take account of the local geography and existing transport provision.

7.15 Based on the census information, the nature of the development and the expected travel characteristics, the target for the site will be to reduce the SOV by an ambitious 15% modal shift.

Travel Plan Coordinator / Community Concierge

7.16 Research has shown that Travel Plans need to be managed by a Travel Plan Coordinator, who has a clear brief with dedicated resources to manage the Plan to ensure that its objectives are met.

7.17 The key responsibilities undertaken by the Coordinator as set out below will be reviewed and amended on a regular basis:

- Leading on the delivery of the TP once approved
- Coordinating the necessary data collection required to develop the 'Household Travel Pack' and 'Employee Travel Packs'
- Representing the 'human face' of the TP including liaison with residents' steering group or management committee
- Promoting the individual measures and packages
- Liaising with the relevant Council Public Transport Team
- Liaising with the Local Highway Authority over monitoring and reviews of the TP
- Assessing progress towards achieving mode-shift away from car use

7.18 The community concierge will be tasked with understanding and promoting the initiatives that will support and encourage socially inclusive mobility, and influencing travel towards the more sustainable and efficient methods. The community concierge would form part of the Travel Plan for the Development and be managed through the Travel Plan Coordinators. The provision of the community concierge would form a key part of the Travel Plan and its implementation.

7.19 The responsibilities will include:

- Providing general and bespoke travel planning to the community;
- Establishing a 'shop front' mobility advice service and presence within the heart of the development;
- Undertaking or advising on basic cycle maintenance;
- Promoting residential car sharing schemes, and working with the employment centres on their car sharing schemes
- Working with travel planning officers and other travel planning teams in the area;
- Receiving and holding deliveries for local people;
- Liaising with the local schools over travel planning. This will include advice and assistance with various school travel initiatives such as Scoot to School, Walking Buses, Cycle Trains;
- Organising local walks and cycle rides;
- Monitoring the quality of local active travel and other routes and services and liaising with the council officers and transport service providers.

Travel Plan Measures

- 7.20 The key to a successful TP is identifying the correct measures that will suit the future residents. It is unlikely that there will be sufficient attraction to a single measure and hence a combination of measures is the most appropriate approach to take.
- 7.21 In order to maximise the uptake of sustainable transport measures of the development, sustainable transport modes will be available and will be promoted during all stages of the development process from the design, construction and initial marketing of the development through to initial occupation and then on to full occupation of the site.
- 7.22 The key stages of the Travel Plan process integrate with the key stages of the development process as set out below:
- Before occupation of any dwellings - pre occupation
 - During the period when dwellings are being occupied – during occupation
 - After dwellings have been occupied – post occupation

8 Development Traffic Generation

Introduction

- 8.1 In the context of development proposals, the primary objective of transport network modelling is to provide the tool to assess the effects of additional traffic and growth on the transport network and help inform the need for interventions to ensure the network operates satisfactorily into the future.
- 8.2 To assess the potential impacts of development, two methodologies are typically used. These are described below.

Formal Traffic model: A tool for analysing the performance of road networks based on a set of mathematical algorithms that evaluate the movement of vehicles over a set time period. The model is a simplified representation of real time traffic conditions. To ensure these reflect traffic conditions accurately, the outputs from the model are calibrated and validated based on traffic count data. Once a base model has been set up, the traffic flows are projected forward to assess how the network will operate in the future. These models are computer simulations using software like Paramics, VISSIM or Saturn and can be expensive to establish.

Traditional Method of Traffic Generation: In the absence of a formal traffic model, a manual method to assess development impacts can be used. This typically uses classified traffic counts at key locations as the basis for junction assessments. The observed traffic flows are then factored to the agreed assessment years, together with the inclusion of the development traffic flows which are generated by using trip rates from TRICS, distributed by Census travel statistics.

8.3 Through discussions with SCC, it has been agreed that a bespoke Paramics model is the most suitable to assess the implications of this development. Further details are provided in Appendix A with brief details provided in the following sections. Following the production of the Paramics model, this was subject to a detailed review by the SCC modelling consultants, WSP. Following very detailed and extensive dialogue, the structure of the Paramics model has been agreed.

Study Area

8.4 The agreed study area of the Paramics model is indicated below.

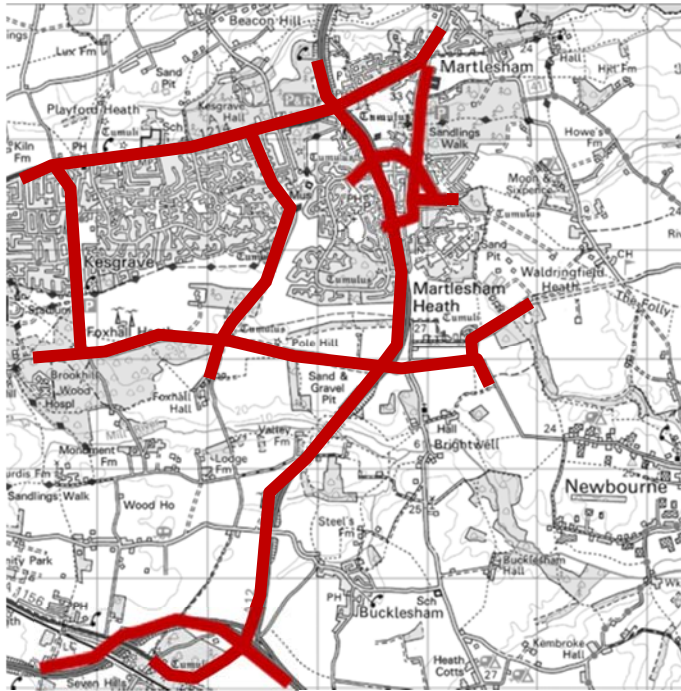


Figure 8a: Paramics Study Area

8.5 In addition to the Paramics scope, the Copdock interchange and other offsite junctions were identified to be assessed.

Base Line Traffic Conditions

8.6 The base line traffic conditions were recorded through a package of traffic counts which incorporated:

- Classified Turn Counts
- Automatic Traffic Counts
- Queue length surveys carried out on the same day as the corresponding turn count surveys
- Journey time surveys are to be requested across the AM and PM peak periods

8.7 The turn counts, Queue and Journey time surveys covered the AM and PM peak periods of 07:00 to 10:00 and 16:00 to 19:00.

8.8 The ATCs captured a week long period and cover the full 24 hours in each day.

8.9 Turn counts were collected using mobile CCTV / video surveys and time and date stamped. Turn count data was presented at a minimum of 15 minutes intervals across the stipulated period (i.e. 07:00 to 10:00 & 16:00 to 19:00). Turn count data was classified as Car, LGV, OGV1, OGV2 and PSV.

- 8.10 Queue lengths were collected either manually or using video surveys at the same time as the turn count surveys. The method selected should ensure the maximum length of the queue can be noted. On each approach the maximum queue length in vehicle numbers recorded during each 5 minutes interval across the collection period (i.e. 07:00-10:00 and 16:00-19:00) was recorded.
- 8.11 Journey time surveys were collected and recorded in both directions of the defined routes. Along each route, a number of timing points have been identified as to which the exact time crossing each point is required. The journey times were recorded between 07:00-10:00 and 16:00-19:00

Future Year Scenarios

- 8.12 Following the completion of the base line scenario, this scenario was factored through Temprow growth predictions. This produced the future year traffic flows without development.
- 8.13 Following agreement with SCC, the future year with development scenario included the Adastral Park development, the additional LP sites and the two sites outside of the LP.

Trip Rates

- 8.14 The trip base trip rates have been extracted from TRICS. The final trip rates have been discussed in detail with SCC. This has resulted in an agreed position. The agreed trip rates are presented below. These trip rates were continually discussed with SCC and the information presented below supersedes information contained in the Scoping Note.

Time Periods	Private Housing - original		Affordable Housing - original		Primary School - revised		Employment - original	
	IN	OUT	In	Out	In	Out	In	Out
0700-0800	0.077	0.276	0.064	0.179	0.022	0.002	0.589	0.129
0800-0900	0.149	0.394	0.127	0.235	0.288	0.227	1.481	0.264
0900-1000	0.150	0.187	0.089	0.110	0.026	0.045	0.694	0.208
1600-1700	0.297	0.180	0.202	0.146	0.041	0.048	0.248	0.794
1700-1800	0.350	0.201	0.258	0.185	0.024	0.032	0.182	1.178
1800-1900	0.254	0.186	0.158	0.112	0.002	0.006	0.116	0.455

Figure 8b: Vehicle trip rates

- 8.15 The Suffolk Coastal Local Plan confirms that through Development Management Policy DM2 Affordable Housing on Residential Sites, one in three houses should be affordable. It is considered that a sensitivity test on 100% open market is not justified as this scenario would not be permitted. The development will deliver a percentage of affordable housing. To ensure a robust assessment, it has been assumed that 20% (one in five) of the housing stock will be affordable. The resultant housing trip rates (combining 20% affordable housing and 80% private housing) are identified below.

Time Periods	Housing (Private and Affordable Combined)	
	IN	OUT
0700-0800	0.074	0.257
0800-0900	0.145	0.362
0900-1000	0.138	0.172
1600-1700	0.278	0.173
1700-1800	0.332	0.198
1800-1900	0.235	0.171

Figure 8c: Resultant housing vehicle trip rates

8.16 Subsequently to the trip rates agreed by SCC, the additional trip rates for secondary school and sixth form places are highlighted below.

Time Periods	Secondary School		Sixth form	
	IN	OUT	IN	OUT
0700-0800	0.045	0.011	0.016	0.004
0800-0900	0.148	0.093	0.082	0.022
0900-1000	0.021	0.017	0.042	0.016
1600-1700	0.022	0.053	0.021	0.053
1700-1800	0.017	0.027	0.022	0.032
1800-1900	0.014	0.02	0.026	0.017

Figure 8d: Secondary school vehicle trip rates

8.17 The resultant trip rates used in the assessment are presented below.

Time Periods	Housing		Secondary School		Primary School		Employment		Sixth form	
	IN	OUT	In	Out	In	Out	In	Out	IN	OUT
0700-0800	0.074	0.257	0.045	0.011	0.022	0.002	0.589	0.129	0.016	0.004
0800-0900	0.145	0.362	0.148	0.093	0.288	0.227	1.481	0.264	0.082	0.022
0900-1000	0.138	0.172	0.021	0.017	0.026	0.045	0.694	0.208	0.042	0.016
1600-1700	0.278	0.173	0.022	0.053	0.041	0.048	0.248	0.794	0.021	0.053
1700-1800	0.332	0.198	0.017	0.027	0.024	0.032	0.182	1.178	0.022	0.032
1800-1900	0.235	0.171	0.014	0.02	0.002	0.006	0.116	0.455	0.026	0.017

Figure 8e: Vehicle trip rates

Trip Rate Sensitivity Test

8.18 In reaching the agreement with SCC, it was agreed the existing peak hour trip rate generated by the existing residential area of the west of the A12 was assessed to determine the equivalent trip rate. This is presented below.

Time Periods	Housing – Existing Area		Housing trip rate – taken from TN06	
	IN	OUT	In	Out
0800-0900	0.188	0.275	0.145	0.362
1700-1800	0.242	0.197	0.322	0.198

Figure 8f: Comparison of residential trip rates

8.19 This comparison demonstrates that the trip rates used in this assessment are robust.

Total Trip Generation Excluding Internalisation

8.20 Based on the following development mix the resultant total trips expected to be generated by the development is indicated in Figure 8g.

- 2000 homes (80 / 20 split between open market and affordable)
- 3 FE Primary in total (30 pupils per year over 7 years = 630 pupils)
- 3 FE secondary forming an all through school (30 pupils per year over 7 years = 600 pupils)
- Sixth form (200 pupils)
- 2,000 sqm of employment (GFA equivalent to the 0.6ha to be delivered)

Time Periods	Housing		Secondary School		Primary School		Employment		Sixth form	
	IN	OUT	IN	OUT	In	Out	In	Out	In	Out
0700-0800	148	514	28	7	14	1	12	3	3	1
0800-0900	290	724	89	56	181	143	30	5	16	4
0900-1000	276	344	13	11	16	28	14	4	8	3
1600-1700	556	346	14	33	26	30	5	16	4	11
1700-1800	664	396	11	17	15	20	4	24	4	6
1800-1900	470	342	9	13	1	4	2	9	5	3

Figure 8g: Total vehicle trips

8.21 **Total Trip Generation Including Internalisation**

8.22 As indicated, the development will deliver a range of complimentary land uses on site. It is likely that a significant proportion of the generated trips from the individual land uses will be linked to a secondary journey purpose. To avoid double counting these trips and to present realistic trip generation, the individual trips from each land use has been assessed. This is described in the following sections.

8.23 **Primary School Internalisation:** The development will deliver primary school places. At the time of writing, it is considered that sufficient school places will be delivered to respond to the expected demand. The 2011 census statistic for the Martlesham Ward has been reviewed. This indicates that there are 317 primary school age children generated from 2198 households. This equates to 0.14 children per household. The development could deliver 2000 houses, resulting in 288 primary school age children generated by the development. The development could generate a demand for 630 places. The total of internal / external trips provided by the primary places is indicated below. This results in a number of external trips that will take account of staff trips as well.

Time Periods	Internal education trips		External education trips	
	IN	OUT	IN	OUT
0700-0800	6	1	8	1
0800-0900	83	65	98	78
0900-1000	7	13	9	15
1600-1700	12	14	14	16
1700-1800	7	9	8	11
1800-1900	1	2	1	2

Figure 8h: Internal / external primary education trips

8.24 **Secondary School Internalisation:** The development will also deliver secondary school places, including six form provision. As per the agreed methodology for the primary school, the 2011 census statistic for the Martlesham Ward has been reviewed. This indicates that there are 426 secondary school age children generated from 2198 households. This equates to 0.19 children per household. The development could deliver 2000 houses, resulting in 388 secondary school age children generated by the development. The development could generate a demand for 600 places. The total of internal / external trips provided by the secondary places is indicated below. This results in a number of external trips that will take account of staff trips as well.

Time Periods	Internal education trips		External education trips	
	IN	OUT	IN	OUT
0700-0800	13	3	14	3
0800-0900	43	27	46	29
0900-1000	6	5	6	5
1600-1700	6	15	7	16
1700-1800	5	8	5	8
1800-1900	4	6	4	6

Figure 8h: Internal / external secondary education trips

8.25 **Sixth Form Internalisation:** The development will also deliver a sixth form provision. As per the agreed methodology for the primary school, the 2011 census statistic for the Martlesham Ward has been reviewed. This indicates that there are 106 sixth form school age children generated from 2198 households. This equates to 0.048 children per household. The development could deliver 2000 houses, resulting in 96 sixth form age children generated by the development. The total of internal / external trips provided by the secondary places is indicated below. This results in a number of external trips that will take account of staff trips as well.

Time Periods	Internal education trips		External education trips	
	IN	OUT	IN	OUT
0700-0800	2	0	2	0
0800-0900	8	2	8	2
0900-1000	4	2	4	2
1600-1700	2	5	2	5
1700-1800	2	3	2	3
1800-1900	3	2	3	2

Figure 8i: Internal / external sixth form education trips

8.26 **Housing Internalisation:** To identify the numbers of trips that are likely to remain within the development, a review of the distances people travel to work has been reviewed based on Census statistics. This indicates that 29.7% residents from the Martlesham Ward travel less than 5km to work. As well as the jobs being created by the development, the wider Adastral Park provides significant employment opportunities. Therefore, it is considered reasonable to include an allowance of 30% of housing trips to be internal. Furthermore, as well employment trips, there will be additional trips generated by the housing that will remain internal, not least the trips linked to the education provision. On this basis, the resultant trip generation is provided below.

Time Periods	Internal housing trips		External housing trips	
	IN	OUT	IN	OUT
0700-0800	46	166	103	348
0800-0900	89	236	200	488
0900-1000	90	112	186	231
1600-1700	178	108	378	238
1700-1800	210	121	453	275
1800-1900	152	112	317	231

Figure 8j: Internal / external housing trips

8.27 **Employment Internalisation:** It is considered reasonable to also include a similar allowance of 30% for employment trips to be internal.

Time Periods	Internal employment trips		External employment trips	
	IN	OUT	IN	OUT
0700-0800	4	1	8	2
0800-0900	9	2	21	4
0900-1000	4	1	10	3
1600-1700	1	5	3	11
1700-1800	1	7	3	16
1800-1900	1	3	2	6

Figure 8k: Internal / external employment trips

Summary of External Trips

8.28 The external trips identified above are summarised below.

Time Periods	Housing		Secondary School		Primary School		Employment		Sixth form	
	IN	OUT	IN	OUT	In	Out	IN	OUT	In	Out
0700-0800	103	348	14	3	8	1	8	2	2	0
0800-0900	200	488	46	29	98	78	21	4	8	2
0900-1000	186	231	6	5	9	15	10	3	4	2
1600-1700	378	238	7	16	14	16	3	11	2	5
1700-1800	453	275	5	8	8	11	3	16	2	3
1800-1900	317	231	4	6	1	2	2	6	3	2

Figure 8l: Total external vehicle trips per land use

8.29 The total external trips is indicated below.

Time Periods	Total	
	IN	OUT
0700-0800	135	354
0800-0900	373	601
0900-1000	215	256
1600-1700	404	286
1700-1800	471	313
1800-1900	327	247

Figure 8m: Total external vehicle trips

Sustainable Trips

8.30 As indicated by Chapter 7, the delivery of the development will be supported by a travel plan that will achieve a 15% mode shift away from the single occupancy trip. Therefore, this has been taken into account in relation to the total external trips that is likely to be generated by the development, as indicated below.

Time Periods	Total	
	In	Out
0700-0800	114	301
0800-0900	317	510
0900-1000	183	218
1600-1700	344	245
1700-1800	401	267
1800-1900	278	210

Figure 8n Total external vehicle trips

Northern Quadrant

8.31 The above protocol has been followed to determine the additional trips generated on the NQ, should this brought forward at a later date. It is emphasised that this employment development does not form part of the present planning application.

Time Periods	Total	
	In	Out
0700-0800	46	10
0800-0900	115	20
0900-1000	54	16
1600-1700	19	61
1700-1800	14	91
1800-1900	9	35

Figure 8m: Northern Quadrant external vehicle trips

Highway Mitigation Strategy

8.32 The final mitigation strategy is identified below.

- **A14 / A12 / A1156 Interchange:** Circulatory Traffic Signals to be introduced on the A12 Approach Arm, the A14 Westbound Off-slip and the A1156 Felixstowe Road. Free-flowing Left-turn Lanes to be introduced from the A14 Westbound Off-slip into the A1156 Felixstowe Road and the A14 Eastbound Off-slip into the A12 Dual Carriageway. Bucklesham Lane Approach Arm to remain unchanged.
- **A12 / Newbourne Rd / Foxhall Road Roundabout:** Widening of existing roundabout to provide 3 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. A12 Northbound and Southbound approaches also to be signalised. Newbourne Road to be widened to two lanes with a two-lane flare on approach. Foxhall Road to be widened to two lanes with a two-lane flare on approach.
- **A12 / Barrack Square / Eagle Way Roundabout:** Widening of existing roundabout to accommodate 3 lane approaches for the A12 Northbound and Southbound over 80m length, which will also be signalised. Barrack Square to be widened to two lanes with three lane flare on approach. Two lane exit from roundabout with lane 1 for left turners for Gloster Road. Eagle Way Approach to remain unchanged.
- **A12 / Anson Road / Eagle Way Roundabout:** Widening of existing A12 Southbound Approach to accommodate 3 lanes over 80m length and signalised. Signalisation of A12 northbound approach. No alteration to Anson Road or Eagle Way approaches.
- **A12 / A1214 Roundabout:** Traffic – optimised signal timings.
- **Gloster Road / Barrack Square Priority Junction:** Capacity Widening of Bellmouth to provide a Left-turn Lane for Barrack Square into Gloster Road.

8.33 Road Safety Audits at Stage 1 for all the junctions that require physical mitigation have now been undertaken and the Designer's Responses are attached in Appendix F.

Traffic Scenarios

8.34 The validated and calibrated Paramics model has established the following traffic scenarios:

- **Scenario 1:** Base 2016, reflecting the base current operation of the road network
- **Scenario 2:** Reference Case 2027 reflecting the expected future operation of the road network without development
- **Scenario 3:** Do-Something 2027 reflecting the future year test plus the Adastral Park development, with mitigation
- **Scenario 4:** Do-Something 2027 reflecting the future year test plus the Adastral Park development, with mitigation together with the NQ

Paramics Output

8.35 Paramics provides numerous outputs in order to assess the operation of the network, this includes:

- **Network Statistics:** These provide information on the model as a whole
- **Journey Times:** Provides an indication of the change in journey times on key links
- **Link Flow Analysis:** Providing results on both link speed and traffic volumes
- **Junction Queuing:** Identifies the level of queuing at junctions

8.36 In order to assess the likely impact of the development, consideration needs to be made towards all the outputs, and not concentrate on each as individual.

9 Road Network Review – Network Statistics

Introduction

9.1 A number of statistics can be extracted from the modelling results that assess the model as a whole, therefore representing a high level review of the operation of the complete model. This information is to provide the following comparative statistics:

- **Network mean delay (s):** The average mean delay during the model simulation period.
- **Average Speed (Km/h):** The average speed travelled by all vehicles that completed a journey during the model simulation period.

9.2 The two measurements are averages so can be used to compare between the various scenarios.

Network Mean Delay

9.3 The result for the mean delay over is presented below.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Morning Peak (08:00 to 09:00)	284	481	367	367
Evening Peak (17:00 to 18:00)	333	558	298	299

Figure 9a: Network Mean Delay (s) – peak hour

9.4 The results indicate that delay over the network increases from Scenario 1 to Scenario 2. This is expected as traffic levels increase through background growth. Following the introduction of the development together with the identified mitigation, the delay is predicted to decrease significantly, demonstrating that the identified mitigation delivers better than nil-detriment.

9.5 The inclusion of the NQ has a negligible impact on the results.

9.6 This demonstrates that the road network will not be affected following the delivery of the development.

Average Speeds

9.7 The result for the average speeds is presented below.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Morning Peak (08:00 to 09:00)	51	30	41	40
Evening Peak (17:00 to 18:00)	42	25	48	48

Figure 9b: Average Speeds in kph

9.8 The analysis of the average speeds indicates that the addition of development traffic to the network results in vehicle speeds increasing by 12kph following the introduction of the mitigation strategy, but with vehicle speeds which are faster when judged against the Reference case (Scenario 2).

9.9 The inclusion of the NQ has a negligible impact on the results.

9.10 This demonstrates that the road network will not be negatively affected following the delivery of the development, with the mitigation strategy offering better than nil-detriment.

Interpretation of Results

9.11 The information above presents the results for the network wide statistics in the assessment of the Adastral Park development. The findings are summarised below:

Mean Delay

- Following mitigation, the mean delay decreases

Average Speeds

- Following mitigation, the average speed increases

Results Summary

- 9.12 This chapter has reviewed the network wide statistics generated by Paramics, which provide a high level overview of the operation of the wider road network. This has indicated that through the introduction of the identified highway interventions, there is a betterment in both the morning and evening peaks.
- 9.13 Based on the results of the network statistics, from a highway stand point, the residential element will not have a beneficial impact on the highway network and therefore the development should be supported.

10 Road Network Review – Journey Times

Introduction

- 10.1 Outputs from the Paramics model includes an estimation of journey times across key routes on the network. The impact on average journey times can be compared between the assessed traffic scenarios. The routes that are applicable to this development are indicated below:

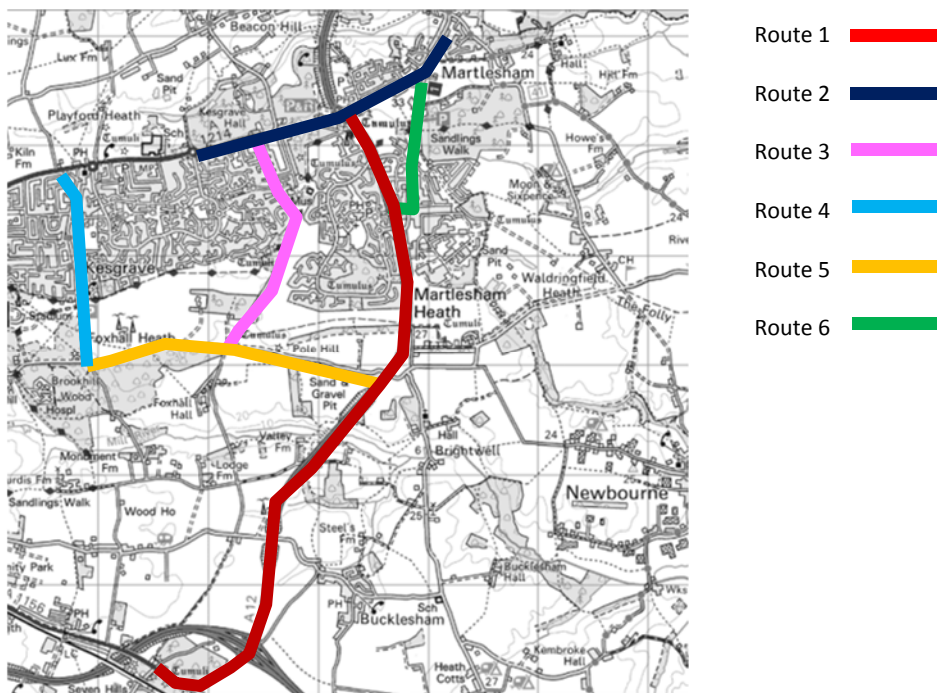


Figure 10a: Journey time routes

- Route 1 – A12 between A1214 and the A14
- Route 2 – The A1214 / Main Street between Ropes Drive and Felixstowe Road
- Route 3 – Dobbs Lane between A1214 and Foxhall Road
- Route 4 – Bell Lane between A1214 and Foxhall Road
- Route 5 – Foxhall Road between Bell Lane and A12
- Route 6 – Felixstowe Road / Gloster Road between Main Street and A12

- 10.2 The results of the journey time is presented below.

Route			Scenario 1		Scenario 2		Scenario 3		Scenario 4	
			8:00-9:00	17:00-18:00	8:00-9:00	17:00-18:00	8:00-9:00	17:00-18:00	8:00-9:00	17:00-18:00
1	A12 between A1214 and the A14	Northbound	341	373	536	842	388	322	406	324
		Southbound	365	494	491	880	509	426	517	454
2	The A1214 / Main Street between Ropes Drive and Felixstowe Road	Eastbound	350	259	589	284	344	274	348	277
		Westbound	245	256	295	292	251	267	251	268
3	Dobbs Lane between A1214 and Foxhall Road	Southbound	146	149	152	158	156	185	155	177
		Northbound	144	147	210	149	147	150	146	149
4	Bell Lane between A1214 and Foxhall Road	Southbound	126	134	136	155	132	169	134	167
		Northbound	212	154	251	195	152	146	152	145
5	Foxhall Road between Bell Lane and A12	Eastbound	230	115	475	116	184	124	185	124
		Westbound	116	118	118	121	109	126	108	127
6	Felixstowe Road / Gloster Road between Main Street and A12	Southbound	151	207	139	2797	141	143	142	144
		Northbound	185	179	141	141	149	152	147	149

Figure 10b: Journey time routes

10.3 The difference in flows has been assessed against the following criteria.

Rating	Score
Delay reduction	Green
No significant change with a difference of less 15%	Light Green
Minor increase with a difference between 15% and 25%	Yellow
Moderate Increase with a difference between 25% and 50%	Red
Major Increase with a difference greater than 50%	Dark Red

Figure 10c: Impact assessment

Route			Scenario 2 Vs Scenario 3		Scenario 2 Vs Scenario 4	
			AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1	A12 between A1214 and the A14	Northbound	-28%	-62%	-24%	-61%
		Southbound	4%	-52%	5%	-48%
2	The A1214 / Main Street between Ropes Drive and Felixstowe Road	Eastbound	-42%	-4%	-41%	-2%
		Westbound	-15%	-9%	-15%	-8%
3	Dobbs Lane between A1214 and Foxhall Road	Northbound	2%	17%	2%	12%
		Southbound	-30%	1%	-30%	1%
4	Bell Lane between A1214 and Foxhall Road	Northbound	-3%	9%	-1%	8%
		Southbound	-40%	-25%	-40%	-26%
5	Foxhall Road between Bell Lane and A12	Eastbound	-61%	7%	-61%	7%
		Westbound	-7%	4%	-8%	5%
6	Felixstowe Road / Gloster Road between Main Street and A12	Southbound	1%	-95%	2%	-95%
		Northbound	6%	8%	4%	6%

Figure 10d: Routes with change

Scenario 2 Vs Scenario 3

10.4 This compares the delivery of the development, including mitigation against the Reference Case. This identifies that following the introduction of the mitigation, the majority of the routes experience a reduction in journey time, reflecting that the road network will operate with improved efficiency and journey reliability. There are routes that predict increases, but these are marginal and would not be discernible.

Scenario 2 Vs Scenario 4

- 10.5 This compares the delivery of the development and the NQ, including mitigation against the Reference Case. The results are comparable to Scenario 3, which demonstrates that the development of the NQ will not have a material impact on journey times.

Journey Time Summary

- 10.6 The results of journey time analysis and the betterment observed indicates that the development will not have a severe impact.

11 Road Network Review - Link Assessment

Introduction

- 11.1 Paramics has the capability to review link flows within the modelled road network. This chapter reviews the link flow within the model constraints. This assesses the difference in flows incrementally from the reference case. This demonstrates the capability of the highway network to accommodate the increase in trips from the development.

Assessment Results

- 11.2 The links that are expected to increase by 10% or greater, the threshold identified in the Scoping Note, are indicated below.

Route	Scenario 2 Vs Scenario 3		Scenario 2 Vs Scenario 4	
	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1 - West of A14 Roundabout	6%	5%	5%	4%
2 - South of A14 Roundabout	6%	5%	5%	4%
3 - East of A14 Roundabout	10%	8%	9%	7%
4 - Bucklesham Access off A14 Roundabout	-1%	0%	-4%	-1%
5 - North of A14 Roundabout	11%	14%	10%	14%
6 - Newbourne Road - East of A12 Roundabout	69%	94%	76%	106%
7 - A12 - North of Newbourne Rd Roundabout	13%	15%	13%	15%
8 - Ipswich Rd North	76%	97%	84%	109%
9 - Foxhall Rd East of Dobbs Ln	21%	20%	21%	19%
10 - Barrack Sq - A12 Roundabout Approach	14%	41%	15%	41%
11 - Eagle Way - West of Barrack Sq\A12 Roundabout	2%	3%	1%	2%
12 - Barrack Sq -South of Gloster Rd	3%	5%	2%	5%
13 - Gloster Road - South of Gated Access	24%	81%	25%	82%
14 - A12 - North of Barrack Sq Roundabout	18%	7%	19%	8%
15 - Eagle Way - West of Anson Rd Roundabout	3%	2%	2%	4%
16 - Anson Rd - A12 Roundabout Approach	8%	-5%	9%	-4%
17 - Anson Rd - Tesco Roundabout Western Approach	8%	-5%	9%	-4%
18 - Anson Rd - Tesco Roundabout Eastern Approach	10%	22%	10%	22%
19 - Gloster Road - South of Anson Rd	20%	85%	23%	84%
20 - Anson Rd- East of Felixstowe Rd	6%	-2%	5%	-3%
21 - Felixstowe Rd North of Anson Rd	-1%	6%	-4%	6%
22 - A12 - South of Park & Ride Roundabout	12%	7%	12%	8%
23 - Main Rd - North of Felixstowe Rd	-1%	5%	-2%	4%
24 - Main Rd - South of Felixstowe Rd	-1%	1%	0%	0%
25 - A12 - North of Park & Ride Roundabout	8%	2%	7%	2%
26 - A1214 - West of Park & Ride Roundabout	15%	7%	15%	8%

27 - A1214 - West of Dobbs Ln	13%	6%	14%	8%
28 - North Of Ropes Dr (East) Roundabout	-3%	-3%	-2%	-6%
29 - Ropes Dr (East) South of A1214	0%	1%	-1%	0%
30 - A 1214 - West of Ropes Drive (East)	10%	8%	12%	11%
31 - Ropes Dr (West) - South of A1214	-5%	-3%	-7%	-3%
32 - A1214 East of Bell Ln	0%	0%	0%	0%
33 - A1214 - West of Bell Ln	7%	7%	7%	8%
34 - Bell Ln - South of A1214	31%	34%	34%	35%
35 - Foxhall Rd - West of Bell Ln	6%	13%	6%	12%
36 - Monument Farm Ln - South of Foxhall Rd	-3%	-5%	-2%	-5%
37 - Foxhall Rd - East of Monument Farm Ln	14%	19%	13%	18%
38 - Hall Rd - South of Foxhall Rd	5%	-4%	2%	-2%
39 - Dobbs Ln - North of Foxhall Rd	15%	9%	9%	8%

Figure 11a: Link analysis

- 11.3 The results demonstrate that the delivery of the development has the potential to increase flows in numerous locations. The increases are not unexpected given that the delivery of the development will increase traffic levels. However, an increase in traffic does not necessarily relate to an increase in delay or congestion.
- 11.4 The potential to increase delay and congestion relates not only to the link, but the junctions within any link. The potential impact at junctions is considered later in this report.
- 11.5 The theoretical highway capacity refers to the maximum level of traffic that can be accommodated; this being a function of the design and width of the road. Traffic flow along a link has the potential to create congestion if the theoretical highway capacity of that link is exceeded. A review of the traffic levels indicates that the predicted traffic levels do not exceed the theoretical highway capacity.

Link	Peak flow
3 - East of A14 Roundabout	4,055
5 - North of A14 Roundabout	4,310
6 - Newbourne Road - East of A12 Roundabout	629
7 - A12 - North of Newbourne Rd Roundabout	4,720
8 - Ipswich Rd North	628
9 - Foxhall Rd East of Dobbs Ln	1,906
10 - Barrack Sq - A12 Roundabout Approach	1,256
13 - Gloster Road - South of Gated Access	705
14 - A12 - North of Barrack Sq Roundabout	3,380
18 - Anson Rd - Tesco Roundabout Eastern Approach	921
19 - Gloster Road - South of Anson Rd	764
22 - A12 - South of Park & Ride Roundabout	3,842
26 - A1214 - West of Park & Ride Roundabout	1,735
27 - A1214 - West of Dobbs Ln	1,301
30 - A 1214 - West of Ropes Drive (East)	898
34 - Bell Ln - South of A1214	417
35 - Foxhall Rd - West of Bell Ln	1,616
37 - Foxhall Rd - East of Monument Farm Ln	1,900
39 - Dobbs Ln - North of Foxhall Rd	246

Figure 11b: Theoretical highway capacity – highest peak traffic flow reported across all modelling tests

Interpretation of results

- 11.6 This chapter has reviewed the results of the link traffic flows predicted by the Paramics traffic model. This initially identified the links predicted to experience a moderate increase, indicated by a 10% increase. The operation of a link is a factor of the available capacity. Therefore, a review of the predicted traffic flow against the theoretical capacity has been completed.

11.7 The review has indicated that the predicted flows will not exceed the theoretical capacity levels.

Link Assessment Summary

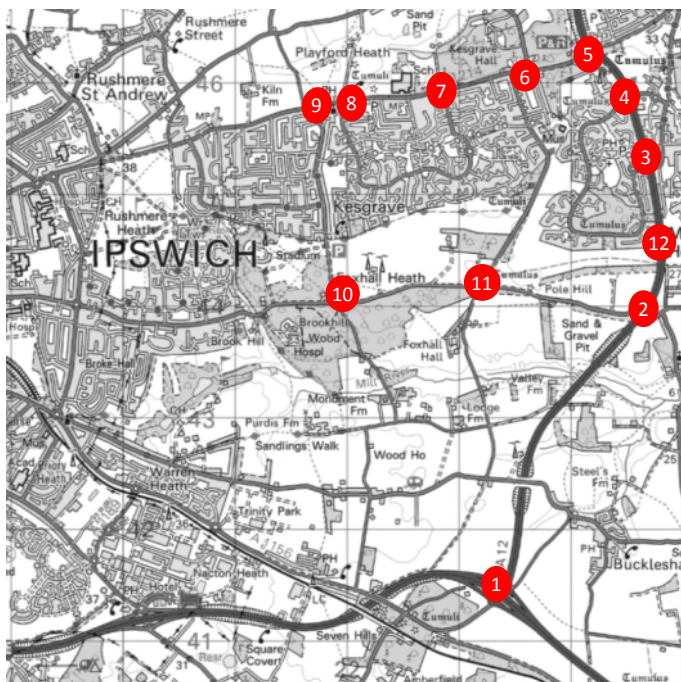
11.8 The above assessment demonstrates that the predicted traffic flows will be within the theoretical capacity of the link and consequently the additional development trips should not give rise to congestion and delay.

12 Road Network Review – Junction Queues

Introduction

12.1 The Paramics model also predicts the extent of queuing at numerous junctions across the modelled area. Queue length analysis is intended to provide a more detailed picture of the impacts at specific junctions within the model network.

12.2 At this stage the analysis of queue lengths has been based on the average hourly maximum queue length. The hourly maximum for each individual model run has been calculated and then the average of all runs has been calculated for each hour. Those locations that have been assessed are indicated below.



1 Junctions included in Paramics

Figure 12a: Junction Locations

12.3 Junctions 1 to 12 have been modelled in the aforementioned Paramics Assessment, for which the results are outlined in this chapter.

12.4 Through further discussion with SCC, it was agreed that additional junctions moving towards Ipswich should be analysed. The impact on any offsite Junctions will be dealt with via contributions.

Assessment Results

12.5 The difference in queues has been assessed on the following criteria basis.

Rating	Score
Mean Maximum Queue Length difference of less than 5 vehicles	
Negligible increase with a difference between 5 and 15 vehicles	
Minor increase with a difference between 15 and 25 vehicles	
Moderate Increase with a difference between 25 and 50 vehicles	
Major Increase with a difference greater than 50 vehicles	

Junction	Scenario 2 Vs Scenario 3		Scenario 2 Vs Scenario 4		
	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)	
1	A12	-25	-86	-24	-85
	Bucklesham Lane	-1	0	-1	0
	A14 East	-75	-78	-75	-79
	A1156	10	8	10	8
A14 West	2	-15	3	-15	
2	A12 North	2	-79	3	-78
	Newbourne Road	0	-73	1	-71
	A12 South	-27	-259	-27	-258
	Foxhall Road	-98	6	-95	4
3	A12 North	-32	-1	-29	-2
	Barrack Square	-2	-61	-1	-61
	Eagle Way	-60	9	-62	12
	A12 South	5	1	7	0
4	A12 North	-51	-44	-51	-44
	Anson Road	5	7	2	7
	A12 South	-2	6	-2	15
	Eagle Way	-1	-1	-1	0
5	A12 North	-17	-53	-24	-50
	Main Rd East	-15	-9	-15	-8
	A12 South	13	12	11	10
	Main Rd West	-9	-3	-4	1
	Park & Ride	1	1	1	1
6	A1214 East	0	0	0	0
	Dobbs Lane	-9	1	-10	1
	A1214 West	-73	-2	-73	-2
7	Northern Arm	0	0	0	0
	A1214 East	1	0	1	0
	Ropes Drive	-5	-2	-6	-2
	A1214 West	-7	1	-10	1
8	A1214 East	0	-1	0	0
	Ropes Drive	3	0	2	0
	A1214 West	1	1	0	1
9	A1214 East	1	2	1	1
	Bell Lane	-10	-8	-10	-8
	A1214 West	2	1	1	1
10	Bell Lane	1	5	4	4
	Foxhall Road East	2	14	4	15
	Monument Farm Lane	0	0	0	0
	Foxhall Road West	0	-2	0	-2
11	Dobbs Lane	1	2	1	2
	Foxhall Road East	3	14	4	14
	Hall Road	0	1	0	0
	Foxhall Road West	1	-2	1	0

Figure 12b: Junctions with Queues

Interpretation of results

- 12.6 This chapter has provided a detailed review of the levels of queuing predicted at numerous junctions within the Paramics model. This assessment identifies the change in queuing following the introduction of the development. This has demonstrated that there are several junctions that will be improved, with only a limited number experiencing a negligible increase.

Queue Summary

- 12.7 Any increases that are predicted are typically on a single arm rather than across the junction as a whole. This demonstrates that at this level of assessment the delivery of the residential element will not create a significant level of congestion. This is supported by the results of the journey time results, which predicts betterment across the majority of the routes.

Junction 12 – Additional Site Access / A12

- 12.8 As part of the access proposals, a new junction on the A12 is proposed. The results for the predicted queuing are presented as follows.

Junction	Scenario 3		Scenario 4	
	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
A12 North	36	30	40	31
Site Access	8	6	8	9
A12 South	18	12	18	12

Figure 12c: Junction 12

- 12.9 The junction is controlled by signals which will invariably halt the flow of traffic, which will generate the predicted queuing. However, this in itself does not give rise to a concern. This junction lies within Route 1 journey time corridor. The results of this route indicate improvement following the delivery of the development. Therefore, this indicates that the operation of this junction will not impede the free flow of traffic.

Assessment Summary

- 12.10 On the basis of the link and junction queuing review, there are no locations that are highlighted that give rise to concern in relation to the level of queuing / congestion predicted and cannot be regarded as 'severe' as described in the NPPF. . Therefore, it is considered that the development should be supported from a transport and highways view point.

13 Limitations

- 13.1 The conclusions and recommendations highlighted above are based on all available background information for the site and all design solutions are based upon the planned usage of the site.
- 13.2 Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.
- 13.3 The benefits of this report are provided to Carlyle Land and Commercial Estates Group for the proposed development on land at Adastral Park.