

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Carlyle Land Ltd and Commercial Estates Group to provide technical advice on viability and delivery on a proposed mixed-use development at Adastral Park, Martlesham Heath, Suffolk.

An outline planning application has been submitted which, amongst other things, contains a Transport Assessment. This document provides technical evidence to demonstrate robustness of the proposed transport related mitigation measures proposed.

An Updated Transport Assessment has been produced to respond to queries raised by both Suffolk Coastal District Council and Suffolk County Council.

The Updated Transport Assessment is attached. The purpose of this cover sheet is to provide a brief summary of the additional information contained within the document.

2 Updated Transport Assessment – Additional Contents

ROAD SAFETY AUDIT

Stage 1 Road Safety Audits have been undertaken for all site access and offsite highway improvement points. A Designers Response has also been completed. This information can be found in Appendix I.

DESIGN DRAWINGS

Minor revisions have been made to the design drawings in support of the recommendations made following the Stage 1 Road Safety Audits. This information can be found in Appendix D (drawings HL-02 C, HL-04 C, HL-05 D, HL-06 A, HL-11 C, HL-22 B, HL-23 B, HL-24 B, HL-25 A, HL-26 B and HL-27 B refers).

NORTHERN QUADRANT – LOSS OF BT PARKING SPACES

Commentary has been made on the loss of car parking spaces as a consequence of delivering the Northern Quadrant access road. Paragraph 5.30 within the main body of the document refers.

PEDESTRIAN AND CYCLE CONNECTIVITY

Requests were made to illustrate the proposed offsite pedestrian and cycle connection proposals. This information can be found in Appendix D (drawing HL-101 A and 102 A refer).

NORTHERN QUADRANT ACCESS

Interchange of northern quadrant access with green infrastructure routes to be part of relevant reserved matters application needs to be presented. This information can be found in Appendix D (drawing HL-06 A refers).

**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 c0.6ha (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 Highway England (HE) representatives to work toward 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.

The process followed has been used by BCL as the basis for this Transport Assessment, with the key agreements applied to the development proposals.

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 effortlessly.

The potential impacts on the highway network have been tested on the agreed methodology. This included the production of a calibrated and validated Paramics Micro-simulation traffic model. This has assessed the locations within the local highway most likely to be effected. A further study of the Copdock Interchange has also been carried out.

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 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. The Travel Plan proposes a target for the site which will reduce the mode share by single occupancy vehicles by 10%.

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 through the agreed methodology. This has resulted in the identification of a range of offsite interventions that will be delivered by the development. This included:

- **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 4 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. Newbourne Road to be widened to two lanes with a three lane flare on approach. Foxhall Road to be widened to two lanes with a three 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. 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.
- **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.
- **A1189 Heath Road / Foxhall Road Roundabout:** Foxhall Road East Approach to be widened by 1m on entry width, and Foxhall Road West Approach to be widened by 1m on entry width and 1m on flare length.
- **A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout:** Bixley Road Approach to be widened by 0.3m on entry width.
- **A1214 / A1189 Gyratory Junction:** Eastern Roundabout to be realigned so that the Entry Width from Heath Road can be increased to provide a queuing length of 18m. Reinstate full movements at the Western Roundabout to remove U-turns from Eastern Roundabout.

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 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. At the time of writing, with the final quantum and details of development are yet to be finalised. The Proposed Development comprises the delivery of the following primary land uses:
 - Up to 2,000 homes
 - Employment area of c0.6ha (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)
- 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

- 2.4 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.
- 2.5 The application provides for some 2,000 dwellings that will build on the existing character of the area and improve links to the surrounding countryside. 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.
- 2.6 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:
- 2.7 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.
- 2.8 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.
- 2.9 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.
- 2.10 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

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

- Method of trip distribution
- Travel Plan principles.

Transport Assessment Structure

- 2.13 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 behavior, 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 councils 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 proposal 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*
- iv. important hi-tech business at BT;*
- v. where the Martlesham Heath Business Campus including Adastral Park has been designated a Strategic Employment Area;*
- vii. 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;*
- viii. that has created its own distinctive identity with smaller readily distinguishable villages, neighbourhoods and communities*
- ix. within the larger area;*
- x. 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;*
- xi. where priority has been given to creating a safe and attractive environment, including the provision of advanced planting and*
- xii. landscaping to create new settlement boundaries that blend with the surrounding landscape and contribute to biodiversity and the ecological network;*

- xiii. that includes the retention of designated Sandlings areas on the edge of Ipswich because of their historic and biodiversity interests;
- xiv. that preserves and enhances environmentally sensitive locations within the Eastern Ipswich Plan Area and its surroundings; and
- xvi. that maximises opportunities to achieve access to green space, including the countryside.
- xvii. 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.

Suffolk Local Transport 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 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 Based on 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.

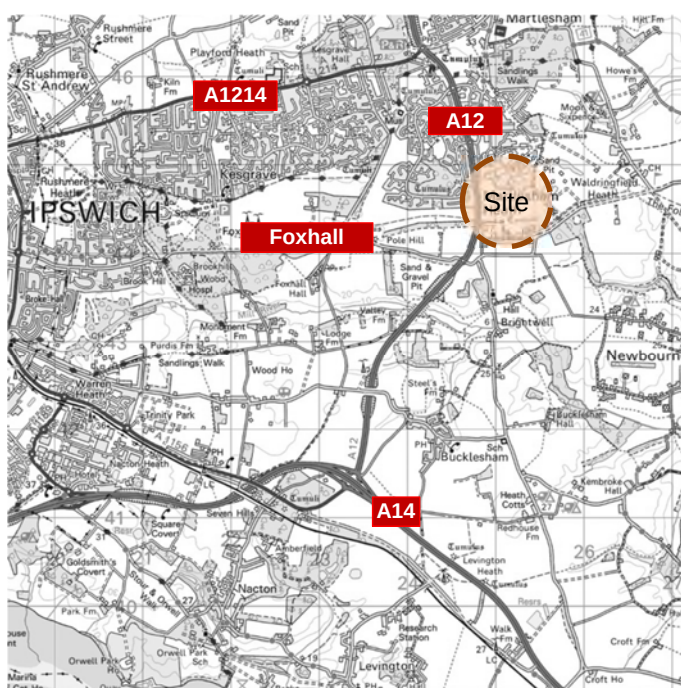


Figure 4d: Site Location in relation to the local road network

- 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 a 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 connection 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 Gloster Road and Barrack square has segregated footway/cycleway link. The footbridge and underpass also has cycleway which allows cycle paths in eastern Ipswich and towards the town centre.
- 4.16 There is a public footpath which runs from the north of Martlesham heath along Gloster Road and the western edge of, to Newborne Road to the south of the Park.

Public Rights of Way

- 4.17 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.
- 4.18 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.
- 4.19 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

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

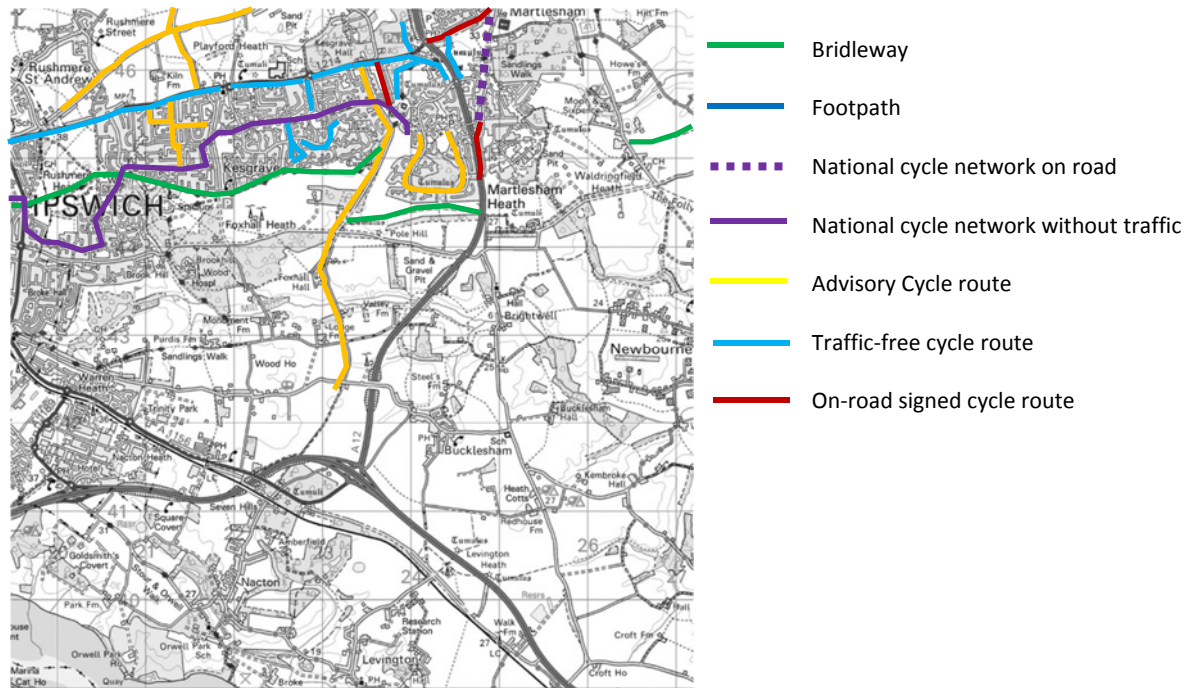


Figure 4g: Public Right of Way

Public Transport – Road

4.21 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	Ipswich – Leiston Operator - First in Norfolk & Suffolk	Monday to Friday: Every 30 mins
/65B	Halesworth – Holton Operator - First in Norfolk & Suffolk	Monday to Friday (except bank holidays): 1 hr 30 min
511	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
972	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

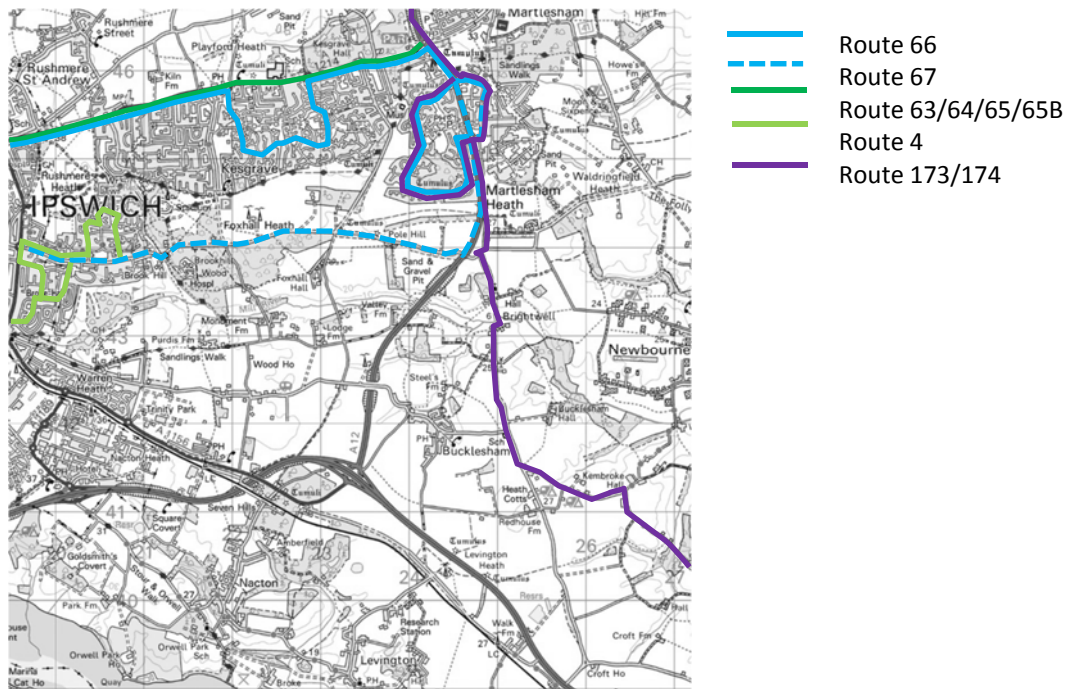


Figure 4f: Bus Routes map

Public Transport - Rail

- 4.22 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).
- 4.23 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

- 4.24 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.

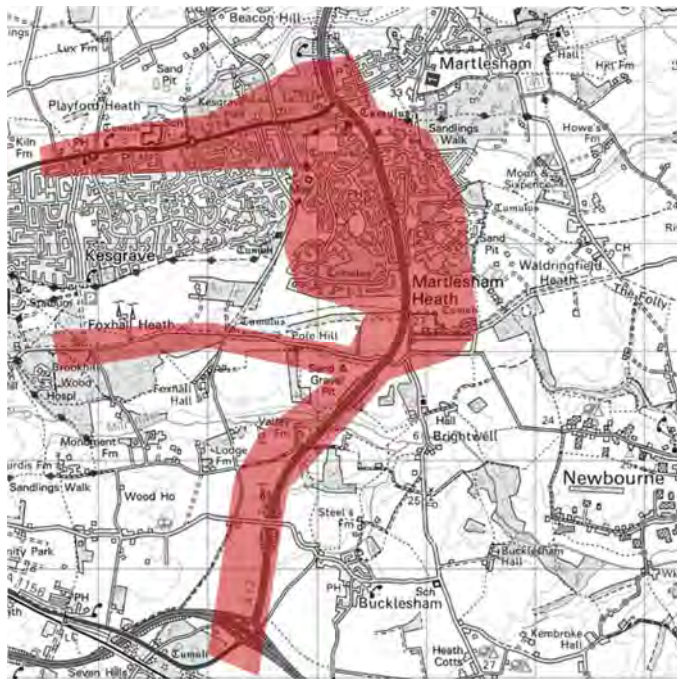


Figure 4g: Accident study area

4.25 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.

4.26 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

4.27 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.

- 4.28 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

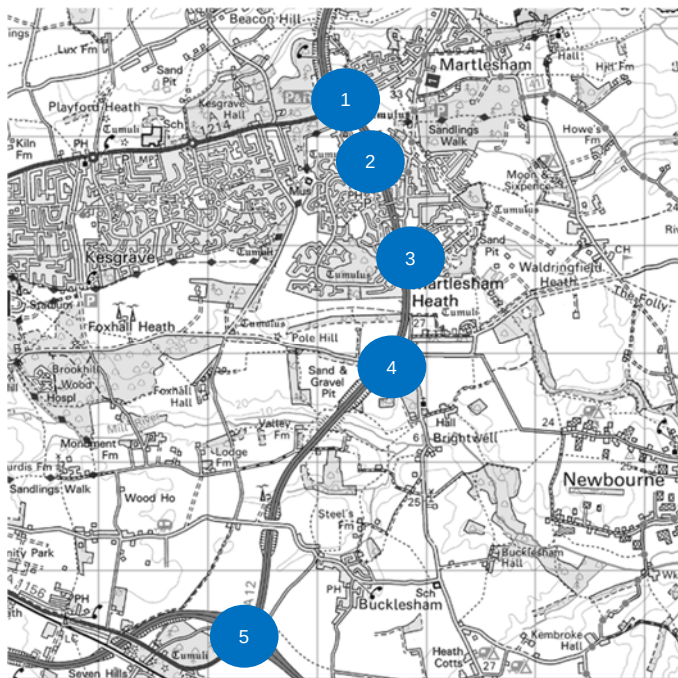


Figure 4j: Accident clusters

Cluster 1 – A12 jw A1214 Main Road

- 4.29 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.
- 4.30 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.
- 4.31 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.
- 4.32 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

- 4.33 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.
- 4.34 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.
- 4.35 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

- 4.36 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.
- 4.37 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.
- 4.38 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

- 4.39 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.
- 4.40 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.
- 4.41 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

- 4.42 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.

- 4.43 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
- 4.44 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

- 4.45 144 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.
- 4.46 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, this 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 the existing Newbourne Road Junction on the A12.
- 5.8 As the development quantum is increased, a further signal controlled junction on the A12 will be provided, north of the Newbourne Road junction. The existing roundabout between the A12 and Newbourne Road will be improved with wider approaches to increase traffic capacity.
- 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 BT's 'Northern Quadrant' 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 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 Adastral Park Development.

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. At the time of writing it is considered that no 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 until the routes are self-funding.

Offsite Interventions

- 5.25 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 4 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. Newbourne Road to be widened to two lanes with a three lane flare on approach. Foxhall Road to be widened to two lanes with a three 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. 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.
- **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.
- **A1189 Heath Road / Foxhall Road Roundabout:** Foxhall Road East Approach to be widened by 1m on entry width, and Foxhall Road West Approach to be widened by 1m on entry width and 1m on flare length.
- **Bixley Road / Foxhall Road Roundabout:** Bixley Road Approach to be widened by 0.3m on entry width.
- **A1214 / A1189 Gyratory Junction:** Eastern Roundabout to be realigned so that the Entry Width from Heath Road can be increased to provide a queuing length of 18m. Reinstate full movements at the Western Roundabout to remove U-turns from Eastern Roundabout.

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

Parking Provision

5.27 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.”

5.28 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

5.29 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

- 5.30 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 BT 'Northern Quadrant' site. The delivery of the new road alignment will result in a loss of parking spaces. 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 applications for the redevelopment of the northern quadrant 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

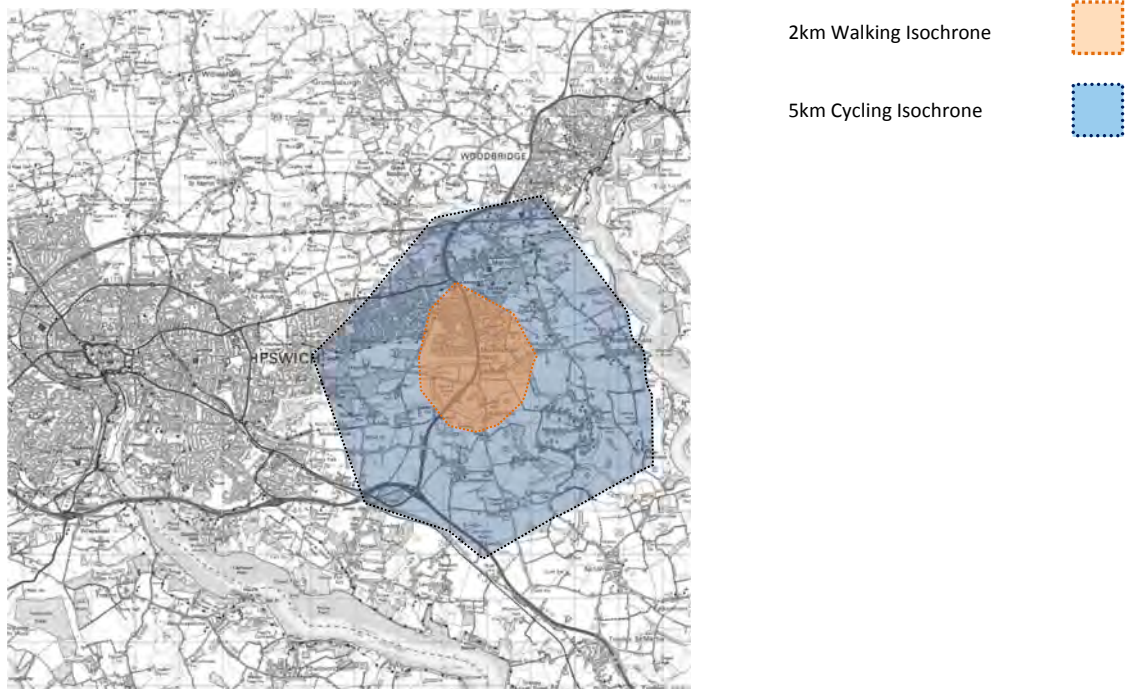
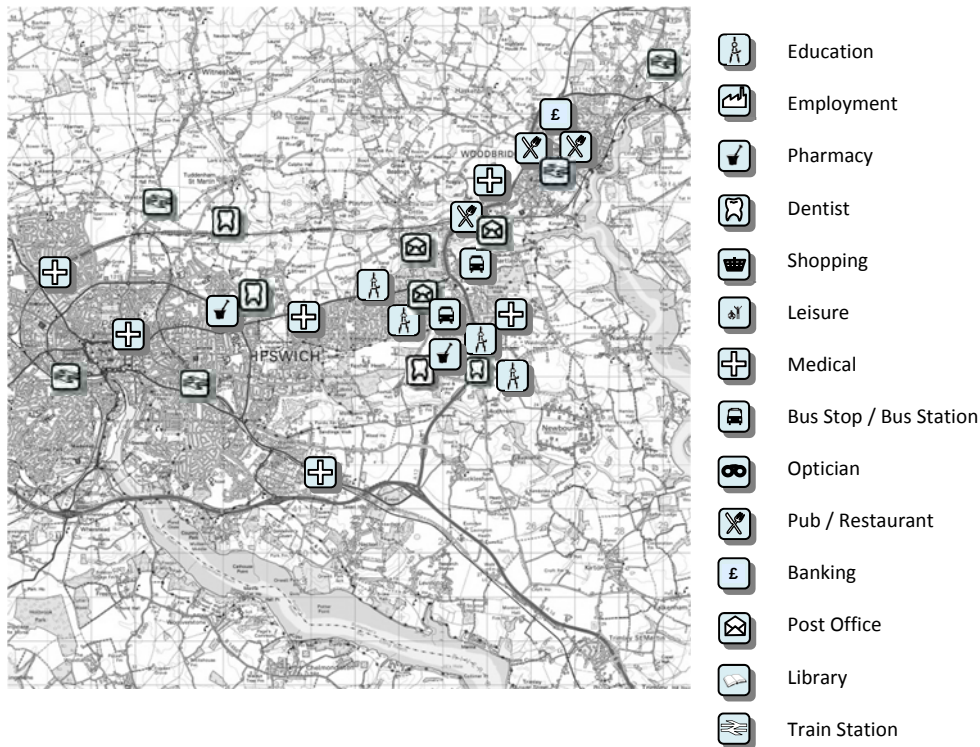
Accessibility

- 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



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 The former 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. In particular, the phased approach to the proposed development.

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 development proposals, local traffic generally increase 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 Benefits

- 7.1 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.
- 7.2 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.
- 7.3 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.
- 7.4 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

- 7.5 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

- 7.6 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.
- 7.7 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 10% modal shift.

Travel Plan Coordinator

- 7.8 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.
- 7.9 The Travel Coordinator role will be funded for a period of 5 years.
- 7.10 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

Travel Plan Measures

- 7.11 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.
- 7.12 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.
- 7.13 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.

Study Area

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

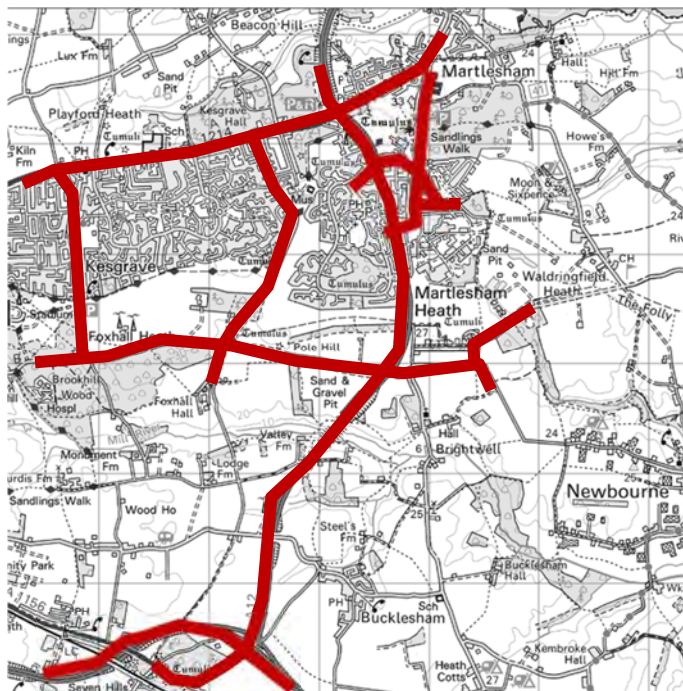


Figure 8a: Paramics Study Area

- 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.
- 8.15 The TRICS outputs and a Technical Note providing supporting information are contained in Appendix A and illustrated below.
- 8.16 The resultant total external trip generation is presented below.

Time Periods	Housing		Primary School		Employment	
	In	Out	In	Out	In	Out
0700-0800	148	514	17	5	88	19
0800-0900	290	724	91	63	222	40
0900-1000	276	344	11	19	104	31
1600-1700	556	346	18	31	37	119
1700-1800	664	396	10	15	27	177
1800-1900	470	342	6	8	17	68

Figure 8b: Resultant external trips

Trip Rate Sensitivity Test

- 8.17 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 8c: Comparison of residential trip rates

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

Previous Mitigation

- 8.19 The previous assessment identified a range of highway interventions. These will be assessed through the modelling process to identify need / timing. The previously identified mitigation measures are:

- **A12 / A14 Levington Seven Hills Interchange:** Partial signalisation and localised widening.
- **A12 / Foxhall Road / Newbourne Road Roundabout:** Conversion to signalised crossroads.
- **A12 / Barrack Square / Eagle Way Roundabout:** Conversion to signalised junction.
- **A12 / Anson Road / Eagle Way Roundabout:** conversion to signalised crossroads
- **A12 / A1214 Roundabout:** Traffic – optimised signal timings.
- **Gloster Road / Barrack Square Priority Junction:** Conversion to signalised junction.

- 8.20 Following the initial modelling, it was observed that an alternative mitigation strategy would reduce delay and queuing. The alteration to the mitigation strategy was required due to the different assessment years, traffic growth projections and alteration to the development quantum.

- 8.21 The final mitigation strategy is identified below.

- **A14 / A12 / A1156 Levington Seven Hills Interchange (same solution):** 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 4 lane approaches for the A12 Northbound and Southbound with corresponding widening on the circulatory. Newbourne Road to be

widened to two lanes with a three lane flare on approach. Foxhall Road to be widened to two lanes with a three 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. 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.
- **A12 / A1214 Roundabout (same solution):** 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.
- **A1189 Heath Road / Foxhall Road Roundabout:** Foxhall Road East Approach to be widened by 1m on entry width, and Foxhall Road West Approach to be widened by 1m on entry width and 1m on flare length.
- **A1189 Bixley Road / A1156 Felixstowe Road Roundabout:** Bixley Road Approach to be widened by 0.3m on entry width.
- **A1214 / A1189 Gyratory Junction:** Eastern Roundabout to be realigned so that the Entry Width from Heath Road can be increased to provide a queuing length of 18m. Reinstate full movements at the Western Roundabout to remove U-turns from Eastern Roundabout.

- 8.22 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 I.

Traffic Scenarios

- 8.23 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 2017 reflecting the existing operation of the road network
- **Scenario 3:** Reference Case 2027 reflecting the expected future operation of the road network without development
- **Scenario 4:** Do-minimum 2027 reflecting the future year test plus the Adastral Park development, without mitigation
- **Scenario 5:** Do-Something 2027 reflecting the future year test plus the Adastral Park development, with mitigation
- **Scenario 6:** Do-Something 2027 reflecting the future year test plus the Adastral Park development, with mitigation together with reduction in speed limits on the A12

Paramics Output

- 8.24 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

- 8.25 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. The model outputs are contained in Appendix F.

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.
- **Completed Trips (vehicles):** The number of completed trips recorded during the model simulation.

9.2 The first two measurements are averages so can be used to compare between the various scenarios. The final measurement is an absolute and is dependent on congestion on the network (as this will prevent trips from completing) and the demand within the model (i.e. the number of trips actually trying to complete). As demand differs between scenarios, as well as small variations between runs of the same scenario, we cannot expect the number of completed trips to be the same. However, as the demands do not differ significantly it can still provide an indication of the relative congestion on each network.

Network Mean Delay

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

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Morning Peak	252	260	350	406	302	294
Evening Peak	260	270	402	708	322	318

Figure 9a: Network Mean Delay (s)

9.4 The results indicate that delay over the network increases from Scenario 2 to Scenario 3. This is expected as traffic levels increase through background growth. Following the introduction of the development, the delay is predicted to increase. This is not unexpected as the proposed development will introduce additional trips onto the road network. However, following the introduction of the mitigation strategy, the expected delays decrease significantly.

9.5 The reduction in the speed limits on the A12 has a minor beneficial impact.

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 over the modelling period is presented below.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Morning Peak	56	55	39	34	48	50
Evening Peak	53	51	33	19	44	44

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 reducing to 34kph and 19kph in the morning and evening peak respectively. However, following the introduction of the mitigation strategy, the expected speeds increase significantly, in excess of Scenario 3.
- 9.9 The reduction in the speed limits on the A12 has a minor beneficial impact.
- 9.10 This demonstrates that the road network will not be affected following the delivery of the development and the mitigation strategy offers better than nil-detriment.

Completed Trips

- 9.11 Analysis of the total number of completed trips within each scenario, across the entire morning and evening peak model periods, is presented below. A completed trip represents a vehicle that has successfully reached a destination.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Morning Peak	29208	29496	31535	30871	32745
Evening Peak	32112	32455	35711	31735	36018

Figure 9c: Completed trips

- 9.12 Analysis of the above figure indicates that the number of trips increase through the introduction of the residential demands. This is not unexpected as the delivery of these developments will fundamentally increase the number of trips in the local road network. In order to ascertain the significance of the change in trips, it is important to identify the total trip demand. This is indicated below.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Morning Peak	29688	29989	33015	33401	33401
Evening Peak	32489	32823	36176	36512	36512

Figure 9d: Total demand

- 9.13 A review of completed trips against total demand provides an insight to how well the model operates. Not all trips will be completed, as numerous trips will start at the end of the modelling period and these trips will not have sufficient time to reach the end destination. The percentage of completed trips is presented below.

Time period	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Morning Peak	98%	98%	96%	92%	98%
Evening Peak	99%	99%	99%	87%	99%

Figure 9e: Percentage of completed trips

- 9.14 This demonstrates that the introduction of development traffic reduces the percentage of completed trips by in the region of 4-12%, the worst case being the PM peak hour. However, these increase back to the Scenario 3 levels, demonstrating that following the introductions of the highway interventions, the operation of the highway network is not severely affected.
- 9.15 The reduction in the speed limits on the A12 has no impact on this parameter.

Interpretation of Results

- 9.16 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

- The mean delay increases following the introduction of the development
- Following mitigation, the mean delay decreases

Average Speeds

- The average speed decreases following the introduction of the development
- Following mitigation, the average speed increases

Completed Trips

- The percentage of completed trips is not severely affected following the introduction of the highway interventions

Results Summary

- 9.17 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.
- 9.18 Based on the results of the network statistics, from a highway stand point, the residential element will not have a severe impact on the highway network, as prescribed by NPPF and therefore 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:

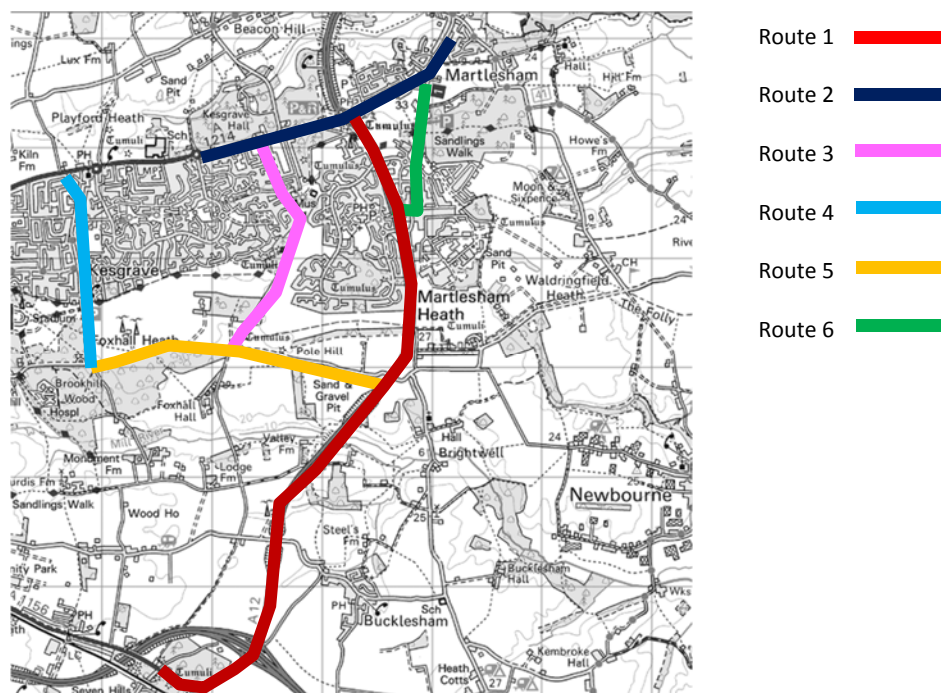


Figure 10a: Journey time routes

- 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 difference in flows has been assessed against the guidance provided in Volume 12, Section 2 from DMRB. This identifies acceptable differences when comparing two sets of data. The identified thresholds are 15% difference, or 60 seconds if higher. On this basis the following criteria has been followed.

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

Figure 10b: Impact assessment

Route			Scenario 3 Vs Scenario 4		Scenario 3 Vs Scenario 5	
			AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1	A12 between A1214 and the A14	Northbound	-21.0%	232.9%	-39.4%	-13.9%
		Southbound	27.6%	24.5%	-21.1%	-34.9%
2	The A1214 / Main Street between Ropes Drive and Felixstowe Road	Eastbound	32.1%	228.0%	13.5%	50.4%
		Westbound	-38.4%	693.3%	-39.3%	-2.0%
3	Dobbs Lane between A1214 and Foxhall Road	Northbound	0.6%	3.1%	4.8%	12.5%
		Southbound	12.5%	132.0%	0.5%	0.1%
4	Bell Lane between A1214 and Foxhall Road	Northbound	10.9%	-7.2%	4.9%	0.4%
		Southbound	117.2%	6.2%	-53.9%	18.7%
5	Foxhall Road between Bell Lane and A12	Eastbound	413.4%	213.8%	-52.9%	5.7%
		Westbound	1.3%	4.0%	4.8%	7.6%
6	Felixstowe Road / Gloster Road between Main Street and A12	Southbound	-15.8%	166.4%	-16.8%	-67.1%
		Northbound	-33.3%	788.9%	-37.7%	-15.7%

Figure 10c: Routes with change

Scenario 3 Vs Scenario 4

This compares the delivery of the development, without mitigation, against the reference case. This identifies that there are several routes where the journey times are expected to increase.

Scenario 3 Vs Scenario 5

- 10.3 This compares the delivery of the development, including mitigation against the reference case. This identifies that following the introduction of the mitigation, all but one of the results indicated nothing more than minor impacts.
- 10.4 Route 2, eastbound in the evening peak predicts an increase of 50.4%. This represents an improvement, before the introduction of the mitigation, this route increased by 228%. This route is important link into Ipswich and includes several junctions.
- 10.5 Journey time provides a review of a particular link. Trip reliability is a function of several factors, including queuing at junctions, which is discussed in subsequent sections.

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

A12 Speed limit reduction

- 10.7 To determine the impact of reduction of the speed limit, a comparison between Scenarios 5 and 6 has been carried out. This is presented below.

Route			Scenario 5 Vs Scenario 6	
			AM (8-9)	PM (5-6)
1	A12 between A1214 and the A14	Northbound	-1	-2
		Southbound	-4	59
2	The A1214 / Main Street between Ropes Drive and Felixstowe Road	Eastbound	-42	-66
		Westbound	-1	-2
3	Dobbs Lane between A1214 and Foxhall Road	Northbound	2	10
		Southbound	-1	1
4	Bell Lane between A1214 and Foxhall Road	Northbound	0	6
		Southbound	106	47
5	Foxhall Road between Bell Lane and A12	Eastbound	2	1
		Westbound	3	5
6	Felixstowe Road / Gloster Road between Main Street and A12	Southbound	0	-105
		Northbound	2	-1

Figure 10d: Routes with change

- 10.8 This demonstrates that on balance reducing the speed limit on the A12 does not have a material 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 3 Vs Scenario 4		Scenario 3 Vs Scenario 5	
	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1 - West of A14 Roundabout	-35%	-9%	-34%	-2%
2 - South of A14 Roundabout	-28%	-9%	-27%	-4%
3 - East of A14 Roundabout	-40%	-8%	-38%	-4%
4 - Bucklesham Access off A14 Roundabout	-43%	-12%	-41%	-11%
5 - North of A14 Roundabout	-11%	-8%	-9%	16%
6 - Newbourne Road - East of A12 Roundabout	133%	228%	107%	219%
7 - A12 - North of Newbourne Rd Roundabout	-4%	-19%	2%	14%
8 - Ipswich Rd North	137%	246%	92%	229%
9 - Foxhall Rd East of Dobbs Ln	-22%	0%	28%	16%
10 - Barrack Sq - A12 Roundabout Approach	-11%	-57%	13%	31%
11 - Eagle Way - West of Barrack Sq\A12 Roundabout	-7%	-28%	15%	-3%
12 - Barrack Sq -South of Gloster Rd	-14%	-68%	-7%	-5%
13 - Gloster Road - South of Gated Access	-6%	-38%	33%	67%
14 - A12 - North of Barrack Sq Roundabout	6%	-17%	9%	11%
15 - Eagle Way - West of Anson Rd Roundabout	-16%	-34%	-16%	-3%
16 - Anson Rd - A12 Roundabout Approach	11%	-42%	14%	-6%
17 - Anson Rd - Tesco Roundabout Western Approach	11%	-44%	15%	-7%
18 - Anson Rd - Tesco Roundabout Eastern Approach	1%	-50%	5%	-4%
19 - Gloster Road - South of Anson Rd	-22%	-46%	-5%	36%
20 - Anson Rd- East of Felixstowe Rd	-9%	-10%	-5%	-4%
21 - Felixstowe Rd North of Anson Rd	-7%	-53%	-3%	-8%
22 - A12 - South of Park & Ride Roundabout	0%	-32%	-2%	10%
23 - Main Rd - North of Felixstowe Rd	-15%	-43%	-15%	-5%
24 - Main Rd - South of Felixstowe Rd	-23%	-45%	-28%	-1%
25 - A12 - North of Park & Ride Roundabout	-10%	-32%	-6%	2%
26 - A1214 - West of Park & Ride Roundabout	8%	-23%	-1%	13%
27 - A1214 - West of Dobbs Ln	20%	-14%	11%	15%
28 - North Of Ropes Dr (East) Roundabout	-8%	-12%	-8%	-1%
29 - Ropes Dr (East) South of A1214	-23%	-20%	-22%	1%
30 - A 1214 - West of Ropes Drive (East)	42%	1%	30%	23%
31 - Ropes Dr (West) - South of A1214	-30%	-6%	-26%	-3%
32 - A1214 East of Bell Ln	-14%	-5%	-13%	1%
33 - A1214 - West of Bell Ln	-11%	8%	-7%	14%
34 - Bell Ln - South of A1214	-21%	60%	21%	51%
35 - Foxhall Rd - West of Bell Ln	-14%	-16%	9%	2%
36 - Monument Farm Ln - South of Foxhall Rd	-20%	-23%	-14%	-20%
37 - Foxhall Rd - East of Monument Farm Ln	-13%	-2%	16%	14%
38 - Hall Rd - South of Foxhall Rd	589%	-34%	17%	-19%
39 - Dobbs Ln - North of Foxhall Rd	1%	27%	6%	16%

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, the delivery of the development will fundamentally increase traffic levels. However, an increase in traffic does not then necessarily relate to an increase in delay or congestion.
- 11.4 The potential to increase delay and congestion relates to not only 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 Two-way Vehicle Flow
5 - North of A14 Roundabout	4009
6 - Newbourne Road - East of A12 Roundabout	1056
7 - A12 - North of Newbourne Rd Roundabout	4456
8 - Ipswich Rd North	1003
9 - Foxhall Rd East of Dobbs Ln	1808
10 - Barrack Sq - A12 Roundabout Approach	1240
11 - Eagle Way - West of Barrack Square \ A12 Roundabout	481
13 - Gloster Road - South of Gated Access	820
14 - A12 - North of Barrack Sq Roundabout	3491
16 - Anson Rd - A12 Roundabout Approach	1638
17 - Anson Rd - Tesco Roundabout Western Approach	1461
19 - Gloster Road - South of Anson Rd	666
22 - A12 - South of Park & Ride Roundabout	3614
26 - A1214 - West of Park & Ride Roundabout	1473
27 - A1214 - West of Dobbs Ln	1217
30 - A1214 - West of Ropes Drive (East)	756
33 - A1214 - West of Bell Ln	1560
34 - Bell Ln - South of A1214	418
37 - Foxhall Rd - East of Monument Farm Ln	1783
38 - Hall Rd - South of Foxhall Rd	16
39 - Dobbs Ln - North of Foxhall Rd	204

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 as 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. This demonstrates that 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.

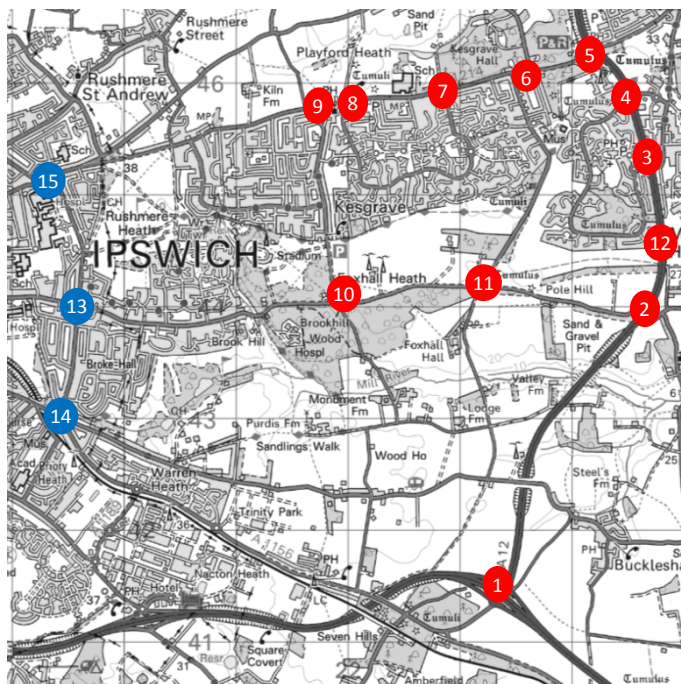


Figure 12a: Junction Locations

- 1 Junctions included in Chapter 12
- 1 Junctions included in Chapter 13

- 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 Suffolk County Council, it was agreed that additionally Junctions 13 to 15 would be modelled using a Traditional Assessment Methodology. The results for these junctions are outlined in Chapter 13.

Assessment Results

- 12.5 The difference in queues has been assessed against the methodology adopted within the STA assessment work. On this basis the following criteria has been followed.
- 12.6 The full results are attached in the appendices. The summary below highlights those junctions that report at least a minor increase in queuing.

Rating	Score
Mean Maximum Queue Length of 0 or 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 3 Vs Scenario 4		Scenario 3 Vs Scenario 5	
		AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1	A12	0	-9	7	0
	Bucklesham Lane	0	0	0	0
	A14 East	-3	0	-2	16
	A1156	-21	-12	-36	15
	A14 West	3	14	0	-9

Junction		Scenario 3 Vs Scenario 4		Scenario 3 Vs Scenario 5	
		AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
2	A12 North	12	25	3	3
	Newbourne Road	66	-48	20	-91
	A12 South	4	65	-11	-13
	Foxhall Road	47	50	-33	1
3	A12 North	-4	48	-28	-20
	Barrack Square	2	-5	-1	-13
	Eagle Way	-3	77	6	7
	A12 South	-13	14	4	1
4	A12 North	-21	61	-61	-9
	Anson Road	-2	5	-16	-2
	A12 South	-9	56	-8	32
	Eagle Way	-3	12	-3	-1
5	A12 North	-74	90	-75	-1
	Main Rd East	-25	29	-28	-3
	A12 South	-7	16	2	4
	Main Rd West	8	30	4	24
	Park & Ride	0	4	0	0
6	A1214 East	0	0	0	0
	Dobbs Lane	3	23	-1	0
	A1214 West	25	56	-8	0
7	Northern Arm	1	10	0	-1
	A1214 East	0	0	0	1
	Ropes Drive	0	4	0	0
	A1214 West	2	22	1	0
8	A1214 East	0	1	0	1
	Ropes Drive	-11	0	-6	0
	A1214 West	0	0	0	-1
9	A1214 East	0	0	1	-1
	Bell Lane	25	3	-20	7
	A1214 West	1	0	1	-1
10	Bell Lane	1	0	3	2
	Foxhall Road East	2	3	3	4
	Monument Farm Lane	0	0	0	0
	Foxhall Road West	105	1	-1	1
11	Dobbs Lane	0	2	1	3
	Foxhall Road East	-2	1	2	4
	Hall Road	0	-1	-1	-1
	Foxhall Road West	155	2	1	-2

Figure 12b: Junctions with Queues of Greater than 15 vehicles

Interpretation of results

- 12.7 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 a limited number experiencing a minor increase.
- 12.8 These increases 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.

Junction 12 – Additional Site Access / A12

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

Junction	Scenario 5		Scenario 6	
	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
A12 North	16	21	15	15
Site Access	5	4	5	4
A12 South	9	6	4	6

Figure 12c: Junction 12

12.10 This demonstrates that the junction will operate satisfactorily.

A12 Speed limit reduction

12.11 To determine the impact of reduction of the speed limit, a comparison between Scenarios 5 and 6 has been carried out. This is presented below.

		Scenario 5 Vs Scenario 6	
	Junction	AM (8-9)	PM (5-6)
1	A12	4	3
	Bucklesham Lane	0	0
	A14 East	0	0
	A1156	1	3
	A14 West	0	0
2	A12 North	0	-4
	Newbourne Road	5	0
	A12 South	-3	-2
	Foxhall Road	0	1
3	A12 North	-11	-6
	Barrack Square	0	-3
	Eagle Way	-2	1
	A12 South	-1	5
4	A12 North	1	-2
	Anson Road	2	-2
	A12 South	2	20
	Eagle Way	1	0
5	A12 North	-1	0
	Main Rd East	0	1
	A12 South	1	-1
	Main Rd West	-8	-9
	Park & Ride	0	0
6	A1214 East	0	0
	Dobbs Lane	0	0
	A1214 West	-3	0
7	Northern Arm	0	1
	A1214 East	0	-1
	Ropes Drive	0	0
	A1214 West	0	0
8	A1214 East	0	0
	Ropes Drive	-17	-1
	A1214 West	0	-1
9	A1214 East	0	0
	Bell Lane	22	10
	A1214 West	0	0
10	Bell Lane	0	3
	Foxhall Road East	2	1
	Monument Farm Lane	0	0
	Foxhall Road West	2	1

11	Dobbs Lane	1	1
	Foxhall Road East	1	2
	Hall Road	1	1
	Foxhall Road West	0	0

Figure 12d : Junctions with Queues of Greater than 15 vehicles

- 12.12 This demonstrates that on balance reducing the speed limit on the A12 does not have a material impact.

Assessment Summary

- 12.13 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 Road Network Review – Junction Capacity

Introduction

- 13.1 Through the discussions with SCC, it was agreed that the development could impact on several junctions outside the Paramics model study area. These are to be assessed using traditional software packages, using the traffic flows predicted by the Strategic Saturn Traffic Model.
- 13.2 Priority controlled T-junctions and roundabouts are assessed using the computer software packages JUNCTIONS9, PICADY and ARCADY, respectively, with signal controlled junctions assessed by the LINSIG software package. The junction capacity output of JUNCTIONS9, PICADY and ARCADY refers to the maximum ratio of flow to capacity (RFC), which measures the predicted flow of vehicles against the junction capacity based on the junction geometry, similarly within LINSIG the junction output, junction capacity relates to the Degree of Saturation. Within LINSIG, overall junction capacity is measured as PRC (Practical Reserve Capacity). A PRC of 0.0% or greater indicates the junction can be expected to perform satisfactorily
- 13.3 It is normally accepted that an RFC of 1.000, or a degree of saturation of 100%, indicates that the junction is typically operating at maximum capacity. Due to the inherent day-to-day variability of traffic flows a RFC value of 0.85 or a Degree of Saturation of 90% are seen as acceptable in operational terms for development impact assessments.
- 13.4 JUNCTIONS9, PICADY, ARCADY and LINSIG also report the expected average queues lengths and average delays that may be expected at a junction. This will be reported in the junction assessment results as this provides an indication of the efficiency of a junction's performance.
- 13.5 The locations of the following junctions are shown in Figure 12a.

Junction 13 - A1189 Heath Road / Foxhall Road Roundabout

- 13.6 The existing junction is a simple roundabout with the A1189 Heath Road running North, Foxhall Road running East to West and the A1189 Bixley Road running South, as indicated in Figure 13a:



Figure 13a: A1189 Heath Road / Foxhall Road Roundabout

13.7 The results of the assessment, based on demand flows, as attached in Appendix H, as indicated in Figure 13b.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Heath Road (North)	0.964	20	0.968	21
Foxhall Road (East)	0.916	9	0.961	16
A1189 Bixley Road (South)	0.911	10	0.922	11
Foxhall Road (West)	0.877	7	1.007	29

Figure 13b: JUNCTIONS 9 results – A1189 Heath Road / Foxhall Road Roundabout (2027)

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Heath Road (North)	0.991	31	0.984	28
Foxhall Road (East)	1.072	64	1.052	54
A1189 Bixley Road (South)	0.939	14	0.943	15
Foxhall Road (West)	0.972	18	1.137	108

Figure 13c: JUNCTIONS 9 Results – A1189 Heath Road / Foxhall Road Roundabout (2027+Development)

13.8 The junction has been reviewed to determine the potential improvements that are possible. An improvement has been identified on the following arms that exceeds the capacity threshold:

- **Foxhall Road (East) Approach:** Widen the Entry Width by 1m.
- **Foxhall Road (West) Approach:** Widen the Entry Width by 1m. Increase the Flare Length by 1m

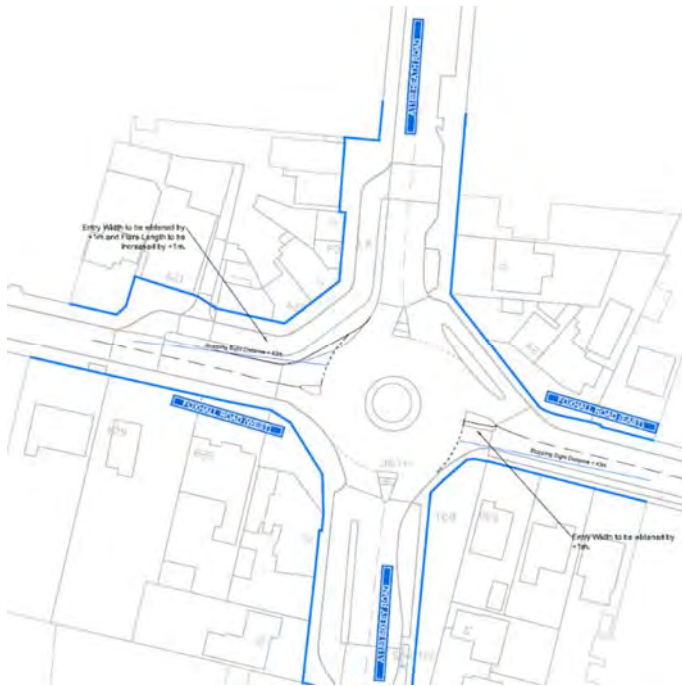


Figure 13d: Mitigation Measures for A1189 Heath Road / Foxhall Road Roundabout

- 13.9 This junction improvement has been assessed to determine the impact of the improvement, with the results presented as follows.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Heath Road (North)	0.940	14	0.956	17
Foxhall Road (East)	0.939	13	0.933	12
A1189 Bixley Road (South)	0.955	17	0.955	17
Foxhall Road (West)	0.858	6	1.001	29

Figure 13e: JUNCTIONS 9 results – Improvements to A1189 Heath Road / Foxhall Road (2027 with Development)

- 13.10 The results demonstrate that the performance of the Design Solution offers Nil Detriment for the majority of the approach arms. However, in some cases such as for Foxhall Road (East) and the A1189 Bixley Road (South), the RFC and Max Queue values still operate slightly higher with the development and mitigation measures in place than without the development or mitigation measures in place. However, it can be seen that with the mitigation measures, Junction Delay reduces or stays the same in both the AM and PM Peak Flow Times as follows:

Modelling Scenario	AM Peak	PM Peak
2027 with Committed Developments	56.61	91.28
2027 with Committed Developments and Development Traffic	73.46	91.56
2027 with Committed Developments, Development Traffic and Junction Improvements	60.42	69.89

Figure 13f: Junctions 9 results – Comparison of Modelling Scenarios for Junction Delay (s)

- 13.11 The results demonstrate that in the PM peak, the junction operates within the capacity offered by the roundabout without the development or mitigation measures in place. The total junction delay is still slightly higher in the AM peak even with the improvements included, however this is an overall increase of less than 5 seconds which is considered negligible. Therefore the suggested improvement offers nil-detriment.
- 13.12 The Road Safety Audit at Stage 1 for this junction has now been undertaken and the Designer's Response is attached in Appendix I.

Junction 14 - A1189 Bixley Road / A1156 Felixstowe Road Roundabout

- 13.13 The existing junction is a simple roundabout with the A1189 Bixley Road running North, Bucklesham Road running East, and the A1156 Felixstowe Road running from south to west as indicated in Figure 13g:



Figure 13g: A1189 Bixley Road / A1156 Felixstowe Road Roundabout

- 13.14 The results of the assessment, based on demand flows, as attached in Appendix H, as indicated in Figure 13h.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Bixley Road (North)	0.988	26	0.838	9
Bucklesham Road	0.787	4	0.910	10
A1156 Felixstowe Road (South)	0.909	12	0.994	56
A1156 Felixstowe Road (West)	0.826	12	0.817	17

Figure 13h: JUNCTIONS 9 results – A1189 Bixley Road / A1156 Felixstowe Road Roundabout (2027)

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Bixley Road (North)	0.978	35	0.857	13
Bucklesham Road	0.884	4	0.930	14
A1156 Felixstowe Road (South)	0.918	18	0.984	58
A1156 Felixstowe Road (West)	0.840	14	0.804	21

Figure 13i: JUNCTIONS 9 Results – A1189 Bixley Road / A1156 Felixstowe Road Roundabout (2027+Development)

- 13.15 The junction has been reviewed to determine the potential improvements that are possible. An improvement has been identified on the following arms that exceeds the capacity threshold:

- **A1189 Bixley Road (North):** Widen the Entry Width by 0.3m.

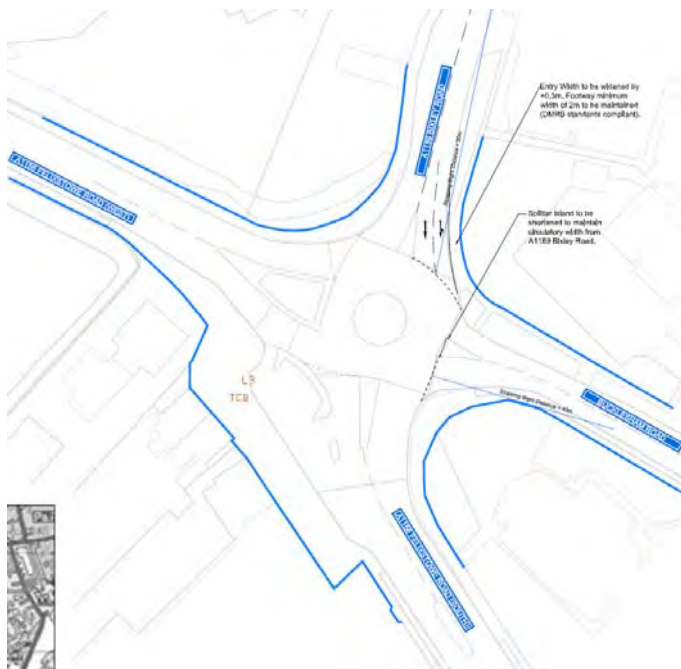


Figure 13j: Mitigation Measures for A1189 Bixley Road / A1156 Felixstowe Road Roundabout

- 13.16 This junction improvement has been assessed to determine the impact of the improvement, with the results presented as follows.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1189 Bixley Road (North)	0.947	25	0.832	7
Bucklesham Road	0.785	5	0.921	11
A1156 Felixstowe Road (South)	0.905	14	0.962	28
A1156 Felixstowe Road (West)	0.837	17	0.830	21

Figure 13k: JUNCTIONS 9 results – Improvements to A1189 Bixley Road / A1156 Felixstowe Road Roundabout (2027 with Development)

- 13.17 The results demonstrate that in both the AM and PM peaks, the junction operates within the capacity offered by the roundabout without the development or mitigation measures in place. Therefore the suggested improvement offers nil-detriment.
- 13.18 The Road Safety Audit at Stage 1 for this junction has now been undertaken and the Designer's Response is attached in Appendix I.

Junction 15 - A1214 / A1189 Gyratory Junction

- 13.19 The existing junction is a gyratory junction roundabout with the A1214 Colchester Road running from West to East into A1214 Woodbridge Road, the A1071 Woodbridge Road running South-East, the Ipswich Hospital Access to the South and the A1189 Heath Road running South-East as indicated in Figure 13l:



Figure 13l: A1214 / A1189 Gyratory Junction

13.20 The results of the assessment, based on demand flows, as attached in Appendix H, as indicated in Figure 13m.

Link	AM Peak		PM Peak	
	Degree of Saturation	Mean Max Queue	Degree of Saturation	Mean Max Queue
Ipswich Hospital	6.8%	0	15.1%	0
A1071 Woodbridge Road (West)	71.2%	2	70.3%	6
A1214 Colchester Road (West)	62.1%	1	61.5%	1
A1214 Woodbridge Road (East)	68.5%	13	60.8%	8
A1189 Heath Road	90.2%	31	98.4%	50

Figure 13m: LINSIG results – A1214 / A1189 Gyratory Junction (2027)

Link	AM Peak		PM Peak	
	Degree of Saturation	Mean Max Queue	Degree of Saturation	Mean Max Queue
Ipswich Hospital	7.1%	0	15.4%	0
A1071 Woodbridge Road (West)	79.6%	9	79.6%	9
A1214 Colchester Road (West)	66.6%	1	66.0%	1
A1214 Woodbridge Road (East)	78.2%	25	62.6%	10
A1189 Heath Road	107.7%	119	127.7%	167

Figure 13n: LINSIG Results – A1214 / A1189 Gyratory Junction (2027+Development)

13.21 The junction has been reviewed to determine the potential improvements that are possible. An improvement has been identified on the following arms that exceeds the capacity threshold:

- **A1189 Heath Road:** Eastern Roundabout to be realigned so that the Entry Width from Heath Road can be increased to provide a queuing length of 18m;
- **Western Roundabout:** Reinstate full movements at the Western Roundabout to remove U-turns from Eastern Roundabout.

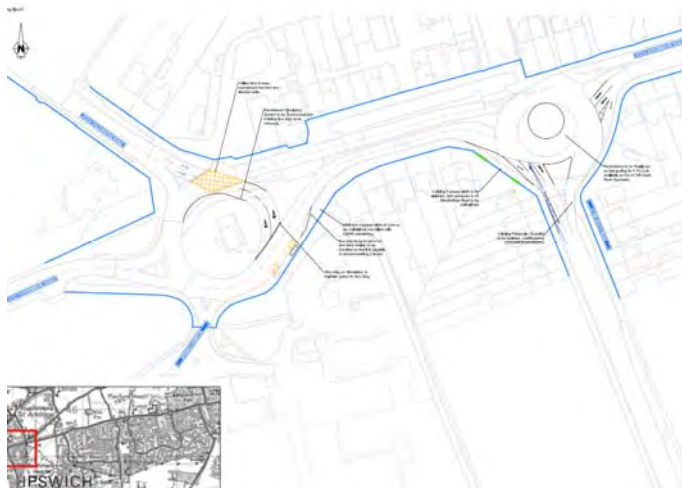


Figure 13o: Mitigation Measures for A1214 / A1189 Gyratory Junction

- 13.22 This junction improvement has been assessed to determine the impact of the improvement, with the results presented as follows.

Link	AM Peak		PM Peak	
	Degree of Saturation	Mean Max Queue	Degree of Saturation	Mean Max Queue
Ipswich Hospital	7.2%	0	15.6%	0
A1071 Woodbridge Road (West)	80.6%	5	80.9%	10
A1214 Colchester Road (West)	66.6%	1	66.0%	1
A1214 Woodbridge Road (East)	74.6%	19	62.1%	10
A1189 Heath Road	89.4%	31	93.6%	44

Figure 13p: LINSIG results – Improvements to A1214 / A1189 Gyratory Junction (2027 with Development)

- 13.23 The results demonstrate that in both the AM and PM peaks, the junction operates within the capacity offered by the roundabout without the development or mitigation measures in place. Therefore the suggested improvement offers nil-detriment.
- 13.24 The Road Safety Audit at Stage 1 for this junction has now been undertaken and the Designer's Response is attached in Appendix I.

A14 / A12 Copdock Interchange

- 13.25 The existing grade-separated junction is a major interchange in the East of England Region for traffic travelling towards the Midlands and London from the East Coast Port of Felixstowe. It is a large signalised roundabout with the A14 Ipswich Bypass running from West to East with the A12 London to Lowestoft Road running South-west and the A1214 London Road running North-east as indicated in Figure 13q:



Figure 13q: A14 / A12 Copdock Interchange

13.26 The results of the assessment, based on demand flows, as attached in Appendix H, as indicated in Figure 13r.

Link	AM Peak		PM Peak	
	Degree of Saturation	Mean Max Queue	Degree of Saturation	Mean Max Queue
A14 Ipswich Bypass (West)	91.1%	12	92.1%	15
A14 Ipswich Bypass (West) Circulatory	83.9%	23	93.6%	23
A1214 London Road (North)	90.5%	22	81.1%	13
A1214 London Road Circulatory	78.2%	20	70.6%	17
A14 Ipswich Bypass (East)	92.0%	14	85.7%	14
A14 Ipswich Bypass (East) Circulatory	87.7%	23	88.5%	21
A12 London to Lowestoft Road	88.1%	20	93.6%	24
A12 London to Lowestoft Road Circulatory	81.6%	12	85.7%	12

Figure 13r: LINSIG results – A14 / A12 Copdock Interchange (2027)

Link	AM Peak		PM Peak	
	Degree of Saturation	Mean Max Queue	Degree of Saturation	Mean Max Queue
A14 Ipswich Bypass (West)	86.6%	11	94.8%	18
A14 Ipswich Bypass (West) Circulatory	88.9%	25	93.6%	23
A1214 London Road (North)	90.7%	22	81.3%	13
A1214 London Road Circulatory	79.1%	21	71.8%	19
A14 Ipswich Bypass (East)	92.5%	16	86.0%	14
A14 Ipswich Bypass (East) Circulatory	87.2%	21	88.5%	21
A12 London to Lowestoft Road	88.1%	20	93.6%	24
A12 London to Lowestoft Road Circulatory	81.6%	12	86.0%	12

Figure 13s: LINSIG Results – A14 / A12 Copdock Interchange (2027+Development)

- 13.27 This therefore shows that even without the development, the junction in its existing layout is operating over capacity. The change in the efficiency of the junction due to the additional traffic generated by the proposed development is demonstrated to be negligible.
- 13.28 In addition, the majority of the flows generated by the development are flowing along the A14 Ipswich Bypass which is grade-separated from the roundabout.
- 13.29 A total of 89 additional trips are generated through this junction by the development in the AM Peak. The total number of trips through this junction is 7319 when all other developments are included in the year 2027. A breakdown of these is as follows:
- 3 additional trips are generated to the A1214 southbound turning into the A14 Eastbound;
 - 2 additional trips are generated to the A14 Westbound turning into the A1214 northbound;
 - 51 additional trips are generated to the A14 Westbound turning into the A12 Southbound;
 - 33 additional trips are generated to the A12 Northbound turning into the A14 Eastbound.
- 13.30 A total of 81 additional trips are generated through this junction by the development in the PM Peak. The total number of trips through this junction is 7526 when all other developments are included in the year 2027. A breakdown of these is as follows:
- 1 additional trips are generated to the A1214 southbound turning into the A14 Eastbound;
 - 2 additional trips are generated to the A14 Westbound turning into the A1214 northbound;
 - 34 additional trips are generated to the A14 Westbound turning into the A12 Southbound;
 - 44 additional trips are generated to the A12 Northbound turning into the A14 Eastbound.
- 13.31 All of these additional flows equate to less than one vehicle per minute. In accordance with NPPF, Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe. An increase of flows equating to less than a minute during peak flow times cannot be considered to be severe.
- 13.32 Therefore these additional flows will not affect the efficiency of the junction and hence, no improvements are considered necessary to the junction.

Junction Assessment Results

- 13.33 Worst case results in the peak periods are summarised below, showing the junctions that operate above the normally accepted thresholds of capacity. Additional information is included in the Appendix regarding the individual junction assessments. Potential site access junctions were also assessed with these operating within capacity.

Junction	Base Line	2027 with Committed Developments	2027 with Committed Developments and Proposed Site
A1189 Heath Road / Foxhall Road Roundabout	RFC = 0.896	RFC = 1.007	RFC = 1.137
A1189 Bixley Road / A1156 Felixstowe Road Roundabout	RFC = 0.932	RFC = 0.994	RFC = 0.984
A1214 / A1189 Gyratory Junction	✓	DOS = 98.4%	DOS = 127.7%
A14 / A12 Copdock Interchange	DOS = 81.1%	DOS = 93.6%	DOS = 94.8%

Figure 13t: Junction summary maximum RFC predicted when junction is over capacity

- 13.34 The results of the junction assessments indicate that the majority of junctions operate within capacity. However, some of the junctions are predicted to operate over capacity. It should be noted, however, that these junctions are predicted to operate over capacity in the base year without the inclusion of the generated traffic from the proposed development at

Adastral Park in Martlesham near Ipswich. To facilitate development, it will be necessary to mitigate the impact of the development at the following locations.

- **A1189 Heath Road / Foxhall Road Roundabout:** Foxhall Road East Approach to be widened by 1m on entry width, and Foxhall Road West Approach to be widened by 1m on entry width and 1m on flare length.
- **A1189 Bixley Road / A1156 Felixstowe Road Roundabout:** Bixley Road Approach to be widened by 0.3m on entry width.
- **A1214 / A1189 Gyratory Junction:** Eastern Roundabout to be realigned so that the Entry Width from Heath Road can be increased to provide a queuing length of 18m. Reinstate full movements at the Western Roundabout to remove U-turns from Eastern Roundabout.

Road Network Interventions

- 13.35 The junctions identified above have been reviewed to determine the extent of mitigation required to deliver improvement solutions, as follows.

<i>Junction</i>	<i>Existing</i>	<i>Future No Mitigation</i>	<i>Future with Mitigation</i>
A1189 Heath Road / Foxhall Road Roundabout	✓	✗	✓
A1189 Bixley Road / A1156 Felixstowe Road Roundabout	✓	✗	✓
A1214 / A1189 Gyratory Junction	✓	✗	✓

Figure 13u: Junction summary maximum RFC predicted when junction is over capacity

- 13.36 The improvements are typical in scale and nature to that needed for a development of that proposed, which are minor alterations to kerbs and white lines that provide increased traffic capacity. All the improvements can be delivered within Highway land.

Junctions and Link Assessment Summary

- 13.37 Those junctions most likely to be effected by the Adastral Park site have been assessed. The result of the assessment indicates that the junctions that operate over the future capacity levels with the inclusion of the development, will need to be improved. This assessment is based on the agreed modelling methodology.
- 13.38 A range of interventions have been identified that will ensure that this development can be delivered such that the road network will still operate within acceptable limits.

14 Limitations

- 14.1 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.
- 14.2 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.
- 14.3 The benefits of this report are provided to Carlyle Land and Commercial Estates Group for the proposed development on land at Adastral Park.
- 14.4 Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A – Scoping Note

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

Transport Assessment Scoping Note

Carlyle Land Ltd and Commercial Estates Group

Document Control Sheet

Document Title: Transport Statement Scoping Note

Document Ref: 10391/SR/01

Project Name: Land South and East of Adastral Park, Ipswich

Project Number: 10391

Client: Carlyle Land Ltd and Commercial Estates Group

Document Status

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Appendix

Appendix A – Trip Rates

1 Introduction

- 1.1 This Transportation Scoping Note has been prepared by Brookbanks Consultants Ltd on behalf of CEG for a proposed mixed use development on land South and East of Adastral Park, Ipswich.
- 1.2 The broad location of the Adastral Park is indicated below.

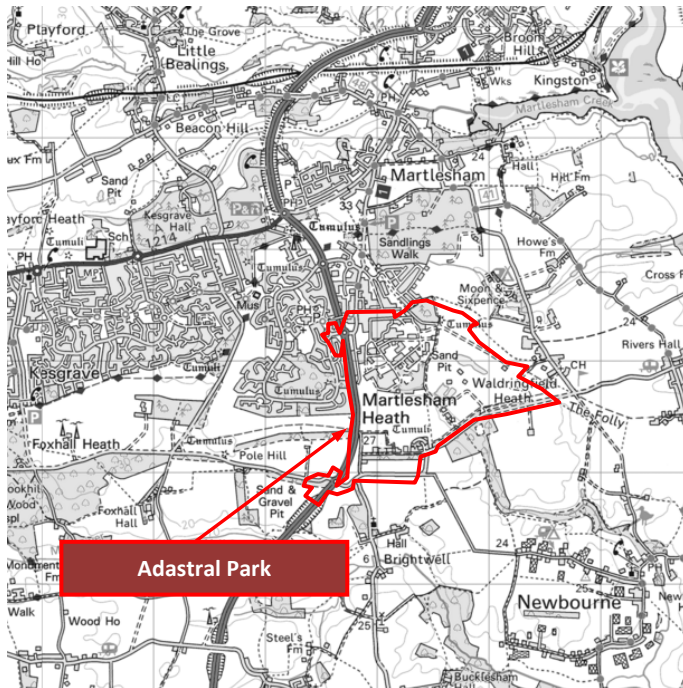


Figure 1a: Site location

- 1.3 Following initial discussions with Suffolk County Council, (SCC) this note sets out the scope for a Transport Assessment which is to be undertaken in due course to demonstrate the viability of the site in transport terms to support a residential development.
- 1.4 The Transport Assessment (TA) will follow the broad structure as detailed below;

Executive Summary

Chapter 1: Introduction

Chapter 2: Background Information

Chapter 3: Policy and Design Guidance Review

Chapter 4: Baseline conditions

Chapter 5: Development Proposals

Chapter 6: Site accessibility

Chapter 7: Travel Plan

Chapter 8: Traffic Generation

Chapter 9: Global Paramics Statistics

Chapter 10: Highway Network Review - Journey Times

Chapter 11: Highway Network Review - Link Capacity

Chapter 12: Highway Network Review - Junction Queues

Chapter 13: Mitigation Strategy

- 1.5 The following chapters in this note provide a framework for the information to be included within the chapters to be included within the TA.

- 1.6 The site was subject to a previous planning application which considered the delivery of a similar mixed use development. The application was supported by a TA, with the document being discussed and agreed with SCC. The overarching principles previously agreed by SCC will be adopted within this assessment where appropriate.

2 Background Information

- 2.1 This chapter will provide the high level of review of the site location in relation to the general highway network, identify the broad development quantum and will identify the general structure of the TA.
- 2.2 This chapter will confirm the development quantum. At the time of writing it is envisaged that the development will deliver a range of housing of mixed type and tenure, local centre, education provision and employment.

Scheme Proposals

- 2.3 It is proposed to develop the site for a new development delivering residential use together supporting commercial and educational land uses. At the time of writing, with the final quantum and details of development are yet to be finalised. The Proposed Development is likely to comprise the delivery of the following land uses:

- 2,000 Dwellings
- Employment area of circa 0.6ha (use Class B1)
- Primary local centre (comprising use Classes A1, A2, A3, A4, A5, B1, C3, D1 and D2)
- Secondary centre (comprising possible use Classes A1, A3 and A5)
- School
- Green infrastructure (including Suitable Accessible Natural Green Space (SANGS))
- Outdoor play areas
- Aports ground and allotments/community orchards)
- Public footpaths and cycleways
- Vehicle accesses and associated infrastructure

- 2.4 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.

Previous Application History

- 2.5 An Outline Planning Application was sought for the site previously by David Lock Associates on behalf of British Telecom (BT) in April 2009. Their proposal's included:
- Upgrades to existing employment floorspace and the creation of up to 60,000 sq.m of new employment floorspace;
 - A residential community of up to 2,000 new homes alongside Adastral Park;
 - Comprehensive infrastructure and services to serve the new community including new education and healthcare provision, public transport, shops, leisure and sport facilities and public spaces;
 - A hotel;
 - An on-site energy centre to provide renewable heat and power;
 - Improvement of local infrastructure including an A12 access;
 - An expansion of the university presence at Adastral Park.
- 2.6 Integrated Transport Planning prepared the Transport Assessment and Travel Plan for said planning application, together with an Environmental Assessment for the site.

3 Policy and Design Guidance Review

- 3.1 Local and regional policies regarding the development of new sites within Ipswich will be presented and interpreted in respect of the proposed site. The suitability of the site in the context of these policies will be assessed.
- 3.2 This will include a review of the following documents:
- National Planning Policy Framework
 - Design Manual for Road and Bridges
 - Manual for Streets
 - Local Plan
 - Relevant Local Plan saved policies
 - Local Transport Plan
- 3.3 The Masterplan, access and parking strategy shall refer to and make full use of the Design Manual for Roads and Bridges (DMRB), Manual for Streets Parts 1 and 2, the Suffolk Design Guide and the Suffolk Guidance for Parking.
- 3.4 Both National and Local Planning Policy Guidance will be reviewed in the preparation of the Transport Assessment and the accompanying Travel Plan. The Suffolk County Council team will be contacted to discuss relevant matters.

4 Baseline Conditions

- 4.1 A detailed review of the site location will be provided.
- 4.2 Existing conditions in the vicinity of the site will be described with reference to the layout, function and operation of the local transport network, for all modes of movement. This will include a review of the networks:
- Current highway network
 - Road and rail based public transport facilities / routes
 - Walking and cycling networks
 - Public rights of way adjacent to the site
- 4.3 Any existing barriers or constraints to sustainable movement will be identified, investigated and described.
- 4.4 It is proposed that a review of historical accidents over the past five years is to be carried out using the latest available data to identify any recurring patterns that may indicate a need for further investigation or for remedial measures to address the situation.
- 4.5 The accident study area is identified below.



Figure 4a: Accident study area

5 Development Proposals

- 5.1 This chapter will describe in detail the scheme proposals, which includes the potential to deliver circa 2,000 dwellings supported by ancillary land uses that include a local centre, employment and education land uses.
- 5.2 The chapter will explain how the development will coalesce with the existing wider Adastral Park development and provide a draft timescale for the delivery of the development. At the time of writing it is expected that the planning application will be submitted in 2017, with the first occupation in 2019.
- 5.3 To the west of the site, the A12 borders the site. The previous application considered the delivery of two access points onto the A12. This application will consider the potential to deliver three access points. This chapter will provide an indication of the phasing.
- 5.4 The masterplan for the development will be presented which will highlight the access strategy for walking, cycling and vehicular.
- 5.5 Through discussions with SCC, there is an aspiration to reduce the speed limit along the A12. This will be reviewed through the TA.
- 5.6 The design of the internal site layout will use Manual for Streets (MfS) philosophy. Parking for the site overall will be provided at an appropriate level with regard to maximum standards and consistent with local standards.
- 5.7 A description of the network of pedestrians and cycle routes will be provided. This will include a 3m wide route through the site that will connect to the external networks.
- 5.8 The level of public transport enhancements proposed to support the development will be indicated. This will be guided by discussions with local operators.

6 Site Accessibility

- 6.1 This chapter will assess the development in relation to accessibility. The location and accessibility, by all modes, of community facilities, schools and other local trip generators will be identified and assessed in relation to the proposed site. This will identify key facilities including:
- Key employment opportunities
 - Retail destinations
 - Education
 - Health
 - Leisure
- 6.2 The accessibility of the site will be reviewed in line with 2km and 5km maximum isochrones for trips to be made by walking and cycling.
- 6.3 The Transport Assessment will provide an audit of the site accessibility to key trip attractors, including this proposed in the masterplan.
- 6.4 The Transport Assessment will also consider the likelihood of future residents to travel by sustainable modes of transport to trip attractors' land use, for example employment, education, leisure and health. The Transport Assessment will estimate the length of travel to health or shopping facilities that residents would be willing to travel to by sustainable modes of transport.
- 6.5 The potential site accessibility shall be compared or related to the existing public transport services and highway network.

7 Travel Plan

- 7.1 The development will deliver different land uses, including residential, employment and education. A framework travel plan for each land use will be provided. The proposed targets and measures will be identified in accordance with Local and National Planning Guidance, and agreed with Suffolk County Council.
- 7.2 The website provided by Suffolk County Council: <http://www.greensuffolk.org/travel/travel-plan-support/developer-support/> provides appropriate guidance to achieve a successful scheme which encourages the use of sustainable modes of transport.
- 7.3 This chapter will provide details on the Travel Plan that has been drafted to support this development including any measures that can be utilised to achieve the necessary modal shift. Suffolk Guidance on Travel Plans suggests that an effective residential travel plan should reduce commuter car usage between 11% and 21%. This will become the overarching travel plan target
- 7.4 The benefit of the Travel Plan will be assessed as a sensitivity test only, in order to provide a more robust assessment of the traffic generation and the impact of the development.

8 Traffic Generation

- 8.1 This chapter will present the agreed methodology adopted to assess the development impacts.

Traffic Modelling Methodology

8.2 Through the previous application and validated and calibrated Paramics micro-simulation traffic model was produced. The discussions with SCC have confirmed that the use of the traffic model is recommended. This includes details on:

- Method to re-validate the base model
- Interaction with the Saturn model
- Method to factor to future year scenarios
- Agreed committed developments
- Trip generation

8.3 The strategic and local road network will be addressed and summarised in the forthcoming Transport Assessment. Key destinations from the site will also be addressed.

Transport Assessment Scope

8.4 The proposed extent of the Paramics model is identified below. This provides further coverage than what was previous assessed.

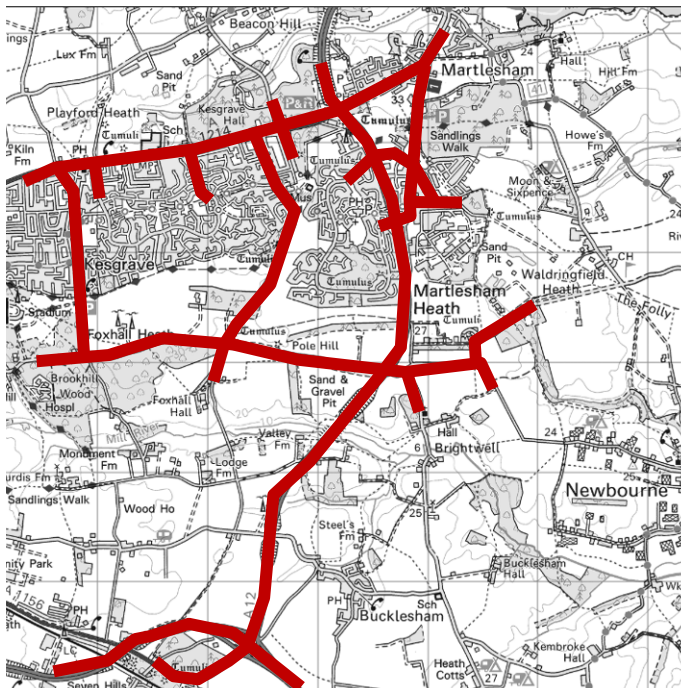


Figure 8a: Traffic Study area

- 8.5 In addition to this, a manual assessment of the Copdock Interchange will be carried out.
- 8.6 Through discussions with SCC, it has been identified that the development could have a wider impact outside the Paramics study area. Therefore, it has been agreed that SCC will provide outputs from the Strategic Traffic model to assess further locations.

Assessment Years

8.7 The application is expected to be submitted in spring 2017, with consent given later that year. Therefore, the traffic years to considered are, subject to agreement with Suffolk County Council:

- 2017
- 2027

8.8 Details of the phasing of the development will be provided in the Transport Assessment, ultimately to confirm that the development will be constructed over a ten year period.

Committed Developments

8.9 Committed development in the wider Ipswich Area will be included in the traffic flow modelling, subject to agreement with Suffolk County Council.

Traffic Scenarios

8.10 The Paramics model will be used to assess the impacts of development. On the assumption that the development will be built out over a ten year period, the model runs that are likely to be required are:

- Validated base year 2017 (**Base Year**)
- Future Year (**Base Future Year**)
- Future year plus committed developments 2027 (**Do Nothing**)
- Future year plus committed development plus development 2027 (**Do Minimum**)
- Future year plus committed development plus development 2027 with mitigation (**Do Something**)

8.11 The development will be phased over a number of years, together with the mitigation. Therefore, in addition to the main test identified above further interim tests will be carried out. These will assist in identifying the delivery of the access points and off site interventions.

8.12 Sensitivity tests will be carried out on the model to account for the development phasing and to identify when it may be appropriate to introduce physical mitigation measures on the network.

Previous Mitigation

8.13 The previous assessment identified a range of highway interventions. These will be assessed through the modelling process to identify need / timing. The previously identified mitigation measures are:

- A12 / A14 Levington Seven Hills Interchange – partial signalisation and localised widening
- A12 / Foxhall Road / Newbourne Road – conversion to signalised crossroads
- A12 / Barrack Square / Eagle Way – conversion to signalised junction
- A12 / Anson Road / Eagle Way – conversion to signalised crossroads
- A12 / A1214 – optimised signal timings
- Gloster Road / Barrack Square – conversion to signalised junction

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.

8.15 The Trics outputs and a Technical Note providing supporting information are contained in Appendix A and illustrated below.

8.16 The resultant total external trip generation is presented below.

Time Periods	Housing		Primary School		Employment	
	IN	OUT	In	Out	In	Out
0700–0800	148	514	17	5	88	19
0800-0900	290	724	91	63	222	40
0900-1000	276	344	11	19	104	31
1600-1700	556	346	18	31	37	119
1700-1800	664	396	10	15	27	177
1800-1900	470	342	6	8	17	68

Figure 8b: Resultant external trips

9 Global Paramics Statistics

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 in terms of total time and total distance travelled by all vehicles that completed a journey during the model simulation period.
- **Completed Trips (vehicles):** The number of completed trips recorded in terms of total vehicles and average distance per vehicle during the model simulation.

9.2 The first two measurements are averages so can be used to compare between the various scenarios. The final measurement is an absolute and is dependent on congestion on the network (as this will prevent trips from completing) and the demand within the model (i.e. the number of trips actually trying to complete). As demand differs between scenarios, as well as small variations between runs of the same scenario, we cannot expect the number of completed trips to be the same. However, as the demands do not differ significantly it can still provide an indication of the relative congestion on each network.

10 Highway Network Review - Journey Times

10.1 The difference in Journey Times will be assessed by the following criteria. The route reporting a moderate increase in journey times will be reviewed in detail.

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

Figure 9a: Impact assessment

10.2 Any significant reduction of the journey time will be reviewed in order to understand the possible rerouting and changes in the delays on the network.

10.3 The journey time and distance graph will be used to define the location of the delays.

11 Highway Network Review - Link Capacity

- 11.1 This chapter will review the output from the Paramics modelling work in relation to link flows. To assess the significance of the difference between the scenarios with and without the development, a percentage impact will be used to compare to sets of model data.
- 11.2 Where the difference with and without the development shows a percentage impact of greater than 10% in terms of flow, each link shall be reviewed in greater detail with respect to network summary statistics. This shall be terms of volume of traffic in comparison to highway capacity. DMRB standard TA 79/99 Traffic Capacity of Urban Roads shall be made reference to throughout.

12 Highway Network Review - Junction Queues

- 12.1 Queue length analysis is intended to provide a more detailed picture of the impacts at specific junctions within the model network. The difference in queues will be assessed against the following criteria.

Rating	Score
Mean Maximum Queue Length of 0 or less than 5 vehicles	
Negligible increase with a difference between 5 and 10 vehicles	
Minor increase with a difference between 10 and 20 vehicles	
Moderate Increase with a difference between 20 and 50 vehicles	
Major Increase with a difference greater than 50 vehicles	

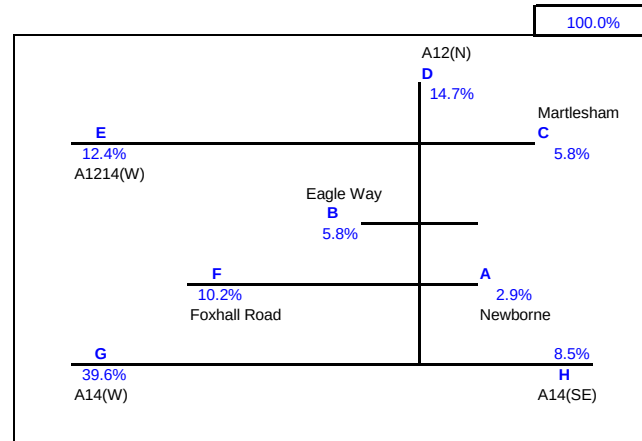
13 Mitigation Strategy

- 13.1 This chapter will summarise the mitigation strategy in order to deliver a sustainable development, including walking, cycling, public transport and the road network.
- 13.2 Overall impacts of the development on the highway network will be considered in conjunction with total network statistics in terms of network mean delay, average speed, completed trips, journey times, link capacity and junction queues. This shall be used in determining if mitigation measures are necessary.

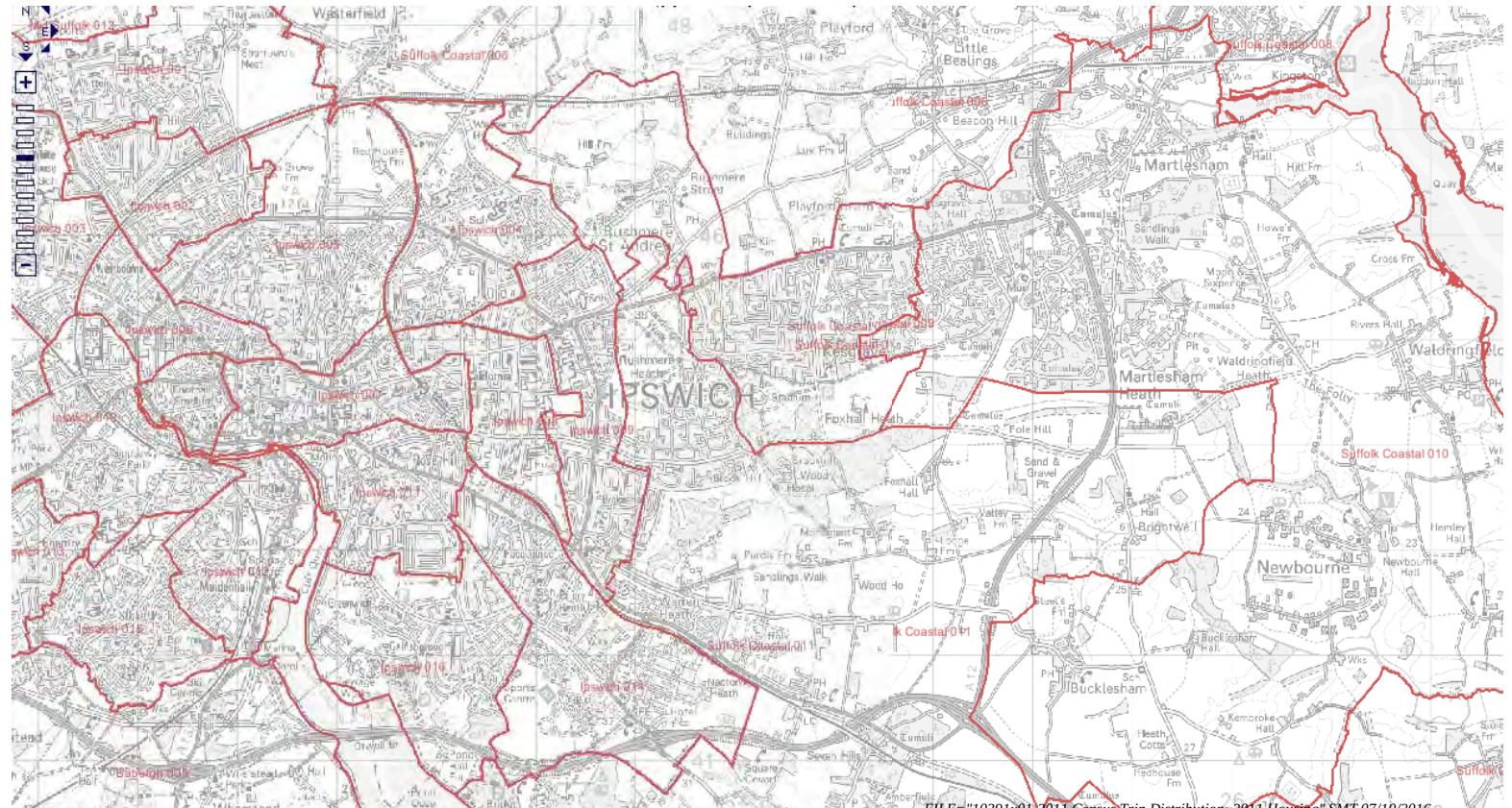
Client:	Client	Prepared by: S.M.T.	Brookbanks
Job:	10391 Adastral Park	07/10/2016	Consulting
Title:	2011 Census Travel to Work Trip Distribution - Housing	Figure 1	© Brookbanks Consulting Limited 2016

for Output Area: **Suffolk Coastal 010**

		Description
2.9%	118	A Newborne
5.8%	237	B Eagle Way
5.8%	237	C Martlesham
14.7%	599	D A12(N)
12.4%	505	E A1214(W)
10.2%	416	F Foxhall Road
39.6%	1608	G A14(W)
8.5%	345	H A14(SE)
100.0%	4065	Total trips assigned
	0	Still to be assigned



place of work : 2011 super output area -	Car - drivers	Dest Letter	percentage of SOA	4065
E02006296 Suffolk Coastal 010	592	A	20%	118
E02006296 Suffolk Coastal 010	592	B	40%	237
E02006296 Suffolk Coastal 010	592	C	40%	237
E02005597 South Norfolk 001	2	D	100%	2
E02005598 South Norfolk 002	3	D	100%	3
E02005599 South Norfolk 003	1	D	100%	1
E02005601 South Norfolk 005	1	D	100%	1
E02005602 South Norfolk 006	1	D	100%	1
E02005603 South Norfolk 007	2	D	100%	2
E02005604 South Norfolk 008	2	D	100%	2
E02005608 South Norfolk 012	1	D	100%	1
E02005611 South Norfolk 015	2	D	100%	2
E02006287 Suffolk Coastal 001	1	D	100%	1
E02006288 Suffolk Coastal 002	33	D	100%	33
E02006289 Suffolk Coastal 003	28	D	100%	28
E02006290 Suffolk Coastal 004	57	D	100%	57
E02006291 Suffolk Coastal 005	75	D	100%	75
E02006292 Suffolk Coastal 006	47	D	100%	47
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E02006294 Suffolk Coastal 008	242	D	100%	242
E02006302 Waveney 001	1	D	100%	1
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E02006312 Waveney 011	1	D	100%	1
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E02006314 Waveney 013	2	D	100%	2
E02006315 Waveney 014	1	D	100%	1
E02006316 Waveney 015	3	D	100%	3
E02006245 Ipswich 001	12	E	100%	12
E02006246 Ipswich 002	29	E	100%	29
E02006247 Ipswich 003	73	E	100%	73
E02006248 Ipswich 004	51	E	100%	51
E02006249 Ipswich 005	29	E	100%	29



E02006250	Ipswich 006	63	E	100%	63
E02006267	Mid Suffolk 007	20	E	100%	20
E02006271	Mid Suffolk 011	64	E	100%	64
E02006272	Mid Suffolk 012	35	E	100%	35
E02006295	Suffolk Coastal 009	129	E	100%	129
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E02006253	Ipswich 009	246	F	100%	246
E02006297	Suffolk Coastal 011	77	F	100%	77
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E02000020	Barking and Dagenham 019	1	G	100%	1
E02000092	Bexley 028	1	G	100%	1
E02000144	Bromley 018	1	G	100%	1
E02000217	Croydon 024	1	G	100%	1
E02000286	Enfield 010	1	G	100%	1
E02000365	Hackney 021	1	G	100%	1
E02000371	Hackney 027	1	G	100%	1
E02000397	Haringey 001	1	G	100%	1
E02000433	Harrow 001	1	G	100%	1
E02000470	Havering 007	2	G	100%	2
E02000530	Hounslow 005	1	G	100%	1
E02000736	Newham 023	1	G	100%	1
E02000759	Redbridge 009	1	G	100%	1
E02000767	Redbridge 017	1	G	100%	1
E02000806	Richmond upon Thames 023	1	G	100%	1
E02000881	Tower Hamlets 018	1	G	100%	1
E02000890	Tower Hamlets 027	1	G	100%	1
E02000970	Westminster 011	1	G	100%	1
E02001326	Wigan 040	1	G	100%	1
E02001335	Knowsley 009	1	G	100%	1
E02001460	Sefton 032	1	G	100%	1
E02001797	Sunderland 007	1	G	100%	1
E02002235	Bradford 053	1	G	100%	1
E02002336	Leeds 007	1	G	100%	1
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E02002904	Nottingham 037	1	G	100%	1
E02003027	Bristol 016	1	G	100%	1
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E02003223	Swindon 012	1	G	100%	1
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E02003275	Luton 018	3	G	100%	3
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E02003312	Thurrock 017	2	G	100%	2
E02003377	West Berkshire 011	1	G	100%	1
E02003432	Windsor and Maidenhead 012	1	G	100%	1
E02003456	Wokingham 018	1	G	100%	1
E02003472	Milton Keynes 014	1	G	100%	1
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E02003710	Wycombe 015	1	G	100%	1
E02003714	Wycombe 019	1	G	100%	1
E02003721	Cambridge 003	3	G	100%	3
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E02003730	Cambridge 012	1	G	100%	1
E02003731	Cambridge 013	1	G	100%	1
E02003762	Huntingdonshire 010	2	G	100%	2
E02003763	Huntingdonshire 011	1	G	100%	1
E02003777	South Cambridgeshire 003	1	G	100%	1
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E02003791	South Cambridgeshire 017	3	G	100%	3
E02003792	South Cambridgeshire 018	2	G	100%	2
E02003920	Cornwall 049	1	G	100%	1
E02004162	Exeter 014	1	G	100%	1
E02004306	County Durham 020	1	G	100%	1
E02004433	Basildon 010	1	G	100%	1
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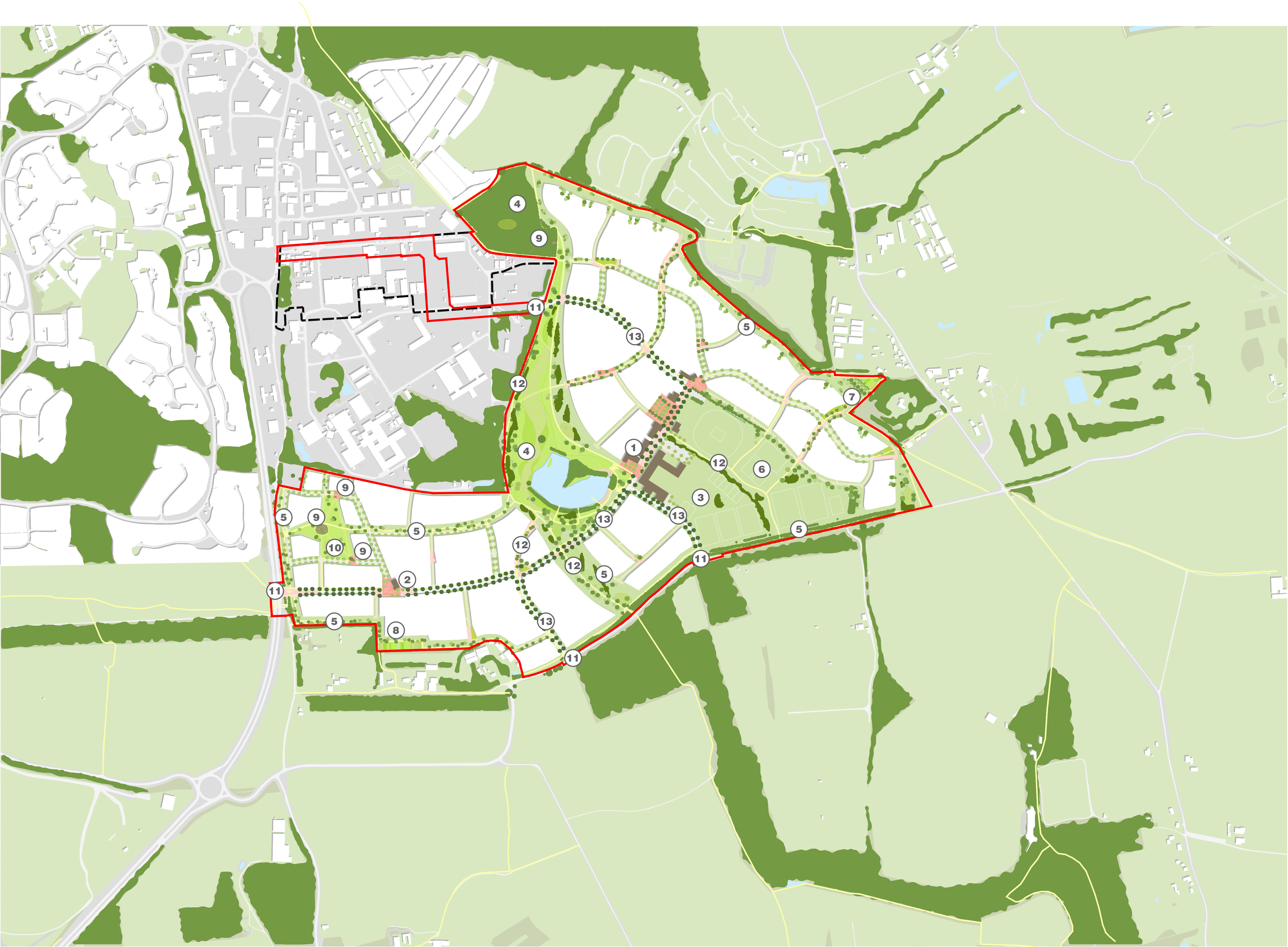


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E02004447	Braintree 002	1	G	100%	1
E02004451	Braintree 006	3	G	100%	3
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E02004470	Brentwood 007	1	G	100%	1
E02004489	Chelmsford 005	3	G	100%	3
E02004491	Chelmsford 007	1	G	100%	1
E02004493	Chelmsford 009	1	G	100%	1
E02004494	Chelmsford 010	6	G	100%	6
E02004497	Chelmsford 013	1	G	100%	1
E02004506	Colchester 001	3	G	100%	3
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E02004509	Colchester 004	6	G	100%	6
E02004512	Colchester 007	20	G	100%	20
E02004513	Colchester 008	4	G	100%	4
E02004514	Colchester 009	2	G	100%	2
E02004515	Colchester 010	2	G	100%	2
E02004516	Colchester 011	2	G	100%	2
E02004517	Colchester 012	4	G	100%	4
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E02004522	Colchester 017	4	G	100%	4
E02004524	Colchester 019	3	G	100%	3
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E02004547	Harlow 004	1	G	100%	1
E02004556	Maldon 002	3	G	100%	3
E02004557	Maldon 003	1	G	100%	1
E02004558	Maldon 004	1	G	100%	1
E02004560	Maldon 006	1	G	100%	1
E02004562	Maldon 008	1	G	100%	1
E02004573	Tendring 001	5	G	100%	5
E02004574	Tendring 002	3	G	100%	3
E02004575	Tendring 003	4	G	100%	4
E02004577	Tendring 005	2	G	100%	2
E02004579	Tendring 007	4	G	100%	4
E02004581	Tendring 009	1	G	100%	1
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E02004583	Tendring 011	2	G	100%	2
E02004586	Tendring 014	3	G	100%	3
E02004591	Uttlesford 001	1	G	100%	1
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E02004595	Uttlesford 005	1	G	100%	1
E02004596	Uttlesford 006	2	G	100%	2
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E02004756	Hart 006	1	G	100%	1
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E02004808	Rushmoor 007	2	G	100%	2
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E02004966	Three Rivers 011	1	G	100%	1
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E02004990	Welwyn Hatfield 011	1	G	100%	1
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E02005363	Charnwood 019	1	G	100%	1
E02005390	Hinckley and Bosworth 014	1	G	100%	1
E02005508	Breckland 006	1	G	100%	1
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E02006130	Cannock Chase 013	1	G	100%	1
E02006219	Tamworth 003	1	G	100%	1
E02006227	Babergh 001	2	G	100%	2
E02006229	Babergh 003	2	G	100%	2
E02006230	Babergh 004	31	G	100%	31
E02006231	Babergh 005	60	G	100%	60
E02006232	Babergh 006	1	G	100%	1
E02006233	Babergh 007	4	G	100%	4
E02006234	Babergh 008	2	G	100%	2
E02006236	Babergh 010	21	G	100%	21
E02006237	Babergh 011	12	G	100%	12
E02006238	Forest Heath 001	2	G	100%	2
E02006239	Forest Heath 002	2	G	100%	2
E02006241	Forest Heath 004	1	G	100%	1
E02006242	Forest Heath 005	1	G	100%	1
E02006243	Forest Heath 006	2	G	100%	2
E02006251	Ipswich 007	356	G	100%	356
E02006254	Ipswich 010	271	G	100%	271
E02006255	Ipswich 011	55	G	100%	55
E02006256	Ipswich 012	46	G	100%	46
E02006257	Ipswich 013	7	G	100%	7
E02006258	Ipswich 014	275	G	100%	275
E02006259	Ipswich 015	8	G	100%	8
E02006260	Ipswich 016	26	G	100%	26
E02006261	Mid Suffolk 001	9	G	100%	9
E02006262	Mid Suffolk 002	1	G	100%	1
E02006263	Mid Suffolk 003	6	G	100%	6
E02006264	Mid Suffolk 004	2	G	100%	2
E02006265	Mid Suffolk 005	3	G	100%	3
E02006266	Mid Suffolk 006	3	G	100%	3
E02006268	Mid Suffolk 008	6	G	100%	6
E02006269	Mid Suffolk 009	4	G	100%	4
E02006270	Mid Suffolk 010	27	G	100%	27
E02006273	St Edmundsbury 001	4	G	100%	4
E02006276	St Edmundsbury 004	2	G	100%	2
E02006277	St Edmundsbury 005	6	G	100%	6
E02006278	St Edmundsbury 006	7	G	100%	7
E02006279	St Edmundsbury 007	5	G	100%	5
E02006280	St Edmundsbury 008	2	G	100%	2
E02006281	St Edmundsbury 009	6	G	100%	6
E02006283	St Edmundsbury 011	2	G	100%	2
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E02006342	Epsom and Ewell 008	1	G	100%	1
E02006360	Guildford 017	1	G	100%	1
E02006364	Mole Valley 003	1	G	100%	1

E02006406	Spelthorne 004	1	G	100%	1
E02006578	Crawley 004	1	G	100%	1
E02006593	Horsham 006	1	G	100%	1
E02006642	Wiltshire 038	1	G	100%	1
E02006796	Hillingdon 033	1	G	100%	1
E02006826	Forest Heath 008	4	G	100%	4
E02006833	Tonbridge and Malling 014	1	G	100%	1
E02006853	Tower Hamlets 032	1	G	100%	1
E02006873	South Cambridgeshire 020	1	G	100%	1
E02006877	Peterborough 022	1	G	100%	1
E02006887	Bristol 054	1	G	100%	1
E02006907	Norwich 014	1	G	100%	1
E02006922	Colchester 022	6	G	100%	6
E02006298	Suffolk Coastal 012	112	H	100%	112
E02006299	Suffolk Coastal 013	21	H	100%	21
E02006300	Suffolk Coastal 014	40	H	100%	40
E02006301	Suffolk Coastal 015	172	H	100%	172

Appendix B – Illustrative Framework Masterplan



Contractors are not to scale dimensions from this drawing

- Key
- Site Boundary
 - Northern Quadrant
- Primary local centre
 - Secondary local centre
 - All-through school
 - Main Green Infrastructure Area (mix of informal and formal recreation)
 - Area contributing to open space strategy (green corridor for footpaths/bridleways and trim trails)
 - Area contributing to open space strategy (formal recreation)
 - Allotments / community orchard
 - Allotments
 - Heritage feature
 - Heritage park (mix of informal and formal recreation)
 - Vehicular access point
 - Proposed & existing footpath / bridleway
 - Primary road

Revision	Date	Description
--	YY-MM-DD	--

BroadwayMalyan^{BM}
Architecture Urbanism Design
3 Weybridge Business Park
Addlestone Road
Weybridge, Surrey
KT15 2BW
T: +44 (0)1932 845 599
F: +44 (0)1932 855 206
E: Wey@BroadwayMalyan.com
www.BroadwayMalyan.com

Client
CLL / CEG
Project
Land south and east of Adastral Park
Description
Illustrative Framework Masterplan

Status
Draft
Scale
1:5,000@A1 BM
Job Number
31677
Drawn By
08
Date
22.03.17
Revision
G

Appendix C – Accident Statistics



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Suffolk County Council
Licence No. 100023395

AMustafa_Martlesham_010811-010816_Location Plan
Selected Range of Accidents between dates 01/08/2011 and 01/08/2016
Selected using Manual Selection

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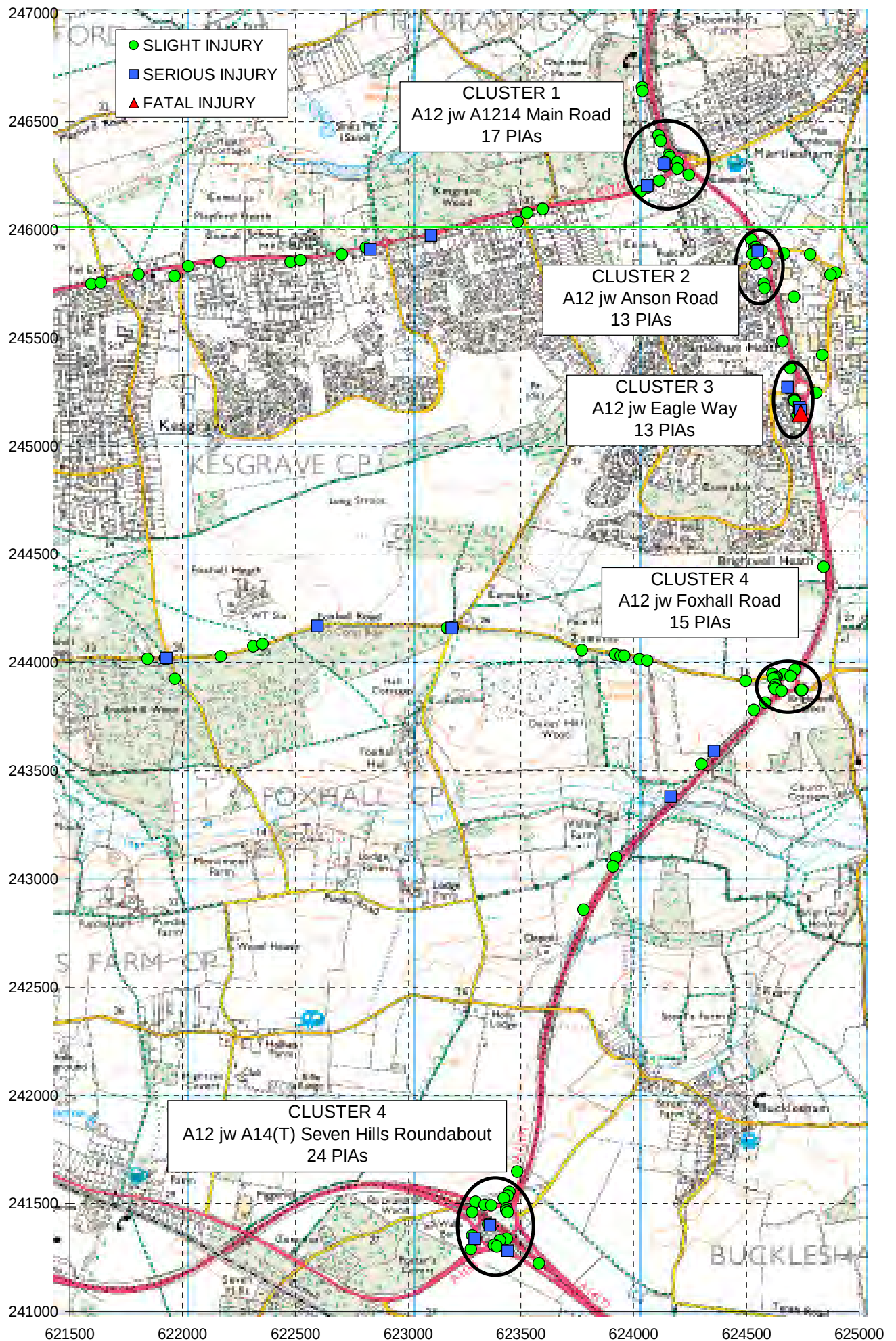
SCALE	1 : 27840
DATE	29/11/2016
DRAWING No.	
DRAWN BY	

ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

[illegible]

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Reference No.	SCEA690201	0514512	0323211	SCEA954251	SCEA787081	SCEA8060014	0401611	SCEA9642215	0039712	1665073	SCEA862001	SCEA764101	SCEA940931	SCEA936091	1693667	SCEA718081	SCEA807441	SCEA924871	SCEA807531	SCEA9425915
date	16-Jan-2013	30-Nov-2012	15-Aug-2011	18-Nov-2015	9-Mar-2014	25-May-2014	29-Sep-2011	18-Dec-2015	21-Jan-2012	25-Apr-2016	6-Dec-2014	28-Nov-2013	30-Sep-2015	13-Sep-2015	14-Jul-2016	2-Jun-2013	27-May-2014	27-Jul-2015	30-May-2014	16-Aug-2015
day	WED	FRI	MON	WED	SUN	SUN	THU	FRI	SAT	MON	SAT	THU	WED	SUN	THU	SUN	TUE	MON	FRI	SUN
time	1522	1715	0720	1330	1225	1100	2028	2214	2110	1725	2208	0850	1022	1630	1425	2008	0845	0650	2325	1115
severity	SL	SERIOUS	SL	SL	SL	SL	SL	SERIOUS	SL	SL	SERIOUS	SL	SL	SL	SL	SL	SL	SL	SL	SL
no. vehicles	2	3	2	2	1	2	1	3	2	2	3	2	2	1	2	1	2	1	1	2
no. casualties	1	3	2	1	2	1	3	3	1	2	4	1	1	1	1	2	1	1	1	1
young driver <=23	20	18	20	22		18		17	17	22		17	22		20		18			
old driver >=80																				
light/dark	L	DARK	L	L	L	L	DARK	DARK	DARK	L	DARK	L	L	L	L	L	L	L	DARK	L
road dry/wet	WET	D	D	D	D	D	D	WET	D	D	WET	D	WET	D	WET	D	D	Flood	WET	D
weather	F	F	F	F	F	F	Fog or mist	F	F	F	F	FOG&MST	F	F	F	F	RAIN	RAIN	F	RAIN
pedestrian																				
pedal cycle																				
motor cycle						YES			YES							YES				
parked veh																				
LGV/HGV/PSV																				
skidding																YES				
other loss control					YES	YES		YES						YES	YES		YES	YES	YES	YES
excessive speed																				
on bend								YES	YES										YES	YES
alcohol																				
illness																				
object in road																YES	YES	YES	YES	
vehicle defect					YES															
inexperience									YES											
disobeyed control		YES																		
rear shunt						YES											YES			
failed to give way	YES	YES	YES						YES	YES	YES	YES	YES			YES				
changing lane																				
U-turn																				
overtaking																				
head-on				YES				YES												YES
reversing					YES		YES											YES	YES	
single veh																	YES			
pedestrian																				
other																				
DESCRIPTION	V1 TURNED RIGHT INTO THE PATH OF V2 TRAVELLING TOWARDS IPSWICH V1 PASSENGER SUFFERED SLIGHT INJURIES	ROAD SINGLE CHWY IN RURAL LOCATION. ROAD DARK. UNIT HOWEVER WAS DIRTY, IN GOOD REPAIR AND CLEARLY MARKED. COLLISION INVOLVED 3 VEHICLES. V1 ON BELL LANE WITH INTENTION OF TURNING RIGHT INTO FOXHALL ROAD. V2 TRVG ON FOXHALL ROAD TWOS A12. V3 ON FOXHALL ROAD	V1 HAS ENTERED MAIN ROAD IN PATH OF ONCOMING VEHICLE BELIEVING V2 IS TURNING INTO V2'S JUNC	V2 ON MONUMENT FARM LANE HEADED SOUTH SLOWED AND STOPPED AT NEAR SIDE TO LET V1 PASS. V1 APPROACHED FAILED TO SLOW AND HIT OFFSIDE OF V2	WHILST TRVG IN NATIONAL SPEED LIMIT V1 WAS CLIPPED CURB AND THEN ROLLED CAR.	V1 TRY7 BERING V2 WHEN V2 BRAKED WHILE APPROACHING A RIGHT TURN. V1 COULD NOT BRAKE IN TIME AND TO AVOID COLLIDING WITH THE BACK OF V2 IT WENT ONTO THE WENT OF V2 LOST CONTROL AND RIDER DISMOUNTED CAUSING SLIGHT INJURY	SINGLE VEHICLE MINOR INJURY RTC. V2 TRAVELLING ALONG FOXHALL ROAD HEADING TOWARDS A12. SWIPES V2 IN. CROSS ROAD. V1 INTENDED TO CROSS FOXHALL ROAD INTO HALL ROAD, ON STARTING THIS MANOEUVRE HE IS AWARE OF V2 APPROACHING AND V1 ACCELERATES TOWARDS HALL ROAD TO AVOID A	V2 WAS TRVG ALONG FOXHALL ROAD TWOS IPSWICH LOST CONTROL ON A RIGHT HAND BEND SIDE SWIPES V2 IN. CROSS FOXHALL ROAD INTO HALL ROAD, ON STARTING THIS MANOEUVRE HE IS AWARE OF V2 APPROACHING AND V1 ACCELERATES TOWARDS HALL ROAD TO AVOID A	2 VEH RTC WITH MINOR INJURY. VEH 1 HAS BEEN HELD AT JUNCTION APPROACHING VEH 2 HAS BEEN TRAVELLING ALONG MAIN ROAD TOWARDS A12. THE VEH IN FRONT OF VEH 2 HAS TURNED LEFT INTO JUNCTION WHERE VEH 1 IS WAITING. VEH 1 HAS THEN PULLED OUT D	V1 TRVG FOXHALL ROAD INTO TOWN AND V2 TRVG IN OPPOSITE DIRECTION. V1 HAS TURNED ACROSS THE PATH OF V2 TRAVELLING INTO FOXHALL ROAD HEADED EAST COLLISION OCCURRED	V1 ON DOBBS LANE AT JW FOXHALL ROAD PULLED OUT INTO PATH OF V2 ON FOXHALL ROAD HEADED NEAR SIDE INTO BUSHES	V1 ON FOXHALL ROAD HEADED WEST WHEN AQUAPLANED ON WATER LOST CONTROL LEFT NEAR SIDE INTO BUSHES	VEH 1 WAITING TO TURN RIGHT AS EXITING FOXHALL HWRC. VEH 2 APPROACHING VEH 1 FROM THE RIGHT. VEH 2 INDICATING LEFT. UNINTENTIONALLY VEH 1 TOOK SIGNAL TO MEAN TURNING OFF OF VEH 2.	RIDER OF MCYCLE HAD A PILLION PASSENGER. V1 TRVG IN DIRECTION OF IPSWICH HAVING JUST EXITED A12 ON FOXHALL ROAD. V3 FAILED TO STOP IN TIME AND HAS COLLIDED WITH THE REAR OF V2	VEHS TRVG ALONG FOXHALL ROAD NEAR RECYCLING CENTRE HAVE BRAKED HARD DUE TO FLOODED ROAD V3 FAILED TO STOP IN TIME AND HAS COLLIDED WITH THE REAR OF V2	V2 ON FOXHALL ROAD HEADED WEST WHEN LOST CONTROL ON LEFT HAND BEND LEFT ROAD TO NEAR SIDE AND OVERTURNED	V2 TRVG ALONG FOXHALL ROAD HEADED TOWARDS A12 HAS GONE ROUND A L H BEND LEFT ROAD TO NEAR SIDE AND OVERTURNED	V1 ON FOXHALL ROAD HEADED TOWARDS A12 WHEN LOST CONTROL AND HIT V2 IN OPPOSITE DIRECTION	V1 ON FOXHALL ROAD HEADED TOWARDS A12 WHEN LOST CONTROL AND HIT V2 IN OPPOSITE DIRECTION	
other contributory factors	Failed to signal properly / Failed to judge / Failed to look properly	Discarded 'Give Way' or 'Stop' marking / Junction unclear / Poor lane or maintenance / Failed to signal or misreading signal	Poor turn or misreading / Junction unclear / Poor lane or maintenance / Failed to judge / Failed to signal or misreading signal	Failed to signal properly / Confusion, checked or is busy	Lacks of control / Types of control / Lane or under utilised	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Blind, blind, snow or fog / Lane or misperceived / Misreading signal	Lacks of control / Lane or under utilised	Poor turn or misreading / Junction unclear / Poor lane or maintenance / Failed to judge / Failed to signal or misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal	Failed to signal properly / Failed to judge / Lane or misperceived / Misreading signal
LOCATION	AT THE JUNCTION OF BELL LANE AND FOXHALL ROAD	FOXHALL ROAD AT JUNC BELL LANE, IPSWICH	FOXHALL ROAD AND BELL LANE FOXHALL	FOXHALL, MONUMENT FARM LANE APPROX 100MTRS SOUTH OF FOXHALL ROAD	FOXHALL ROAD NEAR BELL LANE KESGRAVE	FOXHALL ROAD IPSWICH	C322 FOXHALL ROAD	KESGRAVE, FOXHALL ROAD APPROX 600MTRS WEST OF DOBBS LANE	FOXHALL ROAD AND DOBBS LANE, WOODBRIDGE	FOXHALL ROAD C322 DOBBS LANE	FOXHALL ROAD C322 DOBBS LANE FOXHALL	AT THE JUNCTION OF FOXHALL ROAD AND FOXHALL ROAD	FOXHALL, FOXHALL ROAD JW DOBBS LANE	FOXHALL, FOXHALL ROAD APPROX 150MTRS WEST OF RECYCLING CENTRE	FOXHALL ROAD UNSPECIFIED ROAD LOCATION HWRC	FOXHALL ROAD NEAR RECYCLING CENTRE, FOXHALL, IPSWICH	FOXHALL ROAD IPSWICH	FOXHALL, FOXHALL ROAD OUTSIDE CIVIC AMENITY SITE	FOXHALL ROAD IPSWICH	FOXHALL, FOXHALL ROAD APPROX 130MTRS WEST OF THE A12
OS grid ref E	621924	621928	621932	621967	622170	622315	622354	622598	623174	623192	623195	623198	623199	623771	623918	623944	623959	624026	624061	624496
OS grid ref N	244017	244020	244017	243924	244028	244074	244085	244168	244159	244161	244159	244159	244159	244056	244036	244030	244030	244014	244009	243913

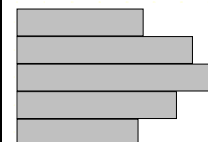
Locations of PIAs at A12, A1214 Woodbridge Road, Foxhall Road & Adastral Park (from Sep-2011 to Aug-2016)



ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No.	10341	SITE	A12, A1214 Woodbridge Road, Foxhall Road & Adastral Park	ANALYSED BY	S.M.T.
JOB NAME	ADASTRAL PARK	PERIOD	from 1-Sep-11 to 31-Aug-16	DATE	Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	20	3	0	23
YEAR 2	Aug-12	Aug-13	29	3	0	32
YEAR 3	Aug-13	Aug-14	34	4	0	38
YEAR 4	Aug-14	Aug-15	24	5	0	29
YEAR 5	Sep-15	Aug-16	20	1	1	22
TOTAL	Sep-11	Aug-16	127	16	1	144
			88%	11%	1%	



average =
28.8
PIAs per annum

CASUALTIES
TOTAL
35
47
45
43
28
198
average casualties/PIA= 1.4

SEASON	NUMBER	%
DEC / JAN / FEB	34	24%
MAR / APR / MAY	36	25%
JUN / JUL / AUG	40	28%
SEP / OCT / NOV	34	24%
TOTAL	144	100%

DAY	NUMBER	%
MON	23	16%
TUE	20	14%
WED	17	12%
THU	22	15%
FRI	22	15%
SAT	19	13%
SUN	21	15%
TOTAL	144	100%

TIME	NUMBER	%
0700-0900	16	11%
0900-1200	25	17%
1200-1400	20	14%
1400-1600	22	15%
1600-1900	46	32%
1900-2300	12	8%
2300-0700	3	2%
TOTAL	144	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	2	1%
PEDESTRIAN	2	1%
PEDAL CYCLE	10	7%
MOTOR CYCLE	23	16%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	74	51%
failed to give way	27	19%
changing lane	10	7%
overtaking	1	1%
head-on	3	2%
single veh	6	4%
pedestrian	2	1%
other	1	1%

CONTRIB FACTORS	NUMBER	%
SPEED	4	3%
SKID	4	3%
OTHER LOSS CONTROL	30	21%
BEND	8	6%
VEHICLE DEFECT	3	2%
OBJECT IN ROAD	8	6%
INEXPERIENCE	7	5%
Young Driver <=23	39	27%
Old Driver >=80	9	6%

CONDITIONS	NUMBER	%
DARK	32	22%
WET / ICE	49	34%
NOT FINE	27	19%

NOTABLE FACTORS:

Overall the number of accidents rose during the first three years, then returned to starting level by 5th year

17 or 12% of accidents resulted in serious or fatal injury

73 or 51% of accidents involved a rear end shunt

39 or 27% of accidents involved at least 1 driver aged 23 or under

31 or 21% of accidents involved at least one 2-wheeled vehicle:
23 motorcycles
10 pedal cycles
(2 involved one of each)

There are four distinct clusters of accidents, all at roundabout junctions on the A12

ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No.	10341	SITE	Cluster 1: A12 jw A1214 Main Road Roundabout			ANALYSED BY	S.M.T.	
JOB NAME	ADASTRAL PARK	PERIOD	from	1-Sep-11	to	31-Aug-16	DATE	Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	3	1	0	4
YEAR 2	Aug-12	Aug-13	2	0	0	2
YEAR 3	Aug-13	Aug-14	6	0	0	6
YEAR 4	Aug-14	Aug-15	2	1	0	3
YEAR 5	Sep-15	Aug-16	2	0	0	2
TOTAL	Sep-11	Aug-16	15	2	0	17
			88%	12%	0%	

CASUALTIES
TOTAL
8
2
6
4
2
22
1.3

average =
PIAs per annum
3.4

average casualties/PIA=

SEASON	NUMBER	%
DEC / JAN / FEB	3	18%
MAR / APR / MAY	6	35%
JUN / JUL / AUG	4	24%
SEP / OCT / NOV	4	24%
TOTAL	17	100%

DAY	NUMBER	%
MON	3	18%
TUE	2	12%
WED	1	6%
THU	2	12%
FRI	3	18%
SAT	3	18%
SUN	3	18%
TOTAL	17	100%

TIME	NUMBER	%
0700-0900	2	12%
0900-1200	4	24%
1200-1400	1	6%
1400-1600	4	24%
1600-1900	5	29%
1900-2300	1	6%
2300-0700	0	0%
TOTAL	17	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	0	0%
PEDESTRIAN	0	0%
PEDAL CYCLE	2	12%
MOTOR CYCLE	6	35%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	9	53%
failed to give way	3	18%
changing lane	1	6%
overtaking	0	0%
head-on	1	6%
single veh	0	0%
pedestrian	0	0%
other	0	0%

CONTRIB FACTORS	NUMBER	%
SPEED	1	6%
SKID	1	6%
OTHER LOSS CONTROL	3	18%
BEND	0	0%
VEHICLE DEFECT	0	0%
OBJECT IN ROAD	0	0%
INEXPERIENCE	1	6%
Young Driver <=23	4	24%
Old Driver >=80	1	6%

CONDITIONS	NUMBER	%
DARK	2	12%
WET / ICE	5	29%
NOT FINE	4	24%

NOTABLE FACTORS:

7 accidents involved 2-wheeled vehicles:
6 motorcyclists and 2 pedeal cycles

9 accidents involved rear end shunts

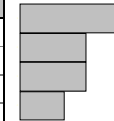
ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No. 10341
JOB NAME ADASTRAL PARK

SITE USTER 2: A12 jw Anson Road "TESCO" Roundabout
PERIOD from 1-Sep-11 to 31-Aug-16

ANALYSED BY S.M.T.
DATE Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	4	1	0	5
YEAR 2	Aug-12	Aug-13	3	0	0	3
YEAR 3	Aug-13	Aug-14	3	0	0	3
YEAR 4	Aug-14	Aug-15	2	0	0	2
YEAR 5	Sep-15	Aug-16	0	0	0	0
TOTAL	Sep-11	Aug-16	12	1	0	13
			92%	8%	0%	



average =
2.6
PIAs per annum

average casualties/PIA=

CASUALTIES
TOTAL
6
3
4
2
15
1.2

SEASON	NUMBER	%
DEC / JAN / FEB	5	38%
MAR / APR / MAY	0	0%
JUN / JUL / AUG	5	38%
SEP / OCT / NOV	3	23%
TOTAL	13	100%

DAY	NUMBER	%
MON	3	23%
TUE	3	23%
WED	0	0%
THU	1	8%
FRI	4	31%
SAT	1	8%
SUN	1	8%
TOTAL	13	100%

TIME	NUMBER	%
0700-0900	0	0%
0900-1200	1	8%
1200-1400	2	15%
1400-1600	1	8%
1600-1900	8	62%
1900-2300	1	8%
2300-0700	0	0%
TOTAL	13	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	0	0%
PEDESTRIAN	0	0%
PEDAL CYCLE	0	0%
MOTOR CYCLE	2	15%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	6	46%
failed to give way	1	8%
changing lane	5	38%
overtaking	0	0%
head-on	0	0%
single veh	0	0%
pedestrian	0	0%
other	0	0%

CONTRIB FACTORS	NUMBER	%
SPEED	0	0%
SKID	0	0%
OTHER LOSS CONTROL	3	23%
BEND	0	0%
VEHICLE DEFECT	0	0%
OBJECT IN ROAD	0	0%
INEXPERIENCE	1	8%
Young Driver <=23	3	23%
Old Driver >=80	0	0%

CONDITIONS	NUMBER	%
DARK	6	46%
WET / ICE	6	46%
NOT FINE	4	31%

NOTABLE FACTORS:

The accidents do appear to be on a reducing trend.

6 of the accidents involved rear and shunts and a further 5 were caused as a result of vehicles changing lane.

Almost half of the accidents occurred during the hours of darkness

Almost half of the accidents occurred on a wet road surface.

8 of the accidents occurred during the evening peak hour

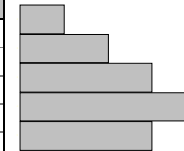
ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No. 10341
JOB NAME ADASTRAL PARK

SITE CLUSTER 3: A12 jw Eagle Way Roundabout
PERIOD from 1-Sep-11 to 31-Aug-16

ANALYSED BY S.M.T.
DATE Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	1	0	0	1
YEAR 2	Aug-12	Aug-13	2	0	0	2
YEAR 3	Aug-13	Aug-14	2	1	0	3
YEAR 4	Aug-14	Aug-15	2	2	0	4
YEAR 5	Sep-15	Aug-16	2	0	1	3
TOTAL	Sep-11	Aug-16	9	3	1	13
			69%	23%	8%	



average =
PIAs per annum
2.6

average casualties/PIA=

CASUALTIES
TOTAL
1
2
3
7
4
17
1.3

SEASON	NUMBER	%
DEC / JAN / FEB	4	31%
MAR / APR / MAY	3	23%
JUN / JUL / AUG	1	8%
SEP / OCT / NOV	5	38%
TOTAL	13	100%

DAY	NUMBER	%
MON	0	0%
TUE	2	15%
WED	1	8%
THU	6	46%
FRI	1	8%
SAT	2	15%
SUN	1	8%
TOTAL	13	100%

TIME	NUMBER	%
0700-0900	2	15%
0900-1200	1	8%
1200-1400	1	8%
1400-1600	2	15%
1600-1900	5	38%
1900-2300	2	15%
2300-0700	0	0%
TOTAL	13	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	0	0%
PEDESTRIAN	0	0%
PEDAL CYCLE	0	0%
MOTOR CYCLE	3	23%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	9	69%
failed to give way	0	0%
changing lane	2	15%
overtaking	0	0%
head-on	0	0%
single veh	0	0%
pedestrian	0	0%
other	0	0%

CONTRIB FACTORS	NUMBER	%
SPEED	1	8%
SKID	0	0%
OTHER LOSS CONTROL	3	23%
BEND	0	0%
VEHICLE DEFECT	0	0%
OBJECT IN ROAD	1	8%
INEXPERIENCE	0	0%
Young Driver <=23	5	38%
Old Driver >=80	2	15%

CONDITIONS	NUMBER	%
DARK	5	38%
WET / ICE	5	38%
NOT FINE	2	15%

NOTABLE FACTORS:

The accidents appear to be on a generally rising trend.

9 of the accidents involved rear end shunts

7 of the accidents involved young or elderly drivers

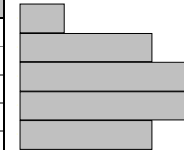
ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No. 10341
JOB NAME ADASTRAL PARK

SITE CLUSTER 4: A12 jw Foxhall Road Roundabout
PERIOD from 1-Sep-11 to 31-Aug-16

ANALYSED BY S.M.T.
DATE Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	1	0	0	1
YEAR 2	Aug-12	Aug-13	3	0	0	3
YEAR 3	Aug-13	Aug-14	4	0	0	4
YEAR 4	Aug-14	Aug-15	4	0	0	4
YEAR 5	Sep-15	Aug-16	3	0	0	3
TOTAL	Sep-11	Aug-16	15	0	0	15
			100%	0%	0%	



average =
PIAs per annum
3.0

average casualties/PIA=

CASUALTIES
TOTAL
1
5
6
4
5
21
1.4

SEASON	NUMBER	%
DEC / JAN / FEB	2	13%
MAR / APR / MAY	8	53%
JUN / JUL / AUG	4	27%
SEP / OCT / NOV	1	7%
TOTAL	15	100%

DAY	NUMBER	%
MON	1	7%
TUE	3	20%
WED	2	13%
THU	2	13%
FRI	1	7%
SAT	2	13%
SUN	4	27%
TOTAL	15	100%

TIME	NUMBER	%
0700-0900	2	13%
0900-1200	2	13%
1200-1400	3	20%
1400-1600	4	27%
1600-1900	3	20%
1900-2300	1	7%
2300-0700	0	0%
TOTAL	15	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	0	0%
PEDESTRIAN	0	0%
PEDAL CYCLE	0	0%
MOTOR CYCLE	3	20%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	11	73%
failed to give way	0	0%
changing lane	1	7%
overtaking	0	0%
head-on	0	0%
single veh	2	13%
pedestrian	0	0%
other	0	0%

CONTRIB FACTORS	NUMBER	%
SPEED	0	0%
SKID	0	0%
OTHER LOSS CONTROL	2	13%
BEND	1	7%
VEHICLE DEFECT	0	0%
OBJECT IN ROAD	1	7%
INEXPERIENCE	2	13%
Young Driver <=23	3	20%
Old Driver >=80	2	13%

CONDITIONS	NUMBER	%
DARK	2	13%
WET / ICE	3	20%
NOT FINE	2	13%

NOTABLE FACTORS:

10 accidents involves rear end shunts

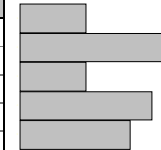
ANALYSIS OF PERSONAL INJURY ACCIDENT RECORD

JOB No. 10341
JOB NAME ADASTRAL PARK

SITE CLUSTER 5: A12 jw A14(T) & A1156, Seven Hills Roundabout
PERIOD from 1-Sep-11 to 31-Aug-16

ANALYSED BY S.M.T.
DATE Dec-16

NUMBER	from	to	ACCIDENTS			
			SLIGHT	SERIOUS	FATAL	TOTAL
YEAR 1	Sep-11	Aug-12	2	1	0	3
YEAR 2	Aug-12	Aug-13	5	2	0	7
YEAR 3	Aug-13	Aug-14	3	0	0	3
YEAR 4	Aug-14	Aug-15	6	0	0	6
YEAR 5	Sep-15	Aug-16	5	0	0	5
TOTAL	Sep-11	Aug-16	21	3	0	24
			88%	13%	0%	



average =
PIAs per annum
4.8

average casualties/PIA=

CASUALTIES
TOTAL
5
13
4
9
5
36
1.5

SEASON	NUMBER	%
DEC / JAN / FEB	5	21%
MAR / APR / MAY	6	25%
JUN / JUL / AUG	8	33%
SEP / OCT / NOV	5	21%
TOTAL	24	100%

DAY	NUMBER	%
MON	4	17%
TUE	2	8%
WED	5	21%
THU	3	13%
FRI	6	25%
SAT	1	4%
SUN	3	13%
TOTAL	24	100%

TIME	NUMBER	%
0700-0900	3	13%
0900-1200	4	17%
1200-1400	4	17%
1400-1600	4	17%
1600-1900	9	38%
1900-2300	0	0%
2300-0700	0	0%
TOTAL	24	100%

INVOLVED	NUMBER	%
PARKED VEHICLE	0	0%
PEDESTRIAN	0	0%
PEDAL CYCLE	1	4%
MOTOR CYCLE	1	4%
PSV	0	0%
HGV	0	0%

TYPE	NUMBER	%
rear shunt	19	79%
failed to give way	2	8%
changing lane	1	4%
overtaking	0	0%
head-on	0	0%
single veh	0	0%
pedestrian	0	0%
other	0	0%

CONTRIB FACTORS	NUMBER	%
SPEED	2	8%
SKID	1	4%
OTHER LOSS CONTROL	3	13%
BEND	2	8%
VEHICLE DEFECT	0	0%
OBJECT IN ROAD	0	0%
INEXPERIENCE	1	4%
Young Driver <=23	1	4%
Old Driver >=80	1	4%

CONDITIONS	NUMBER	%
DARK	3	13%
WET / ICE	5	21%
NOT FINE	3	13%

NOTABLE FACTORS:

19 or 79% of accidents involved rear end shunts