TRANSPORT ASSESSMENT

HAVERHILL

GREAT WILSEY PARK

Great Wilsey Park,
Haverhill, Suffolk

Transport Assessment

Hallam Land Management & Mrs Pelly

Brookbanks

Document Control Sheet

Document Title: Transport Assessment

Document Ref: 10173/TA/01

Project Name: Land at Haverhill

Project Number: 10173

Client: Hallam Land Management Ltd and Mrs Pelly

Document Status

Rev	Issue Status	Prepared / Date	Checked / Date	Approved / Date
0	Draft	M Moss 16/04/15	L Witts 16/04/15	P Boileau 16/04/15
1	Draft	A Eggleston 24/06/15	L Witts 26/06/15	P Boileau 26/06/15
2	Final	A Eggleston 10/08/15	L Witts 10/08/15	P Boileau 10/08/15
3	Final	M Moss 24/09/15	A Eggleston 24/09/15	L Witts 24/09/15
4	Final	M Moss 13/10/15	A Eggleston 13/10/15	L Witts 13/10/15

Issue Record

Name / Date & Revision	16/04/15	26/06/15	10/08/15	24/09/15	13/10/15	
Peter Glazebrook (Hallam Land Management Ltd)	0	1	2	3	4	
David Lewis (CEG)	0	1	2	3	4	

Contents

Appendix

Executive Summary

Brookbanks Consulting (BCL) is appointed by Hallam Land Management (HLM) and Mrs Pelly (the landowner) to produce a Transport Assessment and Travel Plan to accompany a planning application for a residential-led mixed use development at Haverhill in Suffolk. The development will be referred to as Great Wilsey Park in the remainder of this report.

The proposed development will comprise up to 2,500 new houses (a percentage of which will be affordable), two primary schools (one 2-form entry and the other 1-form entry) and supporting uses including two local centres incorporating retail, employment and community facilities, and open space provision.

As part of evidence prepared in support of the development proposals, BCL has worked in conjunction with representatives of both the Local Planning Authority (LPA) and the Highway Authority, Suffolk County Council (SCC), to work towards agreement on all highways matters, including trip generation forecasts, traffic modelling methodology and results, together with the production of a package of mitigation measures to enhance the highway network and accessibility of the area while mitigating for transport impacts of the development proposals.

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 and local transport and land-use policies. These support the LPA 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. The proposals seek to address positively the principles set out in relation to Haverhill in the Haverhill Vision 2031 (part of the statutory local plan) and the St Edmundsbury Core Strategy.

To serve the development, two main access points are proposed, , from A143 Haverhill Road and Chalkstone Way. A further third minor access is provided on Coupals Road to serve the Country Park only, with no through route to the rest of the proposed development. This access strategy is consistent with the Local Plan evidence base documents that have been tested independently and again within this document. The access strategy has been assessed in detail within this report and confirms the acceptability of same.

Design of the transport and highway proposals is considerate to the specific concerns of the local Haverhill community. The access strategy has been considered to specifically limit the increase in traffic through Haverhill. The selection of a roundabout on the A143 Haverhill Road provides a direct link into the proposed development. In conjunction with the North West Relief Road (NWRR) permitted as part of the North West Haverhill development, this will limit the need to travel through Haverhill. The selection of a signalled junction as a secondary access into the proposed development will ensure that Great Wilsey Park integrates well with existing residential areas of Haverhill.

Through discussions with the Highway Authority, the assessment of the development has been carried out on an incremental basis. The initial Phase assumes 500 dwellings on both the North West Growth Area (NWGA) and Great Wilsey Park. The identified constraint in the local highway is the Cangle junction. The assessment carried out demonstrates that 1,000 units can be delivered to the north of Haverhill prior to the NWRR. During reserved matters applications, the phasing can be tested further to identify the quantity of the initial phasing.

Arrangements to enhance public transport provision are provided by the proposed development together with new and enhanced footways and cycleways in the area, promoting an alternative to travel by private car. Pedestrian and cycle connections to neighbouring residential areas and existing public transport network will be enhanced. A much improved bus service operating at a 20 minute frequency will connect the proposed development to the town centre and bus interchange.

A key component of the transport mitigation measures is the implementation of a comprehensive Travel Plan (TP), which is of a scale sufficient to warrant a standalone document accompanying this Transport Assessment. The Travel Plan proposes a target for the site which will reduce the mode share by single occupancy private vehicles by 10%.

The potential impacts on the highway network have been tested, this has resulted in the identification of several offsite interventions that will be delivered by the proposed development.

The Cangle junction has been identified as a location of traffic constraint. This junction has been assessed in detail through Micro Simulation software which demonstrates that the impact on the junction can be managed to improve the traffic environment.

Following the review of the local road network, the following interventions have been identified:

Site Access Points

- **Great Wilsey Park northwestern access:** Formed via a three-arm roundabout with A143 Haverhill Road
- **Great Wilsey Park southern access:** Formed via a signalled controlled access point with Chalkstone Way
- **Great Wilsey Park southeastern access:** Formed via a priority junction with Coupals Road, that will only serve a car park for the recreational space within the development

Off Site interventions

- **A143 / Lord's Croft Lane:** Implementation of traffic signals in place of existing roundabout
- **A143 / Manor Road Junction**: Small localised widening to the A143 approach roads at the mini-roundabout with Manor Road
- **A1017 / A1307 Roundabout:** Improvements to the roundabout between the A1017 and A1307 with the addition of a dedicated left-turn lane from A1307 Cambridge Road (West) into A1307 Cambridge Road (East)
- **A1307 Withersfield Road / Queens Street Roundabout:** Localised widening to the western approach to the roundabout from A1307 Withersfield Road.

Overall, Great Wilsey Park provides a comprehensive package of measures to enhance public transport and local pedestrian and cycle links, which will provide a suitable alternative to the private car. To limit the short-term effects on Haverhill town centre, 1,000 dwellings can be delivered to the North of the town prior to completion of the NWRR. In addition, a number of off-site junction improvements are proposed to remove potential local capacity constraints. Once the NWRR is constructed, Great Wilsey Park can be completed without further impact on Haverhill town centre.

1 Introduction

1.1 Brookbanks Consulting Limited (BCL) is appointed by Hallam Land Management Ltd (HLM) and Mrs Pelly to complete a Transport Assessment (TA) and a Travel Plan (TP) for the proposed residential led mixed-use development to the northeast of Haverhill in Suffolk.

1.2 The proposed development will be referred to as Great Wilsey Park in the remainder of this report. The proposed site is an allocated site within local planning policy. HLM and Mrs Pelly consider the development of this site to represent an appropriate and available location for development.

1.3 The assessment will be carried out in accordance with the National Planning Policy Framework, which establishes the presiding planning policy background.

1.4 The objective of the TA is to ensure the proposed development is acceptable from a transportation and highways viewpoint.

2 Background Information

Location

2.1 Haverhill is located some 25km to the southeast of Cambridge and lies within the County of Suffolk. The Local Planning Authority (LPA) is St Edmundsbury Borough Council (SEBC) with Suffolk County Council (SCC) being the Local Highway Authority.

2.2 The adopted Core Strategy (2010) identifies growth proposals within the Borough until 2031. Within Haverhill, two broad locations for growth are identified, being to the northwest and northeast of the town centre which are planned for 1,150 and 2,500 dwellings (the proposed development) respectively.

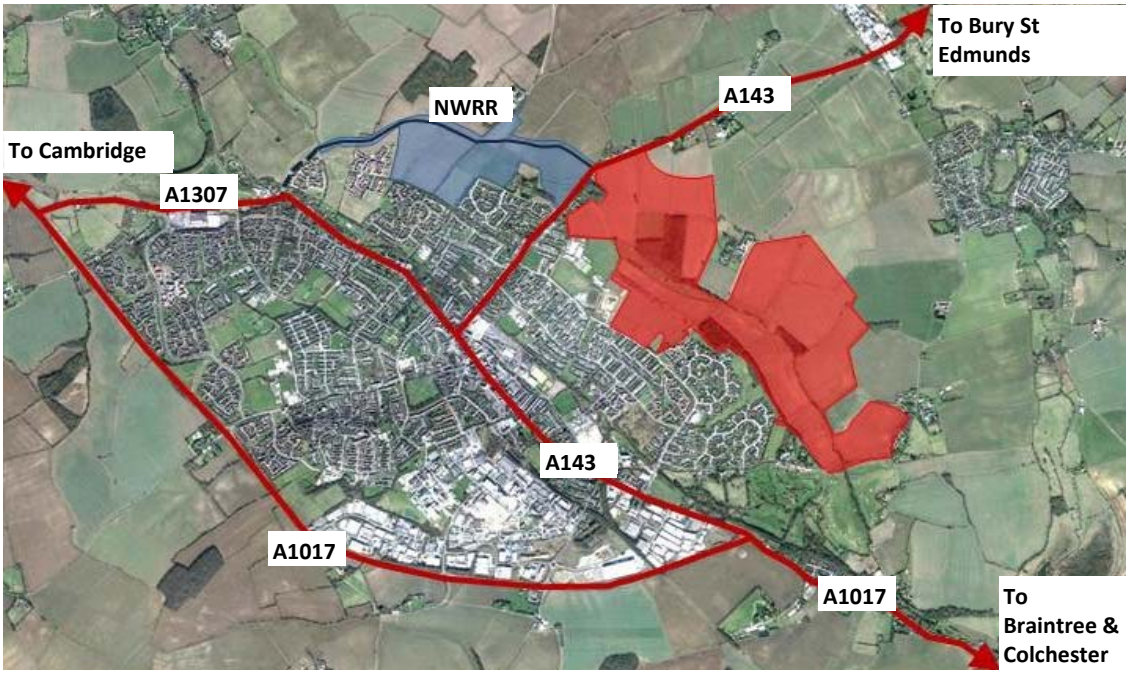


Figure 2a. Great Wilsey Park site location

2.3 The development to the northwest of Haverhill has planning permission, which includes the delivery of a North West Relief Road (NWRR, shown in Figure 2a). The legal agreement attached to the planning permission contains a mechanism to give the LPA control over the timing of delivery of the NWRR in relation to when the planning permission is implemented.

2.4 It is understood that agreement has been reached that the NWRR is to be delivered within 5 years from the commencement of the NWGA development.

Scheme Proposals

2.5 The Parameter Plan as attached in Appendix B, sets out built development components, areas of open space and the alignment of the primary strategic transport routes running through the site. The proposed development comprises:

- 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.
- Up to 2,500 dwellings (including extra care units) on 76.25ha.
- Two primary schools:
  - A two-form entry primary school in the western part of the site.
  - A single-form entry primary school in the eastern part of the site.
- Two mixed-use local centres (both are likely to include some residential accommodation, included in the 2,500 dwellings referred to above):
  - In the western part of the site the local centre will comprise up to 1,225sqm of Use Classes A1-5 and/or D1-2, and up to 5,600sqm of Use Classes B1 and/or D1-2 (of which between 450-2000sqm will be for D1 healthcare uses and up to 3,000sqm will be B1 uses).
  - In the eastern part of the site the local centre will comprise up to 1,225sqm of Use Classes A1-5 and/or D1-2.
- Land for the potential expansion of Samual Ward Academy, comprising 4.8ha.

2.6 The schools will be located on areas of the site that can accommodate school playing fields, which will complement the green infrastructure framework for the development. The location of the schools as proposed within the heart of the development will help to establish a key focal point for the development.

2.7 Design of the transport and highway proposals is considerate to the specific concerns of the local community. The access strategy has been considered to specifically limit the increase in traffic through Haverhill and integrate with the permitted NWRR. Three highway access points are proposed:

- The primary access will be a roundabout on the A143 Haverhill Road.
- A second access will be from a signalised junction on Chalkstone Way.
- A third access will be from a priority junction on Coupals Road, which will only serve as the access to the car park for the Country Park within the development. There will be no through route for vehicles to the rest of the development.

2.8 Detailed modelling set out later in this TA shows that no third access point is necessary to serve the built proposed development. A small additional access is provided on Coupals Road to serve the Country Park only with no through route to the rest of the proposed development.

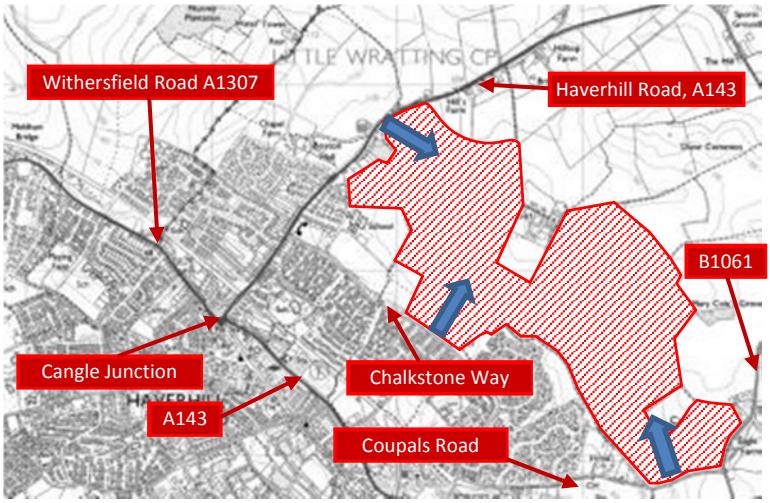


Figure 2c: Proposed Access Points for Great Wilsey Park

2.9 The potential impact of the proposals for Haverhill has been fully appraised. This assessment indicates that the delivery of these proposals will not materially increase the flows through the town.

2.10 Furthermore in relation to the highway assessment, the A143 Haverhill Road, Chalkstone Way and the new access have all been assessed. The results indicate that the junctions will operate satisfactorily when the development has been concluded.

2.11 The impact on Haverhill will be limited by discouraging the use of new highway links south of the access on the A143 Haverhill Road being used in preference using the new NWRR.

2.12 Consideration has also been given to the wider objectives in relation to transport in Haverhill as set out in the Vision 2031 Document. The objective of a 20 MPH speed limit through the centre of the proposed development, suggested in local planning policy, is supported in principle and is consistent with the highway layout proposed and in practice through the design of most streets within the development areas in accordance with such speeds.

Transport Assessment Consultations

2.13 In preparation for the planning application submission, detailed discussions have been held with SEBC and 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.

2.14 This process has resulted in working agreements across 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.
- Trip generation rates to be applied.
- Growth Rates
- Method of trip distribution
- Travel Plan principles.

Transport Assessment Structure

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

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

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

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

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

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

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

Chapter 9: Local Road Network Review – Junction Assessments
This chapter assesses the operation of the junctions within the network as a whole, taking into account the northwest Haverhill proposals, including the NWRR, and the proposed development.

Chapter 10: Local Road Network Review – Cangle Junction Assessment
This chapter assesses the impact on this junction as predicted by the micro-simulation traffic models.

Chapter 11: Limitations
This chapter defines the limitations on the above conclusions based on the accuracy of information received.

3 National And Local Policy Background

Policy Review

3.1 This chapter reviews the following documents:

- National Planning Policy Framework (NPPF) and National Planning Practice Guidance (NPPG)
- The St Edmundsbury Core Strategy (December 2010)
- The Haverhill Vision 2031 Area Action Plan (September 2014)
- The Forest Heath and St Edmundsbury Local Plan Joint Development Management Policies Document (February 2015)
- The Suffolk Local Transport Plan 2011-2031.

National Policy

3.2 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.

3.3 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.

3.4 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.

3.5 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.

3.6 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.

3.7 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; and
- An overall need to reduce the use of high-emission vehicles.

3.8 Paragraph 42-006 of the NPPG 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; and
- Reducing the need for new development to increase existing road capacity or provide new roads.

3.9 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; and
- Provision of improved public transport services.

3.10 **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.

3.11 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.

3.12 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.

3.13 Manual for Streets has updated geometric guidelines for low trafficked residential streets, examines the effect of the environment on road user behaviour, and draws on practice in other countries. This research provides the evidence base upon which the revised geometric guidelines in the Manual for Streets are based, including link widths, forward visibility, visibility splays and junction spacing.

3.14 Manual for Streets 2 - Wider Application of the Principles is the result of collaborative working between the Department for Transport and the transportation industry.

3.15 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.

3.16 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.

3.17 **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

3.18 The St Edmundsbury Core Strategy (December 2010) sets out the following;

- Visions for how the future growth of Bury St Edmunds, Haverhill and the Rural Areas will be managed;
- A collection of objectives and strategic policies to help guide the sustainable distribution of new development across the borough and achieve the visions;
- Policies to guide the scale, type and location of new development;
- Broad locations for growth in Bury St Edmunds and Haverhill; and

- Information on how the detail in the Core Strategy will be implemented and monitored.

3.19 The Core Strategy provides the strategic context that will guide the preparation of subsequent Local Plan documents. It includes an outline for delivering strategic development needs, including housing, employment, leisure and retail. The Core Strategy does not include details of site specific allocations or policies for the management of new development. These are set out in separate Local Plan documents.

3.20 The Core Strategy provides an overall spatial Vision for St. Edmundsbury Borough, as indicated below.

"By 2031 St Edmundsbury will remain a vibrant part of Suffolk and a region where the distinctive local character, unique local heritage and environmental and cultural assets are retained and enhanced for the enjoyment of all. The Borough will be a safe place to live with strong communities. Employment growth and development will produce a prosperous sustainable economy including sustainable tourism. All residents of the borough will have an equal opportunity to access services, jobs, housing and leisure facilities to maximise their potential to live and work in an environmentally sustainable manner. A hierarchy and network of town and village centres will grow and develop to provide a wide range of services in a good environment and accessible to all, appropriate to the size of settlement.

The borough will respond to the challenge of delivering growth in a manner that does not just respect the heritage and culture of St Edmundsbury but actually strives to enhance them in an environmentally sustainable way. The natural and built environment and local biodiversity of the borough will be protected and where possible enhanced to increase access to the countryside and the provision of green open space in recognition of the county ambition to become the greenest county. The challenges of climate change will be addressed to ensure that the specific threats that Suffolk faces are mitigated but that other adaptations are also made such as an increase in renewable energy and water efficiency and an active decrease in carbon emissions. All new development will respect the Breckland Special Protection Area, Special Areas of Conservation and Sites of Special Scientific Interest.

Bury St Edmunds and Haverhill will be the cultural and economic hearts of the borough with strong, sustainable links to the surrounding key services centres, villages and countryside.

…

Haverhill

- *Regeneration of the town will continue with the aim of being able to have a more attractive retail, leisure and employment offer to its residents to decrease the amount of out-commuting and to grow an organic 21st Century town based on strong community.*
- *The town centre will be a high quality environment where pedestrians and other non-car users can move around safely and comfortably.*
- *Development will be focused initially on the north-west Haverhill site and long-term development located on the north eastern edge of Haverhill.*
- *Existing surrounding settlements will be protected from coalescence and have green buffer zones developed between them and Haverhill to maintain their integrity.*
- *Haverhill will diversify its employment base, building on the bio-chemical industry and capitalising on the strong links it has with Cambridge and Stansted.*
- *To achieve the latter, long-term sustainable transport solutions will be developed to mitigate the difficulties of accessing strategic road networks along the A1307, A1017 and A143.*
- *Within the town, cycling and pedestrian links will be established.*

Outside Bury St Edmunds and Haverhill, new development will be focused primarily on those settlements where there are good levels of services and facilities, having regard to the environmental and infrastructure capacity of those settlements and the desire to safeguard existing services and employment."

3.21 To achieve the overall vision, there are 10 strategic objectives which have been identified. Those objectives relating to transport are intended to provide a higher level of access to jobs and services for all ages in both urban and rural areas, and improve connectivity with the rest of the region.

3.22 Policy CS7 'Sustainable Transport' states that the Council will develop and promote a high quality and sustainable transport system across the borough and reduce the need for travel through spatial planning and design. All proposals for development will be required to provide for travel by a range of means of transport other than the private car in accordance with the following hierarchy:

- Walking;
- Cycling;
- Public Transport (including taxis);
- Commercial vehicles;
- Cars.

3.23 All development proposals will be required to be accessible to people of all abilities including those with mobility impairments.

3.24 New commercial development, including leisure uses and visitor attractions, which generate significant demands for travel, should be located in areas well served by a variety of transport modes. Where appropriate, development proposals that will have significant transport implications will be required to have a transport assessment and travel plan showing how car based travel to and from the site can be minimised.

3.25 Policy CS8 'Strategic Transport Improvements' states that the Council will continue to work with relevant partners, including Suffolk County Council and the Highways Agency, and developers, to secure the necessary transport infrastructure, including improvements to:

- Transport safety on the A1307 between Haverhill and the A11;
- Relieve the adverse impacts of traffic in Haverhill ;
- The public transport network ;
- Rights of Way.

3.26 Policy CS12 'Haverhill Strategic Growth' states that an Area Action Plan DPD (this is the Haverhill Vision 2031 set out below) will be prepared for Haverhill that will provide a coordinated spatial planning framework for the whole town including the release of a larger, strategic, greenfield, site. The policy specifically refers to the proposed development site stating that it will:

- Maintain the identity and segregation of Kedington and Little Wratting;
- Provide new high quality strategic public open space and recreation facilities;
- Protect by appropriate means the Scheduled Ancient Monument at Great Wilsey Farm;
- Provide improved public transport, foot and cycle links to the town centre and other locally significant leisure, employment and service destinations;
- Deliver additional education, community and leisure facilities to meet the needs of this development and is located in a way that can achieve positive integration with the wider area;
- Deliver around 2,500 homes of mixed tenure and size, including affordable homes; and
- Provide opportunities for B1 use class local employment.

3.27 The policy goes on to state that it is unlikely that the development at the proposed development site will commence before 2021. The actual amount of development will be determined by environmental and infrastructure capacity considerations

and the preparation and adoption of detailed masterplans in which the local community and other stakeholders have been fully engaged.

3.28 The Haverhill Vision 2031 was adopted in September 2014. It includes a series of aspirations, including:

- Well-connected new development integrated into the town;
- Sustainable transport links; and
- An increased shift to non-car modes of travel.

3.29 Objective 7 states that the Vision will support and encourage all means of sustainable and safe transport, public transport improvements, and cycleway and footway improvements.

3.30 Policy HV12 'Haverhill North-West Relief Road' states that the NWRR will be provided between Wratting Road (A143) and Withersfield Road (A1307) as part of the North-West Haverhill strategic development (Policy HV3). The delivery and timing of the Relief Road will be controlled through a legal agreement attached to any planning permission for that development. Planning permission for the delivery of the North-West Haverhill strategic development in advance of the completion of the Relief Road will not be granted unless it is demonstrated that the transport impacts can be satisfactorily mitigated.

3.31 Policy HV4 'Strategic Site – North-East Haverhill' relates to the proposed development site and states that if planning application(s) to develop all or part of the site come forward in advance of the provision of the NWRR , permission will not be granted unless it is demonstrated that the transport impacts can be satisfactorily mitigated without the Relief Road.

3.32 The Adopted Great Wilsey Park Masterplan Supplementary Planning Document has been produced to support Policy HV4. It provides the framework against which the planning application will be determined by the Council.

3.33 The Adopted Joint Development Management Policies Document (February 2015) includes a range of policies relevant to transport.

3.34 Policy DM45 'Transport Assessments and Travel Plans' sets out the criteria requiring these document to accompany an planning application. It goes on to state that where a transport assessment and/or travel plan does not demonstrate that the travel impacts arising from the development will be satisfactorily mitigated or that adequate measures are in place to promote the use of more sustainable modes of transport, then planning permission will not be granted. The developer will be expected to provide the necessary funding to deliver any travel plan agreed in writing with the local planning authority. Where it is necessary to Great Wilsey Park development, developers will be required to make a financial contribution, appropriate to the scale of the development, towards the delivery of improvements to transport infrastructure or to facilitate access to more sustainable modes of transport.

3.35 Policy DM46 'Parking Standards' states that the authority will seek to reduce over-reliance on the car and to promote more sustainable forms of transport. All proposals for redevelopment, including changes of use, will be required to provide appropriately designed and sited car and cycle parking, plus make provision for emergency, delivery and service vehicles, in accordance with the adopted standards current at the time of the application. In particular it states that proposals for new mixed use sites will be expected to minimise the provision of car parking where achievable, for example by providing shared use parking, and/or car pooling as part of a Travel Plan.

3.36 The Suffolk Local Transport Plan 2011-2031 comprises two parts. Part 1 sets out the overarching transport strategy whilst Part 2 sets out local implementation plans, including a chapter specifically on Haverhill.

3.37 In Part 1, Chapter 3 'Transport Issues in Suffolk', the LTP states that :

"St Edmundsbury will continue to be a location for growth which could amount to at least 10,000 new homes in the next 20 years as well as a growth in jobs. The growth will be concentrated mainly in the towns of Bury St. Edmunds and Haverhill, with the remaining dwellings being across the rest of the borough. The proposed concentration of housing within Bury St Edmunds will present transport challenges if we are to avoid increased congestion within the town and on roads leading to it, including the A14. Growth throughout the rest of the borough and in neighbouring districts will also add to traffic in Bury St. Edmunds as more residents and visitors travel to the town from across the sub-region to access key services and retail. The level of growth within Haverhill will also impact upon the road network both within the town and the wider area if measures are not put in place to address increased levels of car use associated from extra car trips from them. Levels of safety and congestion on the A1307 between Haverhill and Cambridge in particular are likely to be of significant concern and we will work with St Edmundsbury and Cambridgeshire County Council to find solutions to these problems.

Economic growth within the district is also forecast to see the creation of about 13,000 new jobs, with strong demand in Bury St Edmunds and Haverhill. The location of additional employment opportunities will create additional pressure onto the road network within the district and larger towns if measures are not in place to ease the flow of traffic and to encourage the use of alternatives to single occupancy car commuting. Issues of accessibility to more remote employment locations will also need to be addressed, including links towards Cambridge and Stansted.

As with the other districts within Suffolk, the rural nature of St Edmundsbury outside of the larger towns raises areas of concern for accessibility for those people without access to cars. Bury St Edmunds and Haverhill act as service centres for the surrounding populations and it is important that development throughout the rest of the borough supports access by public transport to sites. Apart from Bury St Edmunds none of the settlements have direct access to rail services."

3.38 Key transport issues for Haverhill in itself include the following:

- Haverhill to Bury St Edmunds and Cambridge bus connections;
- Haverhill North West relief road;
- Haverhill cycle network;
- Haverhill road condition.

3.39 Part 2 states that the aim of the plan for Haverhill is to support the sustainable development of the town. Haverhill is likely to receive significant housing and employment growth. Given existing concerns about traffic levels, the challenges presented with substantial growth in Haverhill are reducing reliance on the car for the short journeys within the town and to larger urban centres such as Bury St Edmunds and Cambridge. Suffolk County Council will work with St Edmundsbury Borough Council, South Cambridgeshire District Council, and Cambridgeshire County Council in which they will work together to find solutions to traffic issues on the A1307.

3.40 Travel to work patterns for Haverhill highlight that over half of the population travel less than 2km to work i.e. within walking distance. There is also a significant proportion of residents travelling to Cambridge and Stansted Airport, which requires close working with our neighbouring authorities to implement solutions. Suffolk County Council will work with St Edmundsbury Borough Council to ensure that demand for car travel can be reduced by co-locating housing, key services and employment. They want to see better networks for walking and cycling so that these are more attractive and realistic choices. They expect that all new developments will implement robust travel plans to minimise car use, including improvement to sustainable travel infrastructure and services. They will also work with established employers at sites such as Haverhill Business Park; Haverhill Industrial Estate; and Boundary Road Industrial Estate to try to reduce car journeys.

3.41 Suffolk County Council will provide better information to people about travel including accessing information online, by mobile phones, or from variable message signs. There is a potential for urban traffic management and control in Haverhill to link traffic lights and provide priority for buses alongside real time bus information. Haverhill has a good network of walking and cycling routes but many are incomplete. Most areas of the town are within one kilometre of the centre and main employment locations.

3.42 Publicly funded infrastructure improvements will be limited at the start of this plan due to funding constraints, but we still hope to be able to fund important improvements to the walking and cycling networks. Developer funding of improvements to support the sustainability of new developments will also be essential. As the plan progresses larger-scale publicly funded schemes may be possible, but will still be judged on the benefits they offer and their deliverability.

3.43 A north west relief road is a much needed improvement. This is a requirement alongside housing development in this part of the town and will help relieve the Cangle junction of through traffic heading north towards Bury St. Edmunds.

Figure 3a: Key improvements to the Haverhill transport network

4 Existing Transport Conditions

Existing Travel Behaviour Overview

4.1 A review of 2011 Census data has been undertaken for residents within Haverhill East Ward. The modal split is indicated in Figure 4a with the distance travelled to work is indicated in Figure 4b. The site is largely located in the Haverhill East Ward and neighbouring the wards of Kedington and Withersfield. However the latter two wards are rural in nature and therefore will have travel characteristics inconsistent with the type of development proposed.

4.2 Haverhill East ward is deemed representative of the characteristics of the proposed development . It is located in a similar position to the highway network and would access similar sustainable facilities as the proposed development.

4.3 Based on the Census date, the most dominant mode of travel is by car, resulting in 64.6% of all trips within the Haverhill East ward. Travel by foot is the second most dominant mode of travel.

4.4 The Census data provides an indication of the distance travelled to work. This indicates that 6.4% of working people work from home. This percentage is largely representative the average for all of Haverhill.

Mode	Percentage
Train	0.5%
Bus, minibus or coach	4.5%
Driving a car or van	64.6%
Passenger in a car or van	7.4%
Motorcycle, scooter or moped	0.7%
Taxi	0.8%
Bicycle	2.1%
On foot	16.5%
Work mainly at or from home	2.5%
Other method of travel to work	0.4%

Figure 4a: Mode Share

Mode	Percentage
Working at or from home	6.4%
Less than 2km	36.5%
2km to less than 5km	7.6%
5km to less than 10km	3.0%
10km to less than 20 km	9.6%
20km to less than 40km	23.4%
40km to less than 60km	2.4%
60km and over	3.4%
Other	7.6%

Figure 4b: Distance travelled to work

Existing Highway Network

4.5 The location of the site in relation to the local road network is indicated in Figure 4c.

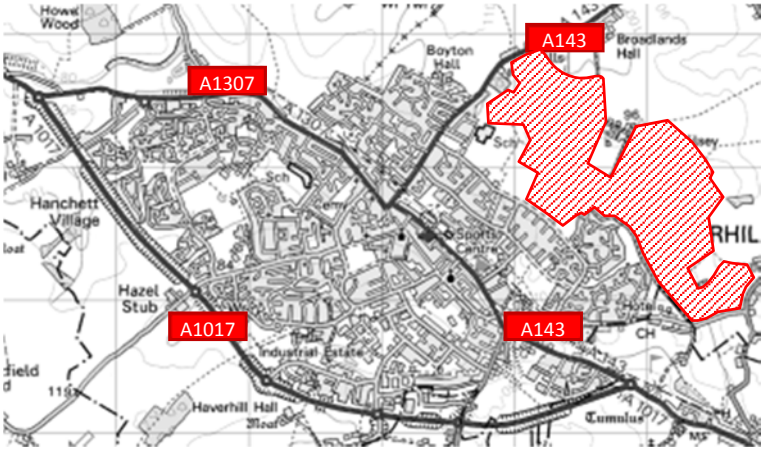


Figure 4c: Site Location in relation to the local road network

4.6 The road network adjacent to the site is classified as part of the Local Road Network (LRN).

4.7 The A143 is located to the west of the site and forms an important corridor within the LRN. The A143 commences from immediately to the south of Haverhill at a roundabout with the A1017 and heads generally in an north-easterly direction passing through Bury St. Edmunds approximately 25.5km from the proposed development site, where it crosses the A14 Felixstowe-Midlands strategic route, and terminating at the A12 London-Great Yarmouth road in Great Yarmouth. The A143 is predominantly single carriageway road which is subject to national speed limit along much of the length. The section approaching Haverhill is subject to a 30mph speed limit.

4.8 The A1307 starts at the Cangle Junction (with the A143) in Haverhill Town Centre, heading north-west from the roundabout, crossing the A11 London-Norwich strategic route, approximately 16km from the proposed development site, and terminating in Cambridge City Centre.

4.9 The A1017 starts at a roundabout with the A1307 to the north-west of Haverhill, heading in a south-easterly direction and serves as a 5.6km bypass for Haverhill, intersecting the southern terminus of the A143 at a roundabout to the south-east of the town. It continues south-eastwards to terminate at a roundabout with the A131 Chelmsford-Sudbury road, just north of Braintree, approximately 23.5km from the proposed development site.

4.10 Chalkstone Way is a small local road that serves the north-eastern suburbs of Haverhill. It commences at a T-junction with the A143 Haverhill Road and skirts existing residential areas, terminating after approximately 2km at a mini-roundabout with the A143 Sturmer Road.

Existing Sustainable Facilities and Services

Pedestrians and Cyclists

4.11 At present the proposed development site does not contain any significant generators of pedestrian or cycle trips. As such, historically there has been no requirement to provide dedicated walking and cycling links into the site. There are intermittent footways within the local road network with cycle trips predominantly catered for within the highway. There are no substantial dedicated cycling facilities.

Public Rights of Way

4.12 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.

4.13 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.

4.14 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

4.15 The figure below highlights the PRoW that are closest to the site. This illustrates that there is a network of bridleways and footpaths that cross the site and connect with bridleways that penetrate other roads in the vicinity of the site.

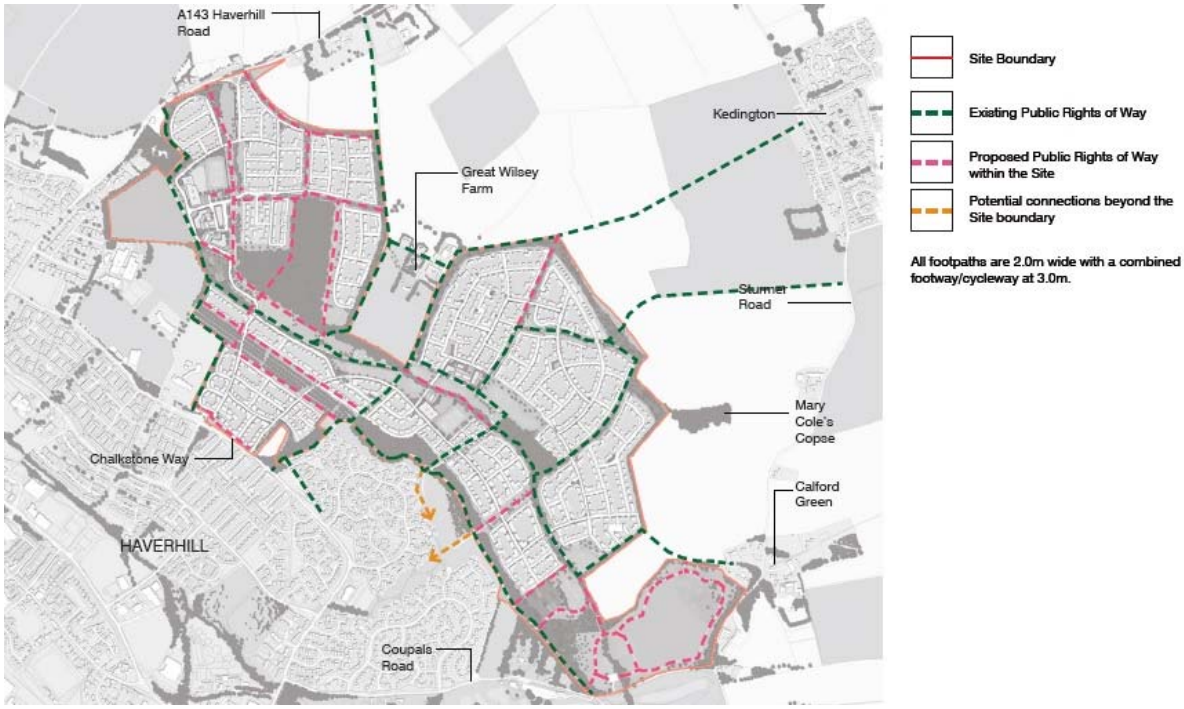


Figure 4g: On site Public Right of Way

Public Transport – Road

4.16 Numerous public transport routes operate across Haverhill. Those that operate adjacent to the proposed site are indicated below:

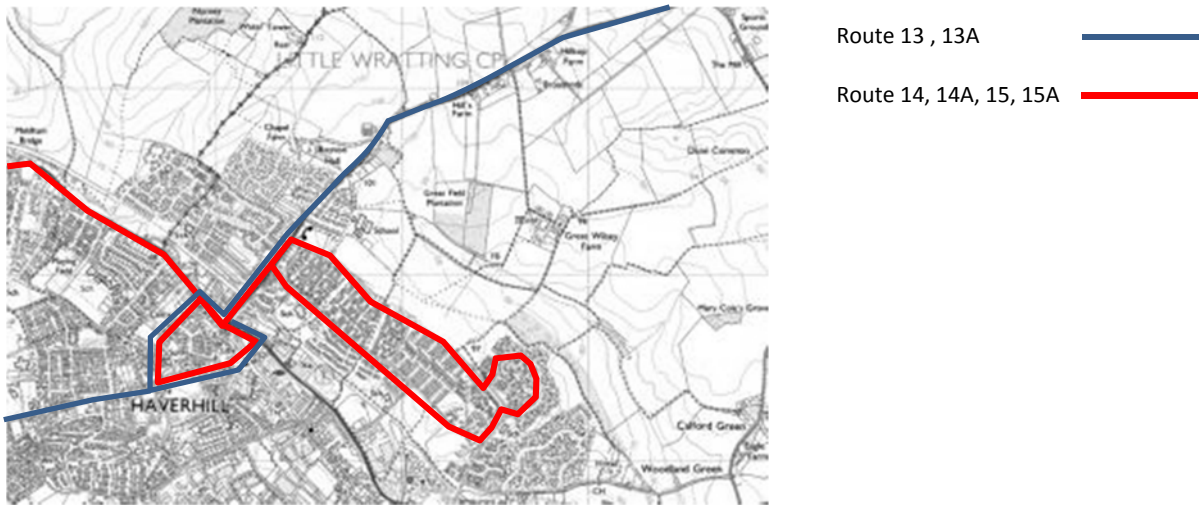


Figure 4h: Bus Routes operating close to the development

4.17 The bus services 13 and 13A are routes managed by Stagecoach and operate between Haverhill, Linton and Cambridge, Monday to Sunday. The first bus leaves Haverhill Bus Station at 05:38. The last bus reaches Haverhill Bus Station at 00:05. This service operates typically every half hour on Saturdays and every hour on Sundays.

4.18 The bus services 14, 14A, 15 and 15A are routes managed by Stephensons of Essex and operate between Haverhill, Chedburgh and Bury St Edmunds, Monday to Sunday. The first bus leaves Haverhill Bus Station at 06:15. The last bus reaches Haverhill Bus Station at 00:05. This service operates typically every hour.

4.19 In addition, a school bus service run by Stephensons of Essex – Bus Service HL025 runs between Haverhill and Poslingford from Monday to Friday. The first bus arrives at the Haverhill Bus Station at 08:37 and leaves the Haverhill Bus Station at 14:50. This service operates twice a day.

4.20 Another school bus service run by Stephensons of Essex – Bus Service HL351 runs between Haverhill and Great Bradley from Monday to Friday. The first bus arrives at the Haverhill Bus Station at 08:37 and leaves the Haverhill Bus Station at 14:50. This service operates twice a day.

4.21 The bus station provides waiting areas, toilets and is located circa 50m to the north-east of Haverhill High Street.

Public Transport – Rail

4.22 The closest main railway station is located in the centre of Cambridge. The train station provides a range of facilities including:

- 374 space car park open 7 days of the week
- 896 cycle storage spaces
- Taxi rank in front of station
- Ticket office open 7 days of the week
- Self-service ticket office
- Manned help desk
- Cash machine
- Public Wi-fi
- Pay phones
- Post box
- Refreshments with Shops
- Toilets with baby changing facilities
- Waiting rooms

4.23 Cambridge Railway Station provides the following services:

- Four routes per hour to London Kings Cross with a journey time of circa 48 minutes.
- One route per hour to London Liverpool Street with a journey time of circa 1 hour and 10 minutes.
- One route per hour to Birmingham New Street with a journey time of circa 2 hours 37 minutes.
- One route per hour to Stansted Airport with a journey time of circa 30 minutes
- Two routes per hour to Norwich with a journey time of 1 hour and 18 minutes.

4.24 There are a range of local stations that are closer to the proposed site, including Great Chesterford which contains the most facilities after Cambridge. This train station facilities include:

- 16 cycle storage spaces
- Ticket office open Monday - Friday
- Ticket Machine
- Public Wi-fi

4.25 Great Chesterford Railway Station provides the following services:

- Hourly to London Liverpool with a journey time of circa 1 hour and 10 minutes
- Hourly to Cambridge with a journey time of circa 16 minutes.

Accident Review

4.26 Data has been obtained from Suffolk Police for all recorded personal injury road accidents (PIAs) occurring during a five year period for the A143, A1017 and all other roads in the vicinity of the site. The accident review included the majority of Haverhill, locations reporting a significant accident record is indicated below.

Figure 4i: Area to be covered in Accident Study

4.27 A total of 66 accidents are recorded which are summarised below, resulting in 96 casualties. One accident resulted in fatal injury to a motorcyclist. A further 9 accidents resulted in serious injury.

	Number of PIAs				Casualties
	Slight	Serious	Fatal	Total	
Year 1 to end Nov'10	12	6	0	18	24
Year 2 to end Nov'11	16	1	0	17	23
Year 3 to end Nov'12	11	1	0	12	19
Year 4 to end Nov'13	14	1	0	15	25
Year 5 to end Nov'14	3	0	1	4	5
5 year period total	56	9	1	66	96

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

4.28 A notable statistical outlier relates to the high proportion of rear end shunts, making up 31.8% of all accidents.

4.29 Other notable factors are that 30 of the accidents (representing 45.5%) involved at least one young driver or rider aged 23 years or under and that 31.3% of the accidents involved vulnerable road users i.e. pedestrians and the riders of 2-wheeled vehicles. The numbers of such accidents are listed below.

	Number of PIAs				
	Under 17	17-18	19-20	21-23	TOTAL
Pedal cyclist	6	0	1	1	8
Motor cyclist	1	0	0	1	2
Car/LGV driver	0	7	6	7	20
HGV 7.5t	0	0	0	0	0
5 year period total	7	7	7	9	30

Figure 4k: PIAs involving young drivers/riders

	Number of PIAs			
	Pedestrian	Pedal cyclist	Motorcyclist	Total
Year 1 to end Nov'10	1	2	4	6
Year 2 to end Nov'11	0	5	2	7
Year 3 to end Nov'12	1	2	1	4
Year 4 to end Nov'13	3	0	2	5
Year 5 to end Nov'14	0	3	1	4
5 year period total	5	12	10	26

Figure 4l: PIAs involving at least one vulnerable road user

4.30 For the purpose of more detailed analysis, the accidents have been split by area and shown in the table below. Significant clusters within each area have then been identified and studied in greater detail. These have been compared against expected accident rates from COBA for that particular type of road layout and volume of traffic.

	Slight	Serious	Fatal	Total	Casualties
Area 1 – A143 Haverhill Road	18	2	0	20	37
Area 2 – A143 Ehringshaushen Way /Sturmer Road	16	1	0	17	21
Area 3 – A1307 Withersfield Road /Cambridge Road	15	2	0	17	21
Area 4 – A1017 Haverhill Bypass	6	5	1	12	17
5 year period total	55	10	1	66	96

Figure 4m: All PIAs by area

Area 1 – A143 Haverhill Road

4.31 This area of the road network covers the whole of the A143 Haverhill Road between Broadlands Hall and Cangle Junction in Haverhill Town Centre, and is shown as "Area 1" on Figure 4i.

4.32 A total of 20 PIAs are recorded at this location during the 5-year study period, equivalent to 4.0 PIAs per annum. Of these, none resulted in fatal injury but two resulted in serious injury, one of which was to a motorcyclist.

4.33 There were a total of 37 casualties, averaging 7.4 per PIA.

4.34 The number of accidents per annum expected along a road of this type and traffic level based upon COBA parameters would be 7.4 PIAs per annum which compares with an observed rate of 4.0. This suggests that the road is performing marginally better than might be expected, therefore overall the results reported give no particular cause for concern.

4.35 The only notable feature of the accidents is that 10 or 50% of the accidents involved rear end shunts. All of these occurring between the T-junction with Millfields Way and the roundabout with the A143 Ehringshausen Way.

Area 2 – A143 Ehringshaushen Way / Sturmer Road

4.36 This area of the road network covers the whole of the A143 Ehringshausen Way with Sturmer Road between the Cangle Junction roundabout in Haverhill Town Centre, and the roundabout with the A1017 Haverhill Bypass to the south-east of Haverhill and is shown as "Area 2" on Figure 4i.

4.37 A total of 17 PIAs are recorded at this location during the 5-year study period, equivalent to 3.4 PIAs per annum. Of these, one resulted in serious injury to a cyclist.

4.38 There were a total of 21 casualties, averaging 4.2 per PIA.

4.39 The number of accidents per annum expected along a road of this type and traffic level based upon COBA parameters would be 7.4 PIAs per annum which compares with an observed rate of 3.4. This suggests that the junction is performing marginally better than might be expected, therefore overall the results reported give no cause for concern.

4.40 The only notable feature of the accidents is that 11 or 52.4% of the accidents involved vulnerable road users.

Area 3 – A1307 Withersfield Road / Cambridge Road

4.41 This area of the road network covers the whole of the A1307 Withersfield Road leading into Cambridge Road between the Cangle Junction roundabout in Haverhill Town Centre, and the roundabout with the A1017 Haverhill Bypass to the north-west of Haverhill, and is shown as "Area 3" on Figure 4i.

4.42 A total of 17 PIAs are recorded at this location during the 5-year study period, equivalent to 3.4 PIAs per annum. Of these, two resulted in serious injury to a pedestrian, a cyclist and a motorcyclist.

4.43 There were a total of 21 casualties, averaging 4.2 per PIA.

4.44 The number of accidents per annum expected along a road of this type and traffic level based upon COBA parameters would be 7.4 PIAs per annum which compares with an observed rate of 3.4. This suggests that the road is performing marginally better than might be expected, therefore the results reported give no particular cause for concern.

Area 4 – A1017 Haverhill Bypass

4.45 This area of the road network covers the whole of the A1017 Haverhill Bypass between the roundabouts to the north-west and south-east of Haverhill, and is shown as "Area 4" on Figure 4i.

4.46 A total of 12 PIAs are recorded at this location during the 5-year study period, equivalent to 2.4 PIAs per annum. Of these, one resulted in fatal injury and serious injury, seven to motorcyclists.

4.47 There were a total of 17 casualties, averaging 3.4 per PIA.

4.48 The number of accidents per annum expected along a road of this type and traffic level based upon COBA parameters would be 8.4 PIAs per annum which compares with an observed rate of 2.4. This suggests that the road is performing better than might be expected, therefore overall the results reported give no particular cause for concern.

Accident Summary

4.49 66 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 rear shunt type accidents, and in several cases, accidents involving vulnerable road users, although this is not necessarily atypical of urban roads serving a mixture of purposes in a living environment.

4.50 The area has been split into several sections for further analysis and the numbers of accidents reported has been compared with statistics indicating expected rates for each type of road or junction given observed traffic levels. Overall the accident record appears to be quite good with observed figures generally below the equivalent expected rate.

4.51 To summarise, there are no notable safety issues that will remain unaddressed by the current development proposals. Although the development will add traffic to the network there is no reason to suppose that this will significantly compromise the relatively safe performance 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 dependant 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 2017. Furthermore, through discussion with SCC it has been agreed that the assessment years would be 2019, 2024 and 2029.

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.

Phasing of Great Wilsey Park

5.5 There are two highway factors affecting the phasing of the proposed development. The first is the timing of the NWRR and the additional highway capacity it creates (as indicated in Policy HV4). The second is the timing of the access points into the proposed development site itself.

5.6 To assess the implications of the proposed development without the NWRR a series of Scenarios/Tests have been modelled (see Chapter 8 of this TA and Chapter 4 of the scoping note in Appendix A). This modelling has shown that there is sufficient highway capacity for approximately 1,000 dwellings to be completed, split between the North West Haverhill site and Great Wilsey Park in advance of the NWRR. This highway capacity can be created through various changes to junctions in Haverhill which are currently at or close to capacity. These are set out in Chapters 9, 10 and 11.

5.7 As indicated in chapter 2, BCL have held detailed discussions with SCC over an extended period of time. These discussions confirmed that a total of 1000 units split between the NWGA and Great Wilsey Park is likely to be acceptable, prior to the completion of the NWRR.

5.8 In terms of the second highway factor affecting phasing, two points of highway access into the site are proposed:

Figure 5a: Broad Site Access Locations

5.9 It is anticipated that the proposed development will be constructed from the west towards the east, starting at the Haverhill Road junction.

5.10 For further development to occur, the second access from Chalkstone Way is required. It is anticipated that ths would be constructed in 2018/19.

5.11 The third access point that will only ccess the car park sociated with the Country Park, will be delivered in parallel with the timing of the Country Park.

5.12 It is anticipated that all offsite junction improvements set out in Chapters 9 and 10 would be implemented sequentially between 2017 and 2019 by SCC.

5.13 Following completion of the NWRR it is anticipated that the site would be built out over a rate of approximately 15 years, which equates to approximately 200 dwellings per annum.

Access Strategy

5.14 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 SEBC 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.

5.15 To enable an initial phase of development, it is envisaged a single point of access will be established off the A143 Haverhill Road. There is sufficient highway frontage onto the A143 to enable delivery of a suitable designed point of access. At the time of writing, it is envisaged that a roundabout would provide the most appropriate junction, as indicated below.

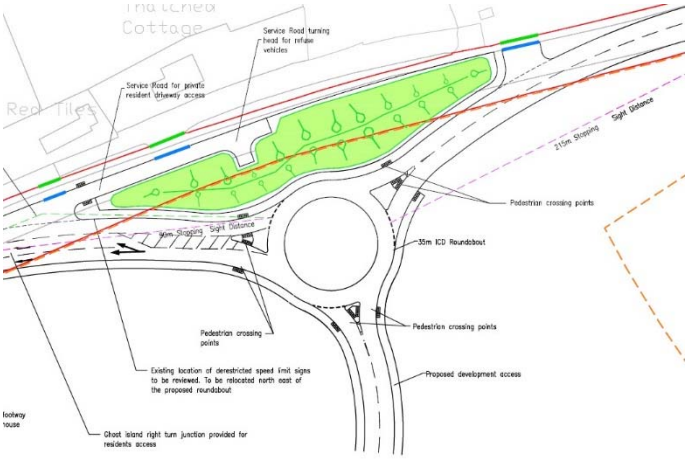


Figure 5c: Northeast Growth Area – Potential A143 access arrangements

5.16 The opportunity to provide links to Chalkstone Way is available to facilitate future phases of development. BCL has carefully considered the available options and developed preliminary general arrangement details, which have been provided to the Highway Authority.

5.17 The potential layouts are indicated below, illustrating a signalled junction. This option has been discussed initially with the Highway Authority, indicating that access from Chalkstone Way is acceptable.

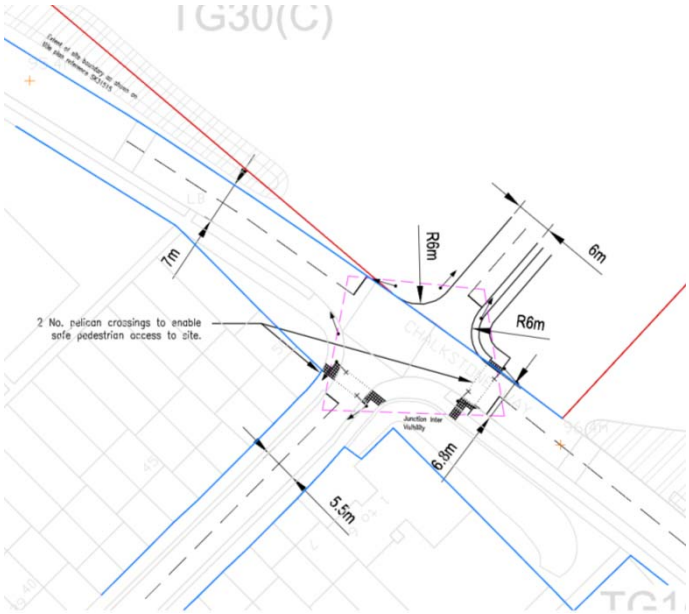


Figure 5d: Potential access onto Chalkstone Way – signalled layout

5.18 The delivery of the additional point of access enablesthe entire development to be competed.

5.19 The third access from Coupals Road serving only the Country Park car park, shall be a priority junction. This option has been discussed initially with the Highway Authority, indicating that this access arrangement is acceptable.

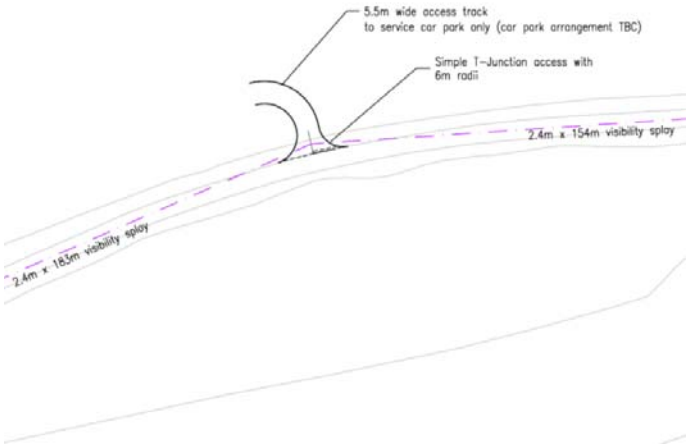


Figure 5e: Potential access onto Coupals Road – priority junction layout

5.20 With this link in place, it is then possible to provide an access to the proposed car park for the Country Park within the development.

Internal Highway Network

5.21 Within the site, the parameters plan proposes a street network with a clear hierarchy. This is descried below:

- Primary route: The design speed for the internal street is based on a speed limit of 30 MPH although the aspiration of the development is to achieve lower speeds through careful design of the streetscape and public realm. These routes will be designed to cater for public transport vehicles. The purpose of the primary routes is to distribute the traffic on to the secondary routes, keeping the main link free flowing. 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 30 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

5.22 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

5.23 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

5.24 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

5.25 The 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 would include a segregated walking / cycling route adjacent to the primary routes throughout 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.

5.26 There are several Public Rights of Way across the site, these will be incorporated within the site masterplan and will be maintained such that there will not be a need for any diversions. To encourage walking and cycling these routes through the site will be enhanced to ensure that there are no barriers to movement. 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 lit tarmacked routes and in less built up areas more low engineered surfacing to be, including bonded gravel.

5.27 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.

5.28 The strongest desire line for walking and cycling is southbound. The established peak hour car based trips of 1,608 can be used to determine the likely pedestrian/cyclist demands using census data. The 1,608 car based trips divided by the modal split of 0.643 provides a total of 2,501 trips. Pedestrian / cyclist trips represent 0.021 of the total trips, equating to 53 walking and cycling trip in the peak hour. This demand demonstrates the need for a strong walking and cycling network, which has been incorporated into the proposals.

5.29 The onsite network will connect into the external walking and cycling networks that includes the PRoW network. The predominant walking and cycling desire line towards Haverhill is to be fully incorporated into the links from the development. Currently, there is a high quality walking and cycling link adjacent to the A143 Haverhill Road and Chalkstone Way to connect Great Wilsey Park with Haverhill Town Centre. This will ensure that trips into Haverhill can be carried out. The walking and cycling strategy plan is attached in Appendix D.

Road Based Public Transport Provision

5.30 To maximise the opportunities to travel by public transport, it is proposed to improve the current routes that operate in Haverhill. The options to deliver public transport enhancements have been discussed with SEBC and the local bus operators.

5.31 Presently, several routes operated by Stagecoach and Stephensons of Essex pass adjacent to the site boundary. It has been discussed that both of the existing routes are unsuitable for serving the proposed development.

5.32 The long term viability of any public transport route is critical if it is serve the community into the future. Therefore discussions with Stagecoach and Stephensons of Essex have established the likely level of revenue that could be generated by the development, which can be offset by the likely costs to understand the viability. As a result of this work, financial support is likely to be needed initially, but over time it is expected that patronage levels will be sufficient to safeguard the long term viability of the proposed public transport interventions.

5.33 Initial contact was made in February 2015 to discuss possible improvements to public transport in Haverhill with the local operators. This identified that the preferred solution provides a 30 minute service from Great Wilsey Park into Haverhill town centre. Passengers can then change onto routes 13/13A to get to Sainsbury's or into Cambridge. This will require one additional vehicle and the first years estimated cost for providing this service will be circa £120,000.

5.34 It is considered that the required contribution will decrease as the development is delivered, such that the public transport enhancement will be self-funding after the fifth / sixth year.

Parking Provision

5.35 SEBC has published guidance on parking standards, in which dwellings having four or less bedrooms shall have two spaces with all other dwellings having three spaces. This guidance was before the publication of NPPF, which at 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

5.36 The application is submitted in outline and parking numbers can be refined / defined at reserved matters stage. The parking strategy will however, reflect the primary focus of the transport strategy which primarily seeks to target mode shift away from private car use. A flexible approach to parking design and provision will be adopted, through a provision of on-street, on-plot, courts and individual garages. At the time of writing it is envisaged that the parking provision will be delivered through a mix of allocated and unallocated parking with the SEBC guidance on parking provision treated as maximum standards.

5.37 It is anticipated that every dwelling will have access to safe, secure cycle parking. It is assumed that garages, where provided, will provide suitable cycle parking and for the dwellings without garages, it is anticipated that secure facilities will be provided either within the building or in rear gardens.

6 Development Impact Appraisal

Impact Appraisal

6.1 The DfT Guidance on Transport Assessment of March 2007 requires TA's to consider 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 Various employment opportunities are located in close proximity to the site, including Maple Park Industrial Estate that comprises a site area of 22.6 Ha, and Hollands Road Industrial Estate that comprises a site of 81.6Ha. Other key employment destinations include the Ehringshausen Way Retail and Leisure Park, Haverhill Town Centre together with further job opportunities further afield in the larger towns such as Cambridge, Braintree, Bury St Edmunds and Colchester. These offer a wide range of employment opportunities for the future residents.

6.5 Although two primary schools are proposed as part of the development, the nearest primary school is Westfield Community Primary School. Samuel Ward Academy offers nearby secondary education.

6.6 Existing healthcare is available at the Christmas Maltings & Clements and Stourview Doctors practice in Haverhill Town Centre. A healthcare facility is also proposed as part of the development.

6.7 The site is therefore well located to make use of a wide variety of local facilities and amenities.

6.8 The distance to the key destinations, measured from the site accesses on Haverhill Road or Chalkstone Way, is indicated in Figure 6a, with the location indicated in Figure 6b.

Employment	Approx Distance from proposed Site entrance (km)	Meet 2km Target Walk?	Approx Walk Time (mins)	Meet 5km Target Cycle?	Approx Cycle Time (mins)
1. Samuel Ward Academy – 11 to 18 years	1.1km	✓	14	✓	4
2. Westfield Community Primary School	0.8km	✓	10	✓	3
3. Haverhill Bus Station	1.5km	✓	18	✓	6
4. Haverhill Town Centre	1.8km	✓	22	✓	7
5. The Christmas Maltings & Clements Doctors practice	1.7km	✓	21	✓	7
6. Tesco Supermarket	1.6km	✓	20	✓	6
7. Ehringshausen Way Retail and Leisure Park	1.5km	✓	18	✓	6
8. Maple Park Industrial Estate	1.6km	✓	20	✓	6
9. Hollands Road Industrial Estate	2.6km		32	✓	10
10. Castle Manor Business and Enterprise College– 11 to 18 years	2.4km		30	✓	9
11. Stourview Medical Practice	1.7km	✓	21	✓	7

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

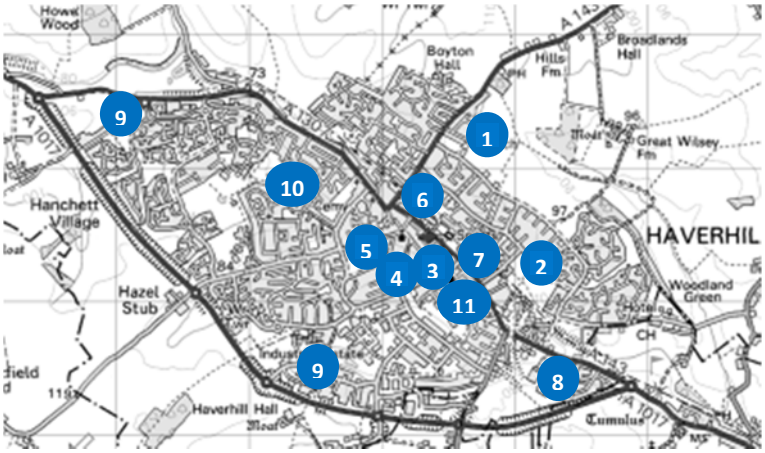


Figure 6b: Local facilities

6.9 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 below provides a graphical representation of the 2km walking and 5km cycling isochrones, within 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.

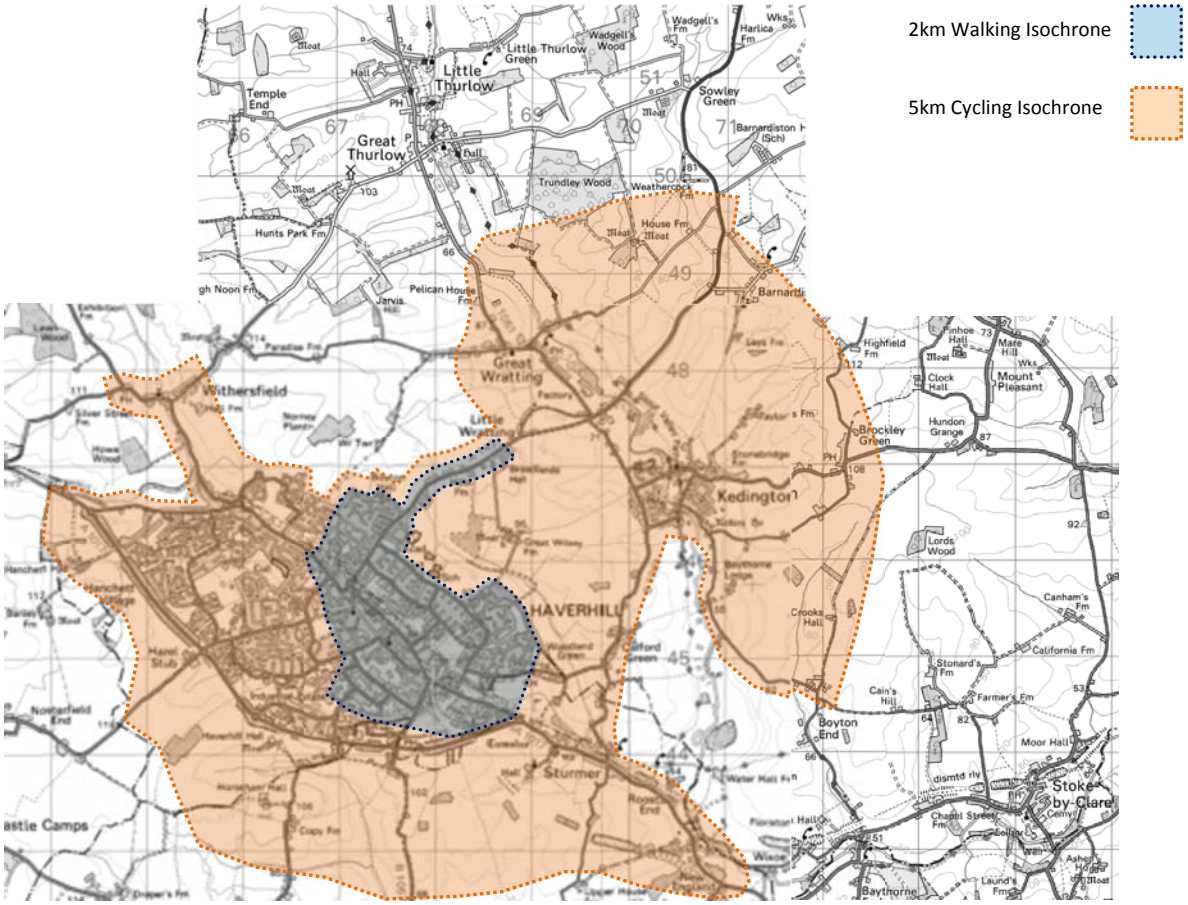


Figure 6c: Walking and Cycling Isochrones

Safety

6.10 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:

1. 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.
2. 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. A Stage One Road Safety Audit can be completed with regards to the site access to ensure compliance with the relevant applied design standards.

Economy

6.11 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.

6.12 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.

6.13 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.

6.14 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.

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

Environment

6.16 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.

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

Integration

6.18 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'.

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

6.20 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.

6.21 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

6.22 This section of the TA demonstrates that the proposed development site has a wide range of locational advantages in terms of site accessibility.

6.23 The site is in close proximity to Haverhill, 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.

6.24 The development site will have excellent walking and cycling links into Haverhill. 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 TA is accompanied by a Travel Plan (TP), contained in the Appendix. The TA should be read in conjunction with the TP to fully understand the overall transport strategy for the site. The TP has formed the basis for the sustainable transport strategy and TP for the proposed development. The TP will establish the overarching principles to be applied to ensure that the final TP will maximise modal shift. The TP was produced in discussion with SCC.

7.3 A summary of the TP is provided below.

7.4 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.

7.5 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

7.6 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

7.7 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.

7.8 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

7.9 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.

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

7.11 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

7.12 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.

7.13 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.

7.14 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.

8.3 **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 operation the future. These models are computer simulations using software like Paramics, VISSIM or Saturn and can be expensive to establish.

8.4 **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.

8.5 The TA that accompanied the North West development planning application used the traditional method as there is no formal traffic model covering Haverhill, with this approach being acceptable to SCC. Therefore, a similar traditional approach to assess the proposed development has been used, as described below.

8.6 In addition to this, a VISSIM model has been produced to assess the potential impact on the Cangle junction, with further details provided below.

Base Line Traffic Scenario

8.7 Existing traffic flows on the network in the vicinity of the proposed development have been obtained and used as the basis for the TA.

8.8 Newly commissioned classified turning counts were carried out at the locations indicated below and highlighted in the Figure below. These locations for traffic flows are considered as the immediate junctions within the surrounding road network that the development is likely to impact, in terms of traffic.

- Location 1 – A1017 / A1307
- Location 2 – Howe Road / A1307
- Location 3 – Haverhill Road (A143) / Chalkstone Way
- Location 4 – Chalkstone Way / Sturmer Road (A143)
- Location 5 – A143 / A1017
- Location 6 – Water Lane (B1061) / A1017
- Location 7 - Water Lane (B1061) / Coupals Road
- Location 8 - Chalkstone Way / Coupals Road
- Location 9 - Manor Road / A143
- Location 10 – Cangle junction
- NWRR junctions (yet to be constructed)

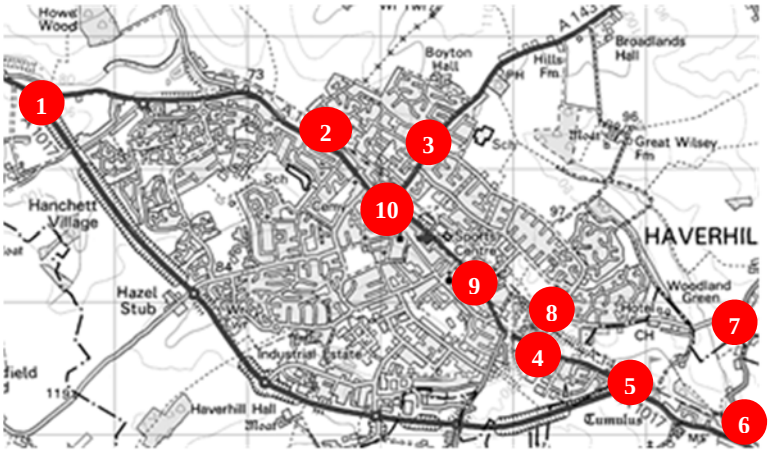


Figure 8a: Traffic survey locations

Future Traffic Assessment & Growth Scenarios

8.9 To assess the propensity for background growth, Tempro growth forecasts were investigated, this indicated the following growth:

- 2014 Households = 10,720
- 2019 Households = 11,490 reflecting an increase of 770 dwellings
- 2024 Households =12,277 reflecting an increase of 1,557 dwellings
- 2029 households = 13,048 reflecting an increase of 2,328 dwellings

8.10 This demonstrates that the combination of both the proposed development and the North West development will deliver housing over and above that identified within Tempro, therefore any inclusion of background will result in double counting. On this basis, the assessment will not include any assumptions for background growth.

8.11 Traffic growth is also a factor of the creation of jobs. Therefore Tempro was interrogated to understand the background traffic growth levels with all of the housing growth assumptions removed. The result is indicated below.

	Urban	Rural	All	Urban	Rural	All
	2014-2019			2014-2019		
Motorway	-	1.071	1.067	-	1.034	1.031
Trunk	1.071	1.078		1.034	1.041	
Principal	1.060	1.063		1.024	1.027	
Minor	1.060	1.063		1.024	1.027	
All	1.063	1.071		1.027	1.034	
	2014-2024			2014-2024		
Motorway	-	1.160	1.150	-	1.084	1.075
Trunk	1.155	1.176		1.080	1.099	
Principal	1.134	1.142		1.060	1.067	
Minor	1.133	1.141		1.059	1.067	
All	1.141	1.159		1.067	1.084	
	2014-2029			2014-2029		
Motorway	-	1.238	1.219	-	1.123	1.106
Trunk	1.226	1.251		1.112	1.135	
Principal	1.197	1.206		1.086	1.094	
Minor	1.203	1.212		1.092	1.100	
All	1.209	1.230		1.097	1.115	

Figure 8b: AM Peak Background Traffic growth from Tempro

	With All Housing Growth			With No Housing Growth		
	Urban	Rural	All	Urban	Rural	All
	2014-2019			2014-2019		
Motorway	-	1.074	1.070	-	0.969	0.966
Trunk	1.074	1.081		0.970	0.976	
Principal	1.063	1.067		0.959	0.963	
Minor	1.063	1.067		0.960	0.963	
All	1.067	1.074		0.963	0.969	
	2014-2024			2014-2024		
Motorway	-	1.168	1.158	-	1.053	1.044
Trunk	1.164	1.184		1.049	1.067	
Principal	1.142	1.150		1.029	1.037	
Minor	1.141	1.149		1.029	1.036	
All	1.149	1.167		1.036	1.052	
	2014-2029			2014-2029		
Motorway	-	1.253	1.233	-	1.128	1.111
Trunk	1.241	1.266		1.117	1.140	
Principal	1.212	1.221		1.091	1.099	
Minor	1.218	1.227		1.096	1.105	
All	1.223	1.244		1.101	1.120	

Figure 8c: PM Peak Background Traffic growth from Tempro

8.12 Therefore based on the above, the following growth rates based on the Urban Principal road type are to be adopted.

- 2014 to 2019 AM peak – 1.024
- 2014 to 2019 PM peak – 0.959
- 2014 to 2024 AM peak – 1.060
- 2014 to 2024 PM peak – 1.029
- 2014 to 2029 AM peak – 1.086
- 2014 to 2029 PM peak – 1.091

Committed Development

8.13 The only committed development to be taken into account in the assessment is the North West development and NWRR. This has been characterised using the same 2011 Census data as that applied to the proposed development, see Chapter 4.

Trip Generation

8.14 The TRICS database was used to estimate the likely trip rates generated by the proposed development. The proposed development is anticipated to provide up to 30% affordable housing, which needs to be reflected in the assessment due to the corresponding reduced car based trips.

8.15 Through initial scoping discussions, employment trip rates were suggested. These were subsequently revised following the comments received from SCC. It should be noted that the employment land is a minor element of the wider development.

8.16 This resulted in the following trip rates:

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way

Trip Rates per dwelling-private	0.179	0.443	0.622	0.426	0.262	0.688
Trip Rates per dwelling-social	0.131	0.252	0.383	0.275	0.188	0.463
Primary Schools	0.351	0.237	0.588	0.006	0.027	0.033
Employment – 100 sq.m	1.225	0.198	1.423	0.212	1.151	1.363

Figure 8d: Development Trip Rates; TRICS

8.17 The development will deliver houses for the open market together with affordable / social housing. The current Planning Policy indicates that up to 30% of affordable housing should be provided. In determining the Trip Rates for the residential element, these were based on 80% private and 20% rented. Hence the final trip rates will have 20% of the final development as affordable or social housing. The split of 80/20 was derived to provide a robust case when testing trip generation, as a lower assumption on rented accommodation results in increased trips. This will therefore result in the following blended residential trip rates.

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Resultant Residential trip rate	0.169	0.405	**0.574**	0.396	0.247	**0.643**

Figure 8e: Resultant housing trip rates

8.18 The proposed development will deliver complimentary land uses, including local centre facilities. These will serve the demands of the proposed development and as such are anticipated to generate only negligible external trips. Therefore the only external trips will be those generated by the residential element of the development.

8.19 Based on the above trip rates, the figure below identifies the total number of vehicle trips generated by the development, based on 630 primary school places provided. This assumes that there will be three form entries, with each form taking 30 children over a seven year period (i.e. 30 * 7 * 30 = 630).

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 2,500 units	423	1,013	1,435	990	618	1,608
Primary Schools (630 spaces)	221	149	370	4	17	21
B1 Employment – 3000 sq.m	37	6	43	6	35	41

Figure 8f: Total vehicle trips

Internalisation

8.20 The proposed development will deliver a complementary mix of land uses that will reduce the number of trips exiting the development. The proposed development will deliver a total of 630 primary school places. It is likely that the vast majority of these places will be filled by children from this development, and therefore will only generate negligible external trips.

8.21 To determine the likely demand on school places Census statistics have been reviewed.

8.22 This indicates that in 2011 there were 3,079 households in the Haverhill East Ward, resulting in 604 primary school age children, equivalent to 0.197 child per house.

8.23 Therefore it is considered that 493 primary school age children will be generated by the development.

8.24 These calculated trips are directly linked to the available school places and would be internal or part of the housing trip generation. The remainder of the school places (630 – 493 = will therefore be treated as more external trips, as indicated below – applying the Primary School trip rates found above. This methodology was agreed through the Scoping Note. At

the time of writing, this is considered robust, as in all likelihood the development could generate more demand for primary school places than indicated here.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
School external trips – 137 place	48	33	81	1	4	5

Figure 8g: External Vehicle School trips

8.25 The figure below quantifies the external trips.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 2,500 units	423	1013	1435	990	618	1608
Primary Schools	48	33	81	1	4	5
Employment – 3000 sq.m	37	6	43	6	35	41

Figure 8h: Total external vehicle trips

8.26 It should be noted that there has been no reduction in external trips between the complimentary employment and housing land uses. Therefore, this represents a robust assignment.

Trip Distribution and Assignment

8.27 The initial aim was to distribute the generated traffic to the road network utilising the same distribution as per the North West development TA. However, a review against 2011 Census travel to work data indicated a notable difference. Therefore, as per the Scoping Note (Appendix A), the Census data will take precedent.

Trip Diversion

8.28 The delivery of the NWRR will provide an alternative route for trips between the A1307 to the west and the A143 to the north. The application for the North West development assumed that 50% of the trips would divert from the Cangle junction. This same percentage has been assumed.

Assessment Scenarios

8.29 The Scoping note provided details on the likely assessment scenarios. These were identified prior to the commencement of the detailed assessments. The scenarios have been subsequently updated following completion of the detailed junction review.

8.30 The assessment scenarios reflect the anticipated development trajectory for both Great Wilsey Park and the permitted North West Haverhill development, and the early release of some development prior to completion of the NWRR. The initial phases of both Great Wilsey Park and the North West Haverhill development are assumed to be 500 dwellings each. However, the 1,000 dwellings can be split between the two developments in any way without having a detrimental effect on the local road network.

Junction Assessments

8.31 The junctions shown in Figure 8a have largely been assessed using traditional packages of Arcady, Picady or Linsig as appropriate. The results of these assessments are identified in Chapter 9. However, through initial discussions with SCC it is clear that the key concern is the Cangle Junction. Therefore to assess the potential impact on this junction, including those junctions adjacent to Cangle junction, has been assessed through a VISSIM micro-simulation traffic model, as reported in Chapter 10.

8.32 The VISSIM model includes the following junctions:

- Cangle junction
- A143 / Chalkstone Way
- A143 / Lady Croft Lane
- Tesco roundabout
- Pedestrian crossing points

8.33 The scope of the VISSIM model was agreed through discussion with SCC. The agreed Scoping Note is contained in Appendix A.

9 Road Network Review – Junction Assessments

Junction Assessment Introduction

9.1 Thic chapter assesses those junctions assessed by the agreed traditional method of assessment. The junctions associated with Cangle Junction are assessed through the use of Micro-simulation and is reported in Chapter 10.

9.2 Priority controlled T-junctions and roundabouts are assessed using the computer software packages PICADY and ARCADY, respectively, with signal controlled junctions assessed by the LINSIG software package. The junction capacity output of 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

9.3 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.

9.4 PICADY, ARCADY and LINSIG also report the expected average queue 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.

9.5 The junction assessment outputs are contained in Appendix G.

A1017/A1307

9.6 The current junction is a simple roundabout with A1307 Cambridge Road running to the north, A1307 Cambridge Road running to the east and the A1017 Haverhill Bypass to the south, as indicated in Figure 9a:

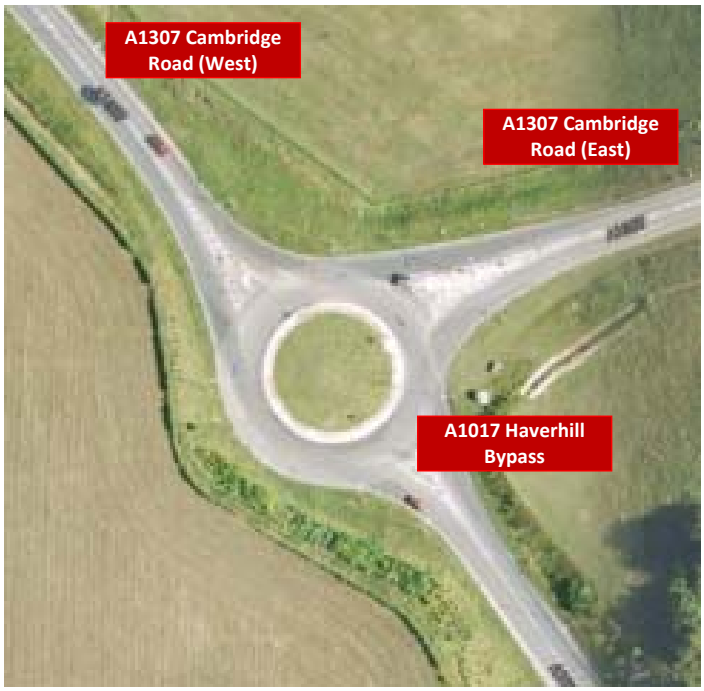


Figure 9a: A1017/A1307

9.7 The results of the Arcady assessment, based on demand flows, as attached in Appendix G, are indicated below. The results indicated below report the 2019 assessment year with phase 1 of Great Wilsey Park and the NWGA.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1307 Cambridge Road (West)	0.377	2	0.877	6
A1017 Haverhill Bypass	0.559	2	0.269	1
A1307 Cambridge Road (East)	0.628	1	0.314	1

Figure 9b: Arcady results – A1017/A1307 junction, 2019 phase one development of Great Wilsey Park and the NWGA

9.8 The above table identifies that the junction operates largely within acceptable thresholds, with the highest RFC predicted to be 0.877, with a corresponding maximum queue of 6 vehicles. This demonstrates that the for the initial phase of development, the impact at the junction cannot be classed as severe against NPPF and therefore no mitigation will be required during the initial phase.

9.9 The 2029 results with full development on both the Great Wilsey Park and the NWGA are presented below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1307 Cambridge Road (West)	0.457	1	1.127	121
A1017 Haverhill Bypass	0.816	4	0.354	1
A1307 Cambridge Road (East)	1.003	19	0.570	1

Figure 9c: Arcady results – A1017/A1307 junction, 2029 with NWRR, queue length summary with completed Great Wilsey Park and the NWGA

9.10 This demonstrates that in 2029, the junction is predicted to exceed the normally acceptable thresholds of capacity. The results of the 2019 assessment indicates that the RFC is 0.877, suggesting that an intervention at this location will be required following the occupation of the 500th dwelling.

9.11 The roundabout is to be improved with the addition of a dedicated left-turn lane from A1307 Cambridge Road (West) into A1307 Cambridge Road (East) together with localised widening to improve the flare lengths on the approach arms, as indicated below.

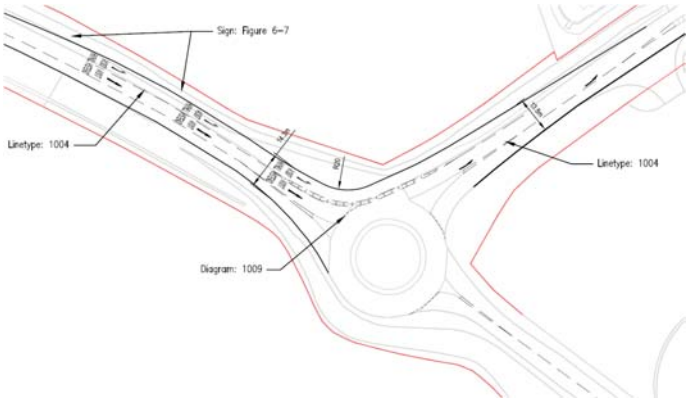


Figure 9d: Proposed Mitigation Measures for A1017/A1307 junction

9.12 This intervention has been tested with the results indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1307 Cambridge Road (West)	0.305	0	0.748	3
A1017 Haverhill Bypass	0.732	3	0.339	1
A1307 Cambridge Road (East)	0.843	5	0.482	1

Figure 9e: Arcady results – A1017/A1307 junction, 2029 with NWRR and roundabout improvements, queue length summary with full development of Great Wilsey Park and NWGA

9.13 The results indicate that the proposed intervention with improvements will operate satisfactorily for the development scenario.

Howe Road / A1307

9.14 The current junction is a simple signal-controlled T-junction with A1307 Withersfield Road running from east to west and Howe Road to the north, as indicated below.

Figure 9f: Howe Road / A1307

9.15 The results presented below of the Linsig assessment report the 2019 assessment year with phase 1 of Great Wilsey Park and the NWGA.

Link	AM Peak		PM Peak	
	Degree of Saturation	Max Queue	Degree of Saturation	Max Queue
Howe Road	67.8%	8	74.4%	5
A1307 Withersfield Road (East)	67.3%	14	54.4%	10
A1307 Withersfield Road (West)	58.1%	11	73.8%	19

Figure 9g: Linsig results – Howe Road / A1307, 2019 queue length summary with phase 1 of Great Wilsey Park and the NWGA.

9.16 This assessment above demonstrates that the junction operates within acceptable limits, with the highest degree of saturation reported to be 73.8%. this demonstrates that this junction does not require an intervention at phase 1.

9.17 The 2029 results, assuming the completion of Great Wilsey Park and the NWGA are presented below.

Link	AM Peak		PM Peak	
	Degree of Saturation	Max Queue	Degree of Saturation	Max Queue
Howe Road	53.2%	6	60.5%	4
A1307 Withersfield Road (East)	53.6%	9	47.1%	8
A1307 Withersfield Road (West)	51.6%	9	62.1%	14

Figure 9h: Linsig results – Howe Road / A1307, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.18 The results indicate that the proposed junction will operate satisfactorily for the development scenario, such that no mitigation is required. The results presented for the 2029 scenario report an improved junction performance than in 2019, this is as a result of the diversion of traffic onto the NWRR.

Chalkstone Way / Sturmer Road (A143)

9.19 The current junction is a simple mini-roundabout with A143 Rowley Hill running to the east, A143 Sturmer Road running to the west and Chalkstone Way to the north, as indicated below.

Figure 9i: Chalkstone Way / Sturmer Road (A143)

9.20 The results of the Arcady assessment, are indicated below. The results indicated below report the 2029 assessment year with the completed Great Wilsey Park and the NWGA.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Chalkstone Way	0.853	5	0.426	1
A143 Stumer Road	0.592	1	0.841	5
A143 Rowley Hill	0.523	1	0.778	3

Figure 9j: Arcady results – Chalkstone Way / Stumer Road (A143), 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.21 The results indicate that the existing junction will operate satisfactorily in 2029, assuming the completion of Great Wilsey Park and the NWGA. The junction operates satisfactorily in 2029 which represents the worst case and therefore the junction would operate satisfactorily in the 2019 scenario.

9.22 It is concluded that an intervention at this location is not required or justified.

A143 / A1017

9.23 The current junction is a simple roundabout with A143 Rowley Hill running to the west, A1017 Haverhill Bypass running to the south and the A1017 Rowley Hill to the east, as indicated below.

Figure 9k: A143 / A1017

9.24 The results of the Arcady assessment, are indicated below. The results indicated below report the 2029 assessment year with the completed Great Wilsey Park and the NWGA.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A143 Rowley Hill	0.233	0	0.348	1
A1017 Rowley Hill	0.492	1	0.341	1
A1017 Haverhill Bypass	0.162	0	0.339	1

Figure 9l: Arcady results – A143 / A1017, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.25 The results indicate that the existing junction will operate satisfactorily in 2029, assuming the completion of Great Wilsey Park and the NWGA. The junction operates satisfactorily in 2029 which represents the worst case and therefore the junction would operate satisfactorily in the 2019 scenario.

9.26 It is concluded that an intervention at this location is not required or justified.

Water Lane (B1061) / A1017

9.27 The current junction is a simple t-junction with A1017 Rowley Hill running from east to west and the B1061 Water Lane to the north, as indicated below.

Figure 9m: Water Lane (B1061) / A1017

9.28 The results of the Picady assessment, based on the 2029 demand flows are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A1017 Rowley Hill (East)	0.236	0	0.301	0
B1061 Water Lane	0.303	1	0.147	0

Figure 9n: Picady results – Water Lane (B1061) / A1017, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.29 The results indicate that the existing junction will operate satisfactorily in 2029, assuming the completion of Great Wilsey Park and the NWGA. The junction operates satisfactorily in 2029 which represents the worst case and therefore the junction would operate satisfactorily in the 2019 scenario.

9.30 It is concluded that an intervention at this location is not required or justified.

Water Lane (B1061) / Coupals Road

9.31 The current junction is a simple t-junction with B1061 Water Lane running from north to south and Coupals Road to the west, as indicated below.

Figure 9o: Water Lane (B1061) / Coupals Road

9.32 The results of the Picady assessment, based on the 2029 demand flows, are presented below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
B1061 Water Lane (North)	0.190	0	0.271	0
Coupals Road	0.295	0	0.156	0

Figure 9p: Picady results – Water Lane (B1061) / A1017, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.33 The results indicate that the existing junction will operate satisfactorily in 2029, assuming the completion of Great Wilsey Park and the NWGA. The junction operates satisfactorily in 2029 which represents the worst case and therefore the junction would operate satisfactorily in the 2019 scenario.

9.34 It is concluded that an intervention at this location is not required or justified.

Chalkstone Way / Coupals Road

9.35 The current junction is a simple mini-roundabout with Chalkstone Way running from north to south and Coupals Road to the east, as indicated below.

Figure 9q: Chalkstone Way / Coupals Road

9.36 The results of the Arcady assessment, based on the 2029 demand flows, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Chalkstone Way (North)	0.481	1	0.306	0
Coupals Road	0.500	1	0.192	0
Chalkstone Way (South)	0.309	0	0.721	3

Figure 9r: Arcady results – Chalkstone Way / Coupals Road, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.37 The results indicate that the existing junction will operate satisfactorily in 2029, assuming the completion of Great Wilsey Park and the NWGA. The junction operates satisfactorily in 2029 which represents the worst case and therefore the junction would operate satisfactorily in the 2019 scenario.

9.38 It is concluded that an intervention at this location is not required or justified.

Manor Road / A143

9.39 The current junction is a simple mini-roundabout with A143 Lords Croft Lane running south, A143 Ehringshrausen Way running north and Manor Road to the east, as indicated below.

Figure 9s: Manor Road / A143

9.40 The results of the Arcady assessment, based on the 2019 phase 1 demand flows, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Manor Road	0.513	1	0.278	0
A143 Ehringshrausen Way	0.639	2	0.764	3
A143 Lords Croft Lane	0.599	2	0.687	2

Figure 9t: Arcady results – Manor Road / A143, 2019 queue length summary with Phase 1 of Great Wilsey Park & NWGA

9.41 This demonstrates that the junction operates satisfactorily in 2019 with phase 1 of both Great Wilsey Park and NWGA. This demonstrates that no mitigation is required to deliver the initial phases of development.

9.42 This junction has further been assessed in 2029 assuming the completion of both Great Wilsey Park and NWGA. The assessment results are presented below. The results demonstrate that the junction is predicted to exceed the theoretical capacity thresholds in the evening peak period, with a RFC predicted to be 1.024. Therefore, an intervention has been investigated, with the revised assessment results presented in the figure below.

Link	AM Peak		PM Peak		PM Peak (with Improvements)	
	RFC	Max Queue	RFC	Max Queue	RFC	Max Queue
Manor Road	0.546	1	0.359	1	0.359	1
A143 Ehringshrausen Way	0.675	2	1.024	37	0.851	5
A143 Lords Croft Lane	0.715	3	0.872	7	0.817	4

Figure 9u: Arcady results – Manor Road / A143, 2029 queue length summary with NWRR and full development of Great Wilsey Park

9.43 The results demonstrate that the RFC previously predicted as 1.024, decreases to 0.851. The intervention includes localised widening and is illustrated below.

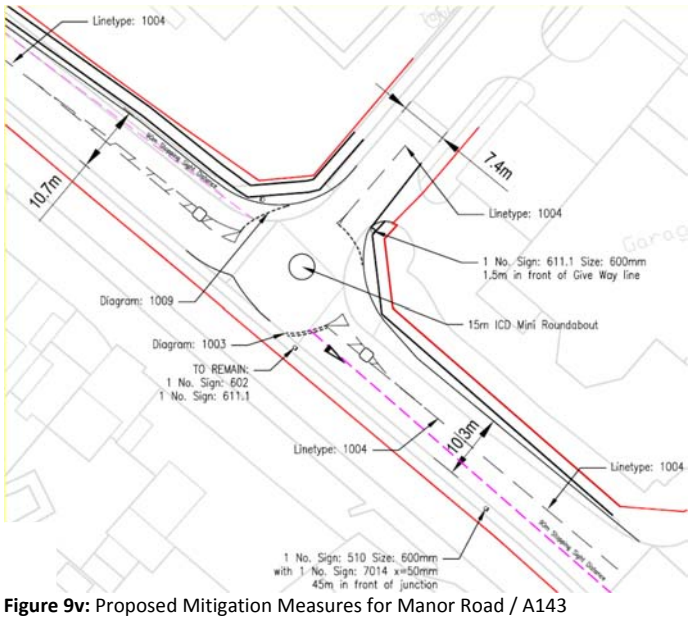


Figure 9v: Proposed Mitigation Measures for Manor Road / A143

9.44 The results indicate that the proposed intervention with improvements will operate satisfactorily for the development scenario.

9.45 The results further demonstrate that the intervention is required after the initial phase. To determine the likely trigger point for the intervention, the quantum of development on Great Wilsey Park was increased incrementally until the 0.850 capacity threshold was reached. This incremental assessment indicated that as soon as the full development on the NWGA was included, the junction would exceed the 0.850 threshold. Therefore, it is likely that the trigger point for the intervention will be circa 850 completed dwellings on the NWGA and 850 on Great Wilsey Park.

North West Relief Road Junction: A1307 Withersfield Road / Queen's Street Roundabout

9.46 The current junction is a simple roundabout with the A1307 Withersfield Road running from south to east, Queen's Street running west and Hales Barn Road to the north, as indicated below. Hales Barn Road is intended to become the new route of the new NWRR for Haverhill.

Figure 9w: A1307 Withersfield Road/Queens Street Roundabout

9.47 The results of the Arcady assessment, based on 2019 demand flows, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Hales Barn Road (NWRR)	0.118	0	0.064	0
A1307 Withersfield Road (East)	0.578	1	0.438	1
A1307 Withersfield Road (West)	0.459	1	0.711	2
Queen's Street	0.154	0	0.347	1

Figure 9x: Arcady results – A1307 Withersfield Road/Queens Street Roundabout with Phase 1 of Great Wilsey Park and NWGA

9.48 The results of the assessment demonstrate that in 2019, assuming the initial phase of both Great Wilsey Park and NWGA, this junction would operate satisfactorily, with a maximum predicted RFC of 0.711 in the evening peak.

9.49 The 2029 junction assessment results, assuming the completion of both Great Wilsey Park and NWGA, are presented below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Hales Barn Road (NWRR)	0.754	3	0.660	2
A1307 Withersfield Road (East)	0.431	1	0.261	0
A1307 Withersfield Road (West)	0.600	2	1.004	39
Queen's Street	0.205	0	0.637	2

Figure 9y: Arcady results – A1307 Withersfield Road/Queens Street Roundabout and full development of Great Wilsey Park and NWGA

9.50 The results indicate that the roundabout in its existing layout will not operate satisfactorily for the development scenario, with the peak RFC reported at 1.004 in the evening peak. Therefore, localised widening to the western approach to the roundabout from A1307 Withersfield Road is proposed. The assessment results of the 2029 scenario is presented below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Hales Barn Road (NWRR)	0.754	3	0.663	2
A1307 Withersfield Road (East)	0.431	1	0.261	0
A1307 Withersfield Road (West)	0.495	1	0.830	5
Queens Street	0.205	0	0.657	2

Figure 9z: Arcady results – A1307 Withersfield Road/Queens Street Roundabout and full development of Great Wilsey Park

9.51 The results indicate that the proposed intervention will operate satisfactorily in the future development scenario with the completion of both Great Wilsey Park and NWGA.

9.52 The results, as presented in Figure 9x, demonstrate that the intervention is required after the initial phases of both Great Wilsey Park and NWGA. To determine the likely trigger point for the intervention, the development on Great Wilsey Park was increased incrementally until the 0.850 capacity threshold was reached, assuming the complete NWGA development. This indicated that at a development quantum of circa 700 dwellings on Great Wilsey Park will trigger the need for the invervention. The intervention will take the form of widening the flare of the approach arm on the A1307 Withersfield Road (West).

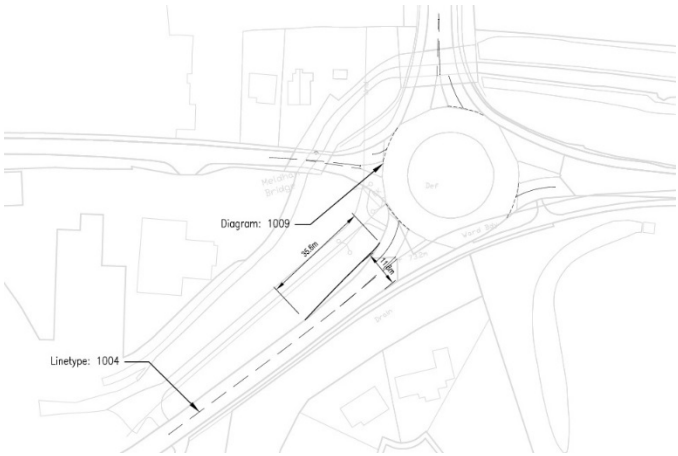


Figure 9aa: A1307 Withersfield Road/Queens Street Roundabout

NWRR Roundabout with A143 Haverhill Road

9.53 The proposed junction is a roundabout with the NWRR running to the north, A143 Haverhill Road running from the south to the east and an access road for the future NWGA to the west, as indicated below.

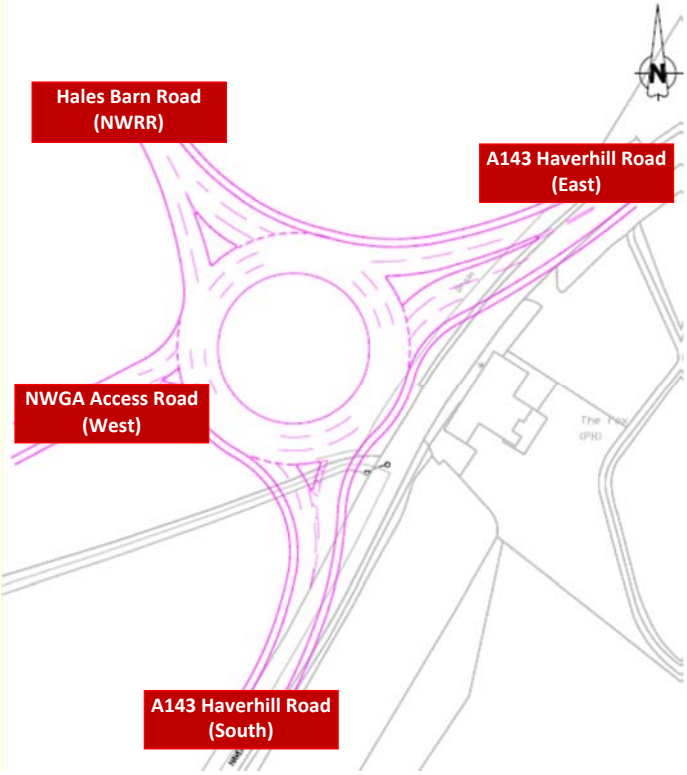


Figure 9ab: NWRR Roundabout with A143 Haverhill Road

9.54 The results of the Arcady assessment, assuming Great Wilsey Park and NWGA demand flows, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A143 Haverhill Road (East)	0.624	2	0.447	1
A143 Haverhill Road (South)	0.201	0	0.482	1
NWGA Access Road (West)	0.095	0	0.065	0
Hales Barn Road (NWRR)	0.314	1	0.461	1

Figure 9ac: Arcady results – NWRR Roundabout with A143 Haverhill Road and full development of NWGA and Great Wilsey Park

9.55 The results indicate that the proposed roundabout will operate satisfactorily for the 2029 development scenario assuming both Great Wilsey Park and NWGA developments are delivered.

A143 Northwestern Accessto Great Wilsey Park

9.56 The proposed junction is a simple roundabout with the A143 Haverhill Road running from east to west and the Development Northern Access Road to the south, as indicated below.

Figure 9ad: A143 Northern Access

9.57 The results of the Arcady assessment, based on the 2029 demand flows, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
A143 Haverhill Road (East)	0.585	1	0.594	1
Development Northern Access Road	0.644	2	0.363	1
A143 Haverhill Road (West)	0.524	1	0.823	5

Figure 9ae: Arcady results – A143 Northern Access, 2029 queue length summary with NWRR and full development of Great Wilsey Park and NWGA

9.58 The results indicate that the junction will operate satisfactorily for the development scenario.

Chalkstone Way Southern Access to *Great Wilsey Park*

9.59 The proposed junction is a simple junction with traffic signals, with Chalkstone Way running from east to west and the Development Southern Access Road to the north, as indicated below.

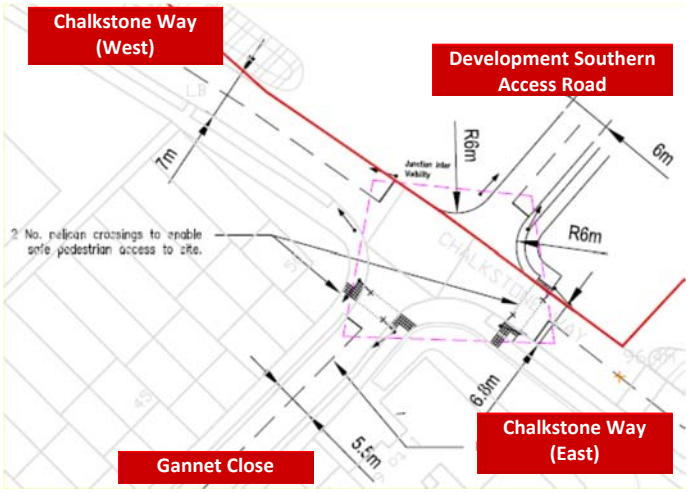


Figure 9af: Chalkstone Way Southern Access

9.60 The results of the Linsig assessment, based on 2029 demand flows, are indicated below.

Link	AM Peak		PM Peak	
	Degree of Saturation	Max Queue	Degree of Saturation	Max Queue
Chalkstone Way (West)	84.3%	12	57.2%	9
Development Northern Access Road	82.7%	11	72.1%	7
Gannet Close	9.8%	0	3.3%	0
Chalkstone Way (East)	81.8%	9	69.7%	7

Figure 9ag: Linsig results – Chalkstone Way Southern Access, 2029 queue length summary with NWRR and full development of Great Wilsey Park and NWGA

9.61 The results indicate that the junction will operate satisfactorily for the development scenario.

Coupals Road Southwesternn Access to Great Wilsey Park

9.62 The proposed junction is a simple priority junction, with Coupals Road running from east to west and the Car Park Access Road to the north, as indicated below.

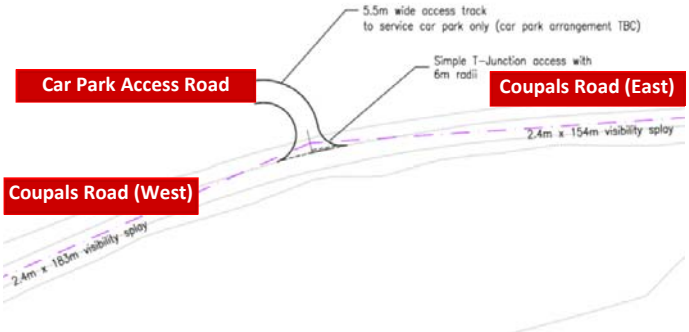


Figure 9ah: Potential access onto Coupals Road – priority junction layout

9.63 The results of the Picady assessment, based on the 2029 demand flows, are presented below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Car Park Access Road	Negligible	0	Negligible	0
Coupals Road (East)	Negligible	0	Negligible	0

Figure 9ai: Picady results – Coupals Road Access, 2029 queue length summary with NWRR and full development of Great Wilsey Park and the NWGA.

9.64 The results indicate that the junction will operate satisfactorily for the development scenario. The results reflect the low levels of traffic expected to be generated in the peak periods.

Summary of Interventions

9.65 From the traffic modelling presented in this chapter, BCL recommend the following interventions for the long-term sustainability of traffic flow throughout Haverhill in line with the proposed development.

Site Access Points

- **Great Wilsey Park northwestern access:** Formed via a three-arm roundabout with A143 Haverhill Road
- **Great Wilsey Park southern access:** Formed via a signalled controlled access point with Chalkstone Way
- **Great Wilsey Park southeastern access:** Formed via a priority junction with Coupals Road, to a car park for the recreational space within the development

Off Site interventions

- **A143 / Manor Road Junction**: Small localised widening to the A143 approach roads at the mini-roundabout with Manor Road
- **A1017 / A1307 Roundabout:** Improvements to the roundabout between the A1017 and A1307 with the addition of a dedicated left-turn lane from A1307 Cambridge Road (West) into A1307 Cambridge Road (East)
- **A1307 Withersfield Road / Queens Street Roundabout:** Localised widening to the western approach to the roundabout from A1307 Withersfield Road.

9.66 The above chapter reviewed the wider road network, identifying mitigation where necessary. The next chapter presents the assessment of the highway environs of the Cangle junction.

10 Local Road Network Review – Cangle Junction Assessment

Introduction

10.1 Through the scoping discussions, it has been agreed to create a VISSIM Micro-simulation traffic model to assess the impacts on the Cangle junction. The scope of the model has been discussed with SCC prior to commencement, with the micro-simulation scoping report contained in the appendix.

10.2 VISSIM 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 Time Assessment -** providing results for the time taken to negotiate the junction
- **Junction Queuing** – identifies the level of queuing at junctions

10.3 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.

10.4 As agreed through the discussions with SCC, the VISSIM model study area contained extended sections of Withersfield Road and Wratting Road, as indicated below.

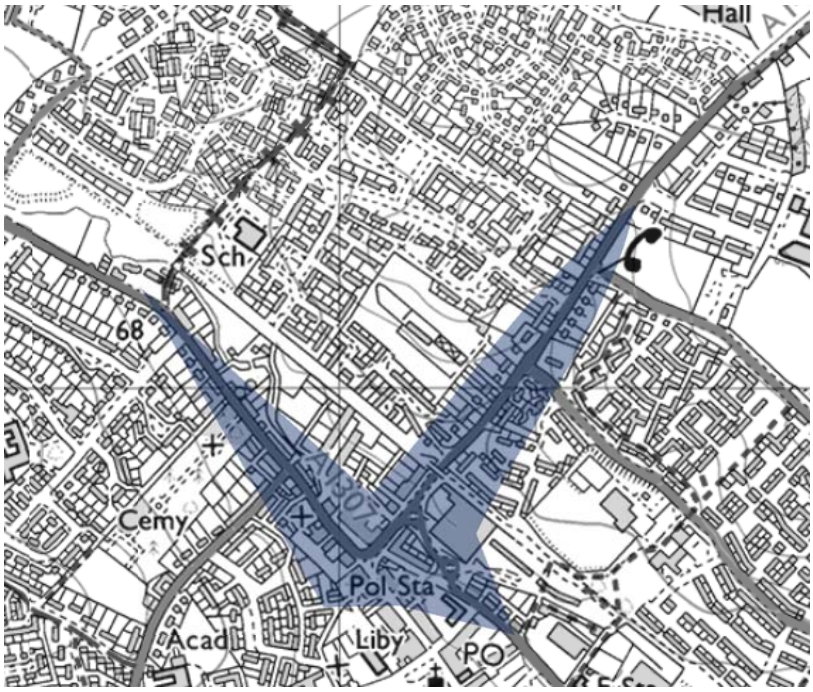


Figure 10a: Micro-simulation study area

Assessment Scenarios / Mitigation Strategy

10.5 The VISSIM model assessed the following traffic scenarios:

2019

Do-Minimum1 – Represents the 2019 future year with NWGA Phase 1, this represents the future base line

Do-Minimum2 – Represents the 2019 future year with NWGA & Great Wilsey Park Phase 1

Do-something1 - Represents the 2019 future year with NWGA & Great Wilsey Park Phase 1 together with mitigation

2029

Do-Minimum3 – Represents the 2029 future year with full NWGA & NWRR together with Great Wilsey Park Phase 1

Do-Minimum4 – Represents the 2029 future year with full NWGA & NWRR together with Great Wilsey Park Phase 1

Do-something2 - Represents the 2029 future year with NWGA & Great Wilsey Park together with mitigation

Through the assessment process, it became evident that mitigation within the study area would be required in advance of the delivery of the NWRR. Several options for mitigation has been considered, including the signalisation of the Cangle junction. Through the modelling process, an intervention to signalise the A143 junction with Lord's Croft Lane is identified to respond to the development traffic. The identified intervention is indicated below and contained in Appendix D.

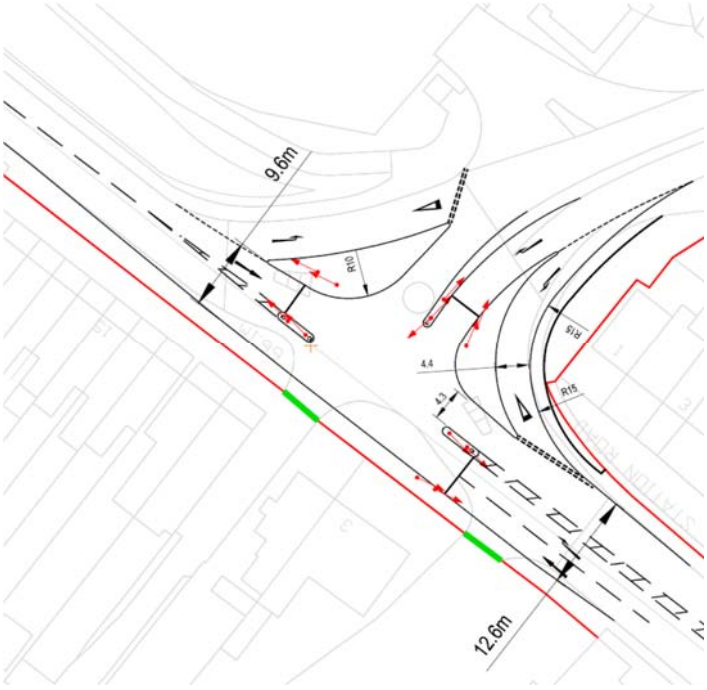


Figure 10b: A143 / Lord's Croft Lane: Implementation of traffic signals in place of existing roundabout

10.6 The results of the modelling are discussed in further detail below.

Road Network Review – Network Review

10.7 A number of statistics used in the analysis have been obtained from analysing each individual trip that has occurred within the network. 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.

10.8 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

10.9 The result for the mean delay over the 2019 modelling period is presented below.

Time period	Do-mimimum 1	Do-mimimum 2	Do-something1
Morning Peak	25	33	26
Evening Peak	22	28	40

Figure 10c: Network Mean Delay (s) – 2019

10.10 The results indicate that the mean delay increases from the Do-minimum 1 base line once the development is included. This is not unexpected as the delivery of the Great Wilsey Park, without the benefit of highway interventions, will invariably increase delays at critical junctions.

10.11 The result for the mean delay over the 2029 modelling period is presented below.

Time period	Do-mimimum 3	Do-mimimum 4	Do-something2
Morning Peak	38	52	26
Evening Peak	32	59	43

Figure 10d: Network Mean Delay (s) – 2029

10.12 The do-minimum 3 and 4 represent the 2029 future year with the inclusion of NWGA and Great Wilsey Park respectively. The results presented above indicate that delay decreases through the inclusion of the intervention, as identified via the decrease from 38 seconds to 26 seconds. It is noted that in the morning peak, there is an overall beneficial improvement.

10.13 The introduction of the intervention provides an improvement in the predicted delay in the evening peak, as identified by the reduction from 59 seconds to 43 seconds. The delay is a function of background growth together with delivery of the identified housing. Delay does not by itself equate to the ability of the road network to operate at satisfactory levels. The operation of the road network is best assessed against journey times and queuing, which is discussed in subsequent sections.

Average Speeds

10.14 The result for the average speeds over the 2019 modelling period is presented below.

Time period	Do-mimimum 1	Do-mimimum 2	Do-something1
Morning Peak	29	26	28
Evening Peak	29	27	23

Figure 10e: Average Speeds – 2019

10.15 The 2019 analysis of the average speeds identifies that average speeds decrease slightly through the introduction of the residential element. However, there is no discernible difference in average speed when the intervention is included, demonstrating that the identified intervention mitigates the impact of the development.

10.16 The 2029 results are presented below.

Time period	Do-mimimum 3	Do-mimimum 4	Do-something2
Morning Peak	24	20	29
Evening Peak	26	18	22

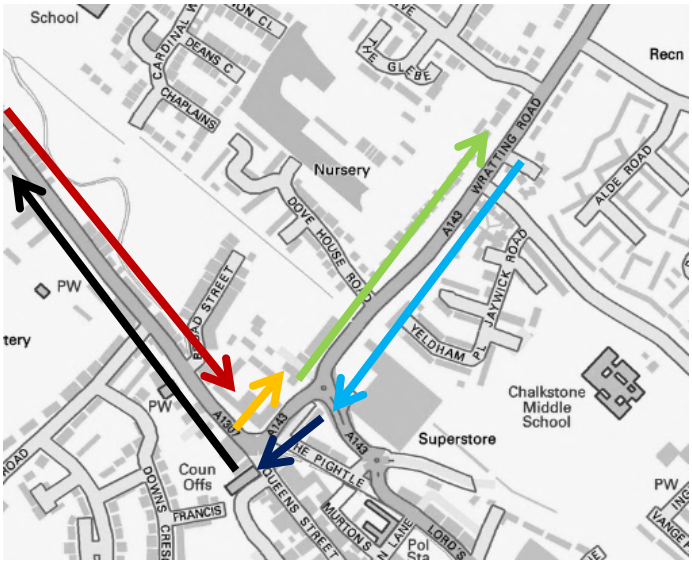
Figure 10f: Average Speeds - 2029

10.17 The results presented above indicate that average speeds increase through the inclusion of the intervention. It is noted that in the morning peak, there is an overall beneficial improvement.

10.18 The introduction of the intervention provides an improvement in the predicted average speeds in the evening peak period. The operation of the road network is best assessed against journey times and queuing, which is discussed in subsequent sections.

Road Network Review – Journey Times

10.19 Outputs from the VISSIM model include 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:



Route 1.1 – Eastern Avenue to Queen's St

Route 1.2 – Queen's St to Lord's Croft Ln

Route 1.3 - Lord's Croft Ln to Chapple Dr

Route 2.1 - Chapple Dr to Lord's Croft Ln

Route 2.2 - Lord's Croft Ln to Queen's St

Route 2.3 - Queen's St to Eastern Avenue

Figure 10g: Journey Time route

10.20 The 2019 journey time results are presented below.

	Route	Morning Peak			Evening Peak		
		Do-mimimum 1	Do-mimimum 2	Do-something1	Do-mimimum 1	Do-mimimum 2	Do-something1
1.1	Eastern Avenue to Queens St	00:00:45	00:00:46	00:00:47	00:00:51	00:01:00	00:00:56
1.2	Queens St to Lords Croft Ln	00:00:13	00:00:13	00:00:14	00:00:16	00:00:18	00:00:16
1.3	Lords Croft Ln to Chapple Dr	00:00:52	00:00:54	00:00:53	00:00:56	00:01:01	00:00:58
2.1	Chapple Dr to Lords Croft Ln	00:01:04	00:01:15	00:00:47	00:00:50	00:00:53	00:00:49
2.2	Lords Croft Ln to Queens St	00:00:16	00:00:16	00:00:13	00:00:16	00:00:16	00:00:13
2.3	Queens St to Eastern Avenue	00:00:46	00:00:47	00:00:47	00:00:47	00:00:48	00:00:48

Figure 10h: 2019 Journey Time Results

10.21 This demonstrates that through the introduction of the residential element the majority of the routes do not experience any significant change in journey times in the morning or evening peak periods. This demonstrates that the development will not have an impact in 2019.

10.22 The 2029 results are presented below.

	Route	Morning Peak			Evening Peak		
		Do-mimimum 2	Do-mimimum 3	Do-something1	Do-mimimum 3	Do-mimimum 4	Do-something1
1.1	Eastern Avenue to Queens St	00:00:46	00:00:47	00:00:43	00:00:56	00:01:55	00:01:16
1.2	Queens St to Lords Croft Ln	00:00:13	00:00:14	00:00:14	00:00:18	00:00:24	00:00:14
1.3	Lords Croft Ln to Chapple Dr	00:00:56	00:01:16	00:00:51	00:01:01	00:01:14	00:00:55
2.1	Chapple Dr to Lords Croft Ln	00:01:28	00:01:44	00:00:49	00:00:59	00:01:10	00:00:59
2.2	Lords Croft Ln to Queens St	00:00:15	00:00:16	00:00:12	00:00:16	00:00:16	00:00:12
2.3	Queens St to Eastern Avenue	00:00:46	00:00:45	00:00:45	00:00:47	00:00:46	00:00:45

Figure 10i: 2029 Journey Time Results

10.23 This demonstrates that through the introduction of the residential element the majority of the routes do not experience any significant change in journey times in the morning or evening peak periods. Route 1.1 and 2.1 indicate that the intervention will improve the journey times in these sections. Fundamentally, the results demonstrate that the development will have a negligible impact in 2029.

Road Network Review – Journey Queue Analysis

10.24 The VISSIM model has been employed to predict the extent of queuing at the junctions across the modelled area. Those locations that have been assessed are indicated below. Queue length analysis is intended to provide a more detailed picture of the impacts at specific junctions within the model network. The results presented refer to queue length in metres and not number of vehicles.

10.25 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.

10.26 The location for the junction queue assessments are provided below.

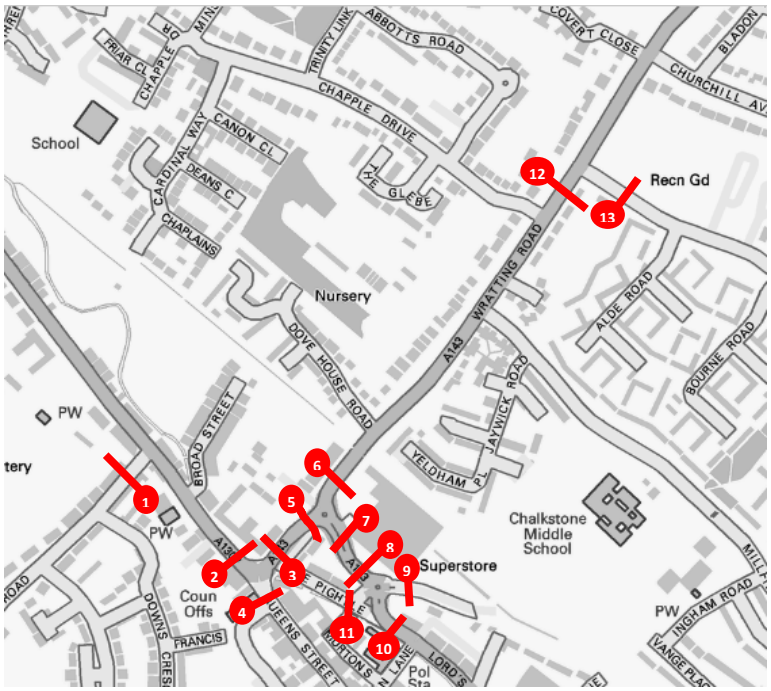


Figure 10j: Queue length locations

- Location 1 – Northbound Crowland Road approach to Withersfield Road
- Location 2 - Eastbound Withersfield Road approach to Cangle junction
- Location 3 – Southbound Wrattling Road approach to Cangle junction
- Location 4 – Westbound Queen's Street approach to Cangle junction
- Location 5 – Northbound Wrattling Road approach to Lord's Croft Lane
- Location 6 - Southbound Wrattling Road approach to Lord's Croft Lane
- Location 7 – Westbound Lord's Croft Lane approach to Wrattling Road
- Location 8 – Eastbound Lord's Croft Lane approach to Tesco Roundabout
- Location 9 - Tesco exit arm
- Location 10 – Westbound Lord's Croft Lane approach to Tesco Roundabout
- Location 11 – Northbound approach to Tesco Roundabout
- Location 12 – Northbound Wrattling Road approach to Chalkstone Way
- Location 13 – Westbound Chalkstone Way to Wrattling Road

10.27 The 2019 queue lengths are presented below.

	Route	Do-mimimum 1		Do-mimimum 2		Do-something1	
		AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1	Northbound Crowland Road approach to Withersfield Road	2	2	2	2	2	2
2	Eastbound Withersfield Road approach to Cangle junction	4	14	5	42	5	30
3	Southbound Wrattling Road approach to Cangle junction	1	1	1	2	2	2
4	Westbound Queen's Street approach to Cangle junction	1	6	2	9	2	8
5	Northbound Wrattling Road approach to Lord's Croft Lane	2	9	3	19	7	14
6	Southbound Wrattling Road approach to Lord's Croft Lane	85	16	160	25	5	4
7	Westbound Lord's Croft Lane approach to Wrattling Road	2	8	3	13	7	70
8	Eastbound Lord's Croft Lane approach to Tesco Roundabout	3	4	3	4	6	5
9	Tesco exit arm	1	3	1	3	1	3
10	Westbound Lord's Croft Lane approach to Tesco Roundabout	1	18	2	28	2	176
11	Northbound approach to Tesco Roundabout	0	0	0	0	0	0
12	Northbound Wrattling Road approach to Chalkstone Way	6	7	13	27	12	22
13	Westbound Chalkstone Way to Wrattling Road	30	2	65	8	63	7

Figure 10k: 2019 Queue length results (metres)

10.28 A review of the queue length indicates that the introduction of the development, together with the intervention, will have a negligible effect. The introduction of the intervention will have a moderate beneficial impact on the Southbound Wrattling Road approach to Lord's Croft Lane.

10.29 The 2029 results are presented below.

	Route	Do-mimimum 3		Do-mimimum 4		Do-something2	
		AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)	AM (8-9)	PM (5-6)
1	Northbound Crowland Road approach to Withersfield Road	2	2	2	3	2	2
2	Eastbound Withersfield Road approach to Cangle junction	4	30	6	256	2	9
3	Southbound Wrattling Road approach to Cangle junction	1	1	1	1	1	1
4	Westbound Queen's Street approach to Cangle junction	1	7	1	10	1	4
5	Northbound Wrattling Road approach to Lord's Croft Lane	3	18	5	48	5	26
6	Southbound Wrattling Road approach to Lord's Croft Lane	234	42	340	79	10	6
7	Westbound Lord's Croft Lane approach to Wrattling Road	3	17	3	26	8	18
8	Eastbound Lord's Croft Lane approach to Tesco Roundabout	4	5	4	5	14	13
9	Tesco exit arm	1	4	1	5	2	5
10	Westbound Lord's Croft Lane approach to Tesco Roundabout	2	87	3	177	4	177
11	Northbound approach to Tesco Roundabout	0	0	0	0	0	0
12	Northbound Wrattling Road approach to Chalkstone Way	16	35	152	156	6	7
13	Westbound Chalkstone Way to Wrattling Road	67	9	99	106	62	9

Figure 10l: 2029 Queue length results (metres)

10.30 The results presented above demonstrate that there will be a negligible impact on the majority of the approach arms, with a substantial improvement on the Southbound Wratting Road approach to Lord's Croft Lane. There are several links reporting an increase in queuing. The delivery of the NWRR would provide an equitable route choice such that a proportion of the trips would divert to avoid the potential delay. The results for the Do-Something 2 indicates the queuing once the intervention and trip diversion is to occur.

10.31 The link with the highest increase in queuing is Location 10 - Westbound Lord's Croft Lane approach to Tesco

10.32 **Location 10 - Westbound Lord's Croft Lane approach to Tesco –** the results of the queuing assessment indicates that there is a queue of 177m in the evening peak, an increase of 90m, equivalent to 15 vehicles. This is not unexpected as this junction will experience an increase in development trips to / from the east. It is noted the Location 7, the next junction, does not report similar levels of queuing. Therefore, this would suggest that the issue is more related to the supermarket traffic. Sporadic evening peak flows into supermarkets are common, for example similar queuing is not reported in the morning peak. Furthermore, it is noted that the queuing is only reported in 2029 and not in 2019.

10.33 A review of the development traffic figures indicates that there are 124 trips travelling westbound on Lord's Croft Lane, the destination being Great Wilsey Park. The agreed methodology adopts a static transport model. In reality, there are

alternative routes to access the development to disperse the development impact. Therefore, it is considered that the development will not have a significant impact at this junction.

Cangle Junction Assessment Summary

10.34 The operation of the Cangle Junction has been assessed through a VISSIM micro-simulation traffic model. This has assessed the journey time and queue lengths through the model.

10.35 The assessment indicates that there is a negligible impact on journey times following the introduction of the signalisation of the A143 / Lord's Croft Lane junction. Therefore, the development will not have a material impact on the operation of the road network.

Junction Assessment Summary

10.36 The TA has assessed the impact of Great Wilsey Park, identifying that the residual impact is not severe following the introduction of the identified highway interventions, as listed below:

Site Access Points

- **Great Wilsey Park northwestern access:** Formed via a three-arm roundabout with A143 Haverhill Road
- **Great Wilsey Park southern access:** Formed via a signalled controlled access point with Chalkstone Way
- **Great Wilsey Park southeastern access:** Formed via a priority junction with Coupals Road, that will only serve a car park for the recreational space within the development

Off Site interventions

- **A143 / Lord's Croft Lane:** Implementation of traffic signals in place of existing roundabout
- **A143 / Manor Road Junction**: Small localised widening to the A143 approach roads at the mini-roundabout with Manor Road
- **A1017 / A1307 Roundabout:** Improvements to the roundabout between the A1017 and A1307 with the addition of a dedicated left-turn lane from A1307 Cambridge Road (West) into A1307 Cambridge Road (East)
- **A1307 Withersfield Road / Queens Street Roundabout:** Localised widening to the western approach to the roundabout from A1307 Withersfield Road.

10.37 Therefore, following the identification of a comprehensive intervention package, it is concluded that the development should be supported from a highways and transportation standpoint.

11 Limitations

11.1 The conclusions and recommendations highlighted above are limited to the general availability of background information and the planned usage of the site.

11.2 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.

11.3 The benefits of this report are provided to HLM and Mrs. Pelly for the proposed development land at the north-east of Haverhill.

11.4 Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A – Scoping Note

Land at Haverhill

Transport Assessment Scoping Note

Brookbanks

Document Control Sheet

Document Title: Transport Assessment Scoping Note

Document Ref: 10173/SR/01

Project Name: Land at Haverhill

Project Number: 10173

Client: Hallam Land Management Ltd and Commercial Estates Group

Document Status

Rev	Issue Status	Prepared / Date	Checked / Date	Approved / Date
0	Draft	A Eggleston 27/08/14	P Boileau 27/08/14	P Boileau 27/08/14
1	Final	A Eggleston 07/11/14	P Boileau 07/11/14	P Boileau 07/11/14
2	Final	M Moss 12/12/14	A Eggleston 12/12/14	P Boileau 12/12/14
3	Final	M Moss 24/09/15	A Eggleston 24/09/15	L Witts 24/09/15

Issue Record

Name / Date & Revision	27/08/14	07/11/14	12/12/14	24/09/15		
P Glazebrook (Hallam Land Management Ltd)	-	1	2	3		
D Lewis (CEG)	-	1	2	3		

Contents

Appendix

1 Introduction and Background

1.1 This Transportation Scoping Note has been prepared by Brookbanks Consultants Ltd on behalf of Hallam Land Management Ltd and Commercial Estates Group for a proposed residential development on Land to the north east of Haverhill, Suffolk.

1.2 The development will be referred to as the North East Growth Area (NEGA) in the remainder of this report.

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 the development.

1.4 The assessment will be carried out in accordance with guidance given in the Department for Transport (DfT)'s "Transport Assessment Guidelines", issued in March 2007.

1.5 HLM and CEG consider the development of this site to represent an appropriate and available location for development.

2 Policy Review and Existing Conditions

Policy Review

2.1 Local and regional policies regarding the development of new sites within the Haverhill hinterland 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. This will include a review of the following documents:

- The Government White Paper on Transport, 2004
- National Planning Policy Framework
- Local Development Framework
- Relevant Local Plan saved policies
- SCC Local Transport Plan

Haverhill Background

2.2 Haverhill is located some 30km to the southeast of Cambridge and lies within the county of Suffolk. The Local Planning Authority is St Edmundsbury Borough Council.

2.3 The adopted Core Strategy (2010) identifies the growth proposals agenda within the Borough until 2031. Within Haverhill, two broad locations for growth are identified, being to the northwest and northeast of the town centre which are planned for 1,150 and 2,500 dwellings respectively.

2.4 The road network of Haverhill is dominated by the A1017 that forms the developed southern boundary of the town and provides a transport link to Cambridge. The A1307 and the A143 provides an alternative route for east to west vehicle movements through the town and the A143 continues northbound from the town centre, linking Haverhill to Bury St Edmunds via a number of villages. The local road network is indicated below.

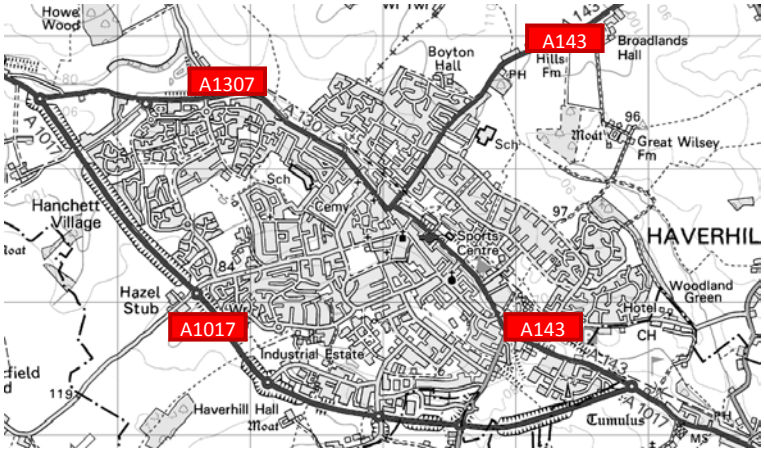


Figure 2a: Haverhill Local Road Network

2.5 The Northwest Growth Area was identified in the now superseded Local Plan, with the housing trajectory identifying 750 homes before 2016. To deliver this quantum of development, the CS identifies the requirement for development to deliver the Haverhill North West Relief Road (NWRR), which links between the A1307 and the A143.

2.6 At the time of writing, it is understood that design and implementation of the NWRR is a matter currently being discussed between the applicants and the planning authority.

Existing Conditions

2.7 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. Any existing barriers or constraints to movement will be identified, investigated and described.

2.8 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.

2.9 The level of service and spare capacity offered by existing bus services passing adjacent to the site and connecting to trip generators such as local shops and the town centre will be investigated, described and assessed in the TA.

Highway Safety

2.10 It is proposed that a review of historical accidents is to be carried out within the study area identified below 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.

2.11 The roads included within the study area are indicated below.

Figure 2b: Accident Study Area

3 Development Proposals

Development Quantum

3.1 The proposal involves the delivery of a primarily residential development supported by complimentary land uses. At the time of writing, it is expected that the development will deliver 2,500 houses supported by a local centre and 2 form entry primary schools.

3.2 At the time of writing it is envisaged that the development will be constructed in various phases over the Local Plan period, with the first phase anticipated to open in 2017.

Site Access

3.3 At the time of writing, the development will be accessed via two separate points:

- The first access will be a roundabout on A143 Haverhill Road accessing the northern flank of the development.
- The second access shall be from Chalkstone Way near an existing t-junction. Presently three options are being considered for this in the form of a crossroad junction, a roundabout and a traffic signalled junction. These will be discussed in further detail in the forthcoming transport assessment and a final design will be agreed.

3.4 The proposed accesses will be designed to the appropriate design standards.

3.5 It is considered that the two points of access will allow the site to be adequately be serviced via both emergency and refuse vehicles at all times. The road layout within the development site is adequate and incorporates all the required turning facilities for all vehicles to safely manoeuvre through the site.

Parking Provision

3.6 Parking provision is provided in accordance with the latest SCC car parking standards, taking into account Paragraph 39 of the NPPF which 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 Car parking provision will be provided in line with St. Edmundsbury Borough Council's standards for residential development and with commercial uses will have parking provided in line with guidance from NPPF standard PPG13, as the most appropriate source in the absence of adopted guidance. Parking will be provided in line with current best practice in a number of forms, in courts, on curtilage and on-street.

3.8 The application is submitted in outline and parking numbers can be refined / defined at reserved matters stage. The parking strategy will however, reflect the primary focus of the transport strategy which primarily seeks to target mode shift away from private car use. A flexible approach to parking design and provision will be adopted, through a provision of on-street, on-plot, courts and individual garages. At the time of writing it is envisaged that the parking provision will be delivered through a mix of allocated and unallocated parking with the St. Edmundsbury Borough Council guidance on parking provision treated as maximum standards.

Sustainable Access

3.9 The site will be designed to be readily permeable to both pedestrians / cyclists and public transport. Local bus services will be described in detail within the Transport Assessment.

3.10 The delivery of a sustainable development is fundamentally based on appropriate movement strategies for walking, cycling and public transport. These will be covered within the TA.

3.11 The location of the site will be reviewed in line with 2km and 5km maximum isochrones for trips to be made by walking and cycling.

4 Traffic Modelling Methodology

Introduction

4.1 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.

4.2 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 vehicle over a set time period. The model is a simplified representation of real time traffic conditions. To ensure these reflect traffic conditions accurately, the output 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 operation the future. These models are computer simulations using software like Paramics 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 included with development traffic flows which are generated by using trip rates from Trics, distributed by Census travel statistics.

4.3 The NWGA used the traditional method as there is no formal traffic model covering Haverhill, with this approach being acceptable to SCC. Therefore, a similar traditional approach to assess the NEGA will be used, as described below.

Base Line Traffic Scenario

4.4 Existing Traffic Flows on the network in the vicinity of the proposed development are usually obtained and used as the basis of any traffic assessment.

4.5 Newly commissioned classified turning counts were carried out at the locations indicated below and highlighted in the Figure below. These locations for traffic flows are considered as the immediate junctions within the surrounding road network that the development is likely to impact, in terms of traffic. Through the emerging masterplan, site access strategy and development phasing there is the potential that additional junctions may be required to be assessed.

- Location 1 – A1017 / A1307
- Location 2 – Cangle Junction
- Location 3 – Haverhill Road (A143) / Chalkstone Way
- Location 4 – Chalkstone Way / Sturmer Road (A143)
- Location 5 – A143 / A1017
- Location 6 – Water Lane (B1061) / A1017
- Location 7 - Water Lane (B1061) / Coupals Road
- Location 8 - Chalkstone Way / Coupals Road
- Location 9 - Manor Road / A143
- Location 10 – Howe Road / A1307
- NWRR junctions (yet to be constructed)

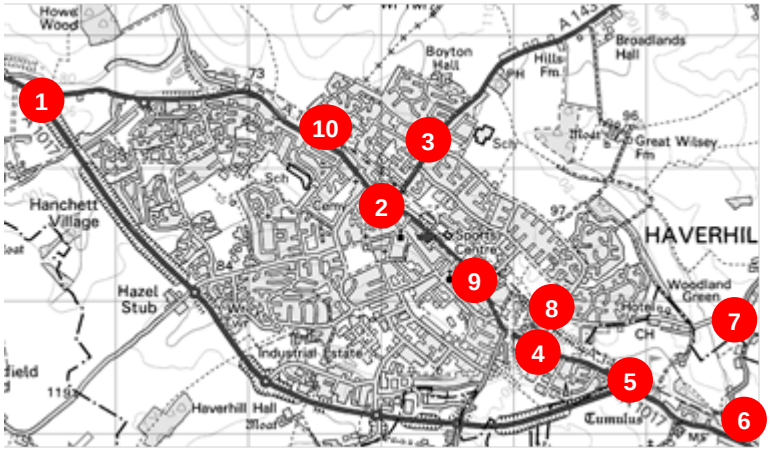


Figure 4a: Traffic survey locations

Future Traffic Assessment & Growth Scenarios

4.6 To assess the propensity for background growth, Tempro growth forecasts were investigated, this indicated the following growth:

- 2014 Households = 10,720
- 2019 Households = 11,490 reflecting an increase of 770 dwellings
- 2024 Households =12,277 reflecting an increase of 1,557 dwellings
- 2029 households = 13,048 reflecting an increase of 2,328 dwellings

4.7 This demonstrates that the combination of both the NEGA and the NWGA will deliver housing over and above that identified within Tempro, therefore any inclusion of background will result in double counting. On this basis, the assessment will not include any assumptions for background growth.

4.8 Traffic growth is also a factor of the creation of jobs. Therefore looked in Tempro at the resulting background traffic growth levels with all of the housing growth assumptions removed. The result is indicated below.

	Urban	Rural	All	Urban	Rural	All
	2014-2019			2014-2019		
Motorway	-	1.071	1.067	-	1.034	1.031
Trunk	1.071	1.078		1.034	1.041	
Principal	1.060	1.063		1.024	1.027	
Minor	1.060	1.063		1.024	1.027	
All	1.063	1.071		1.027	1.034	
	2014-2024			2014-2024		
Motorway	-	1.160	1.150	-	1.084	1.075
Trunk	1.155	1.176		1.080	1.099	
Principal	1.134	1.142		1.060	1.067	
Minor	1.133	1.141		1.059	1.067	
All	1.141	1.159		1.067	1.084	
	2014-2029			2014-2029		
Motorway	-	1.238	1.219	-	1.123	1.106
Trunk	1.226	1.251		1.112	1.135	
Principal	1.197	1.206		1.086	1.094	
Minor	1.203	1.212		1.092	1.100	
All	1.209	1.230		1.097	1.115	

Figure 4b: AM Peak Background Traffic growth from Tempro

	With All Housing Growth			With No Housing Growth		
	Urban	Rural	All	Urban	Rural	All
	2014-2019			2014-2019		
Motorway	-	1.074	1.070	-	0.969	0.966
Trunk	1.074	1.081		0.970	0.976	
Principal	1.063	1.067		0.959	0.963	
Minor	1.063	1.067		0.960	0.963	
All	1.067	1.074		0.963	0.969	
	2014-2024			2014-2024		
Motorway	-	1.168	1.158	-	1.053	1.044
Trunk	1.164	1.184		1.049	1.067	
Principal	1.142	1.150		1.029	1.037	
Minor	1.141	1.149		1.029	1.036	
All	1.149	1.167		1.036	1.052	
	2014-2029			2014-2029		
Motorway	-	1.253	1.233	-	1.128	1.111
Trunk	1.241	1.266		1.117	1.140	
Principal	1.212	1.221		1.091	1.099	
Minor	1.218	1.227		1.096	1.105	
All	1.223	1.244		1.101	1.120	

Figure 4c: PM Peak Background Traffic growth from Tempro

4.9 Therefore based on the above, the following growth rates based on the Urban Principal road type are to be adopted.

- 2014 to 2019 AM peak – 1.024
- 2014 to 2019 PM peak – 0.959
- 2014 to 2024 AM peak – 1.060
- 2014 to 2024 PM peak – 1.029
- 2014 to 2029 AM peak – 1.086
- 2014 to 2029 PM peak – 1.091

Committed Development

4.10 Investigation undertaken indicates that the NWGAm and the NWRR need to be included in the assessments, in addition to the Tempro growth identified above. BCL are currently liaising with Census Customer Services concerning how to obtain up-to-date Census O-S Data. Provided that the data can be obtained within the required timescales, this data shall be used within the forthcoming transport assessment, else the available data for 2001 shall be used as it is in all assessments so far.

4.11 At the time of writing, the Northwest Growth Area planning application has yet to be determined. It is understood that design and implementation of the NWRR is a matter currently being discussed between the applicants and the planning authority.

Trip Generation

4.12 To predict the likely levels of trips generated by the proposed development, TRICS was used to estimate the likely trip rates. The TRICS database is updated on an bi-annual basis and as such the updated 2014 version has been used for the updated assessment. At the time of writing, a development of this size is likely to deliver a reasonable element of social housing, which needs to be reflected in the assessment due to the corresponding reduced car based trips.

4.13 Through discussions with WSP, it has been agreed that their TRICS values shall be adopted with respect to private dwellings as this will represent a worst case scenario. This resulted in the following trip rates:

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	**Two-way**	Arrivals	Departures	**Two-way**
Trip Rates per dwelling-private	0.179	0.443	0.622	0.426	0.262	0.688
Trip Rates per dwelling-social	0.131	0.252	0.383	0.275	0.188	0.463
Primary Schools	0.351	0.237	0.588	0.006	0.027	0.033

Figure 4d: Development Trip Rates; TRICS 2014

4.14 The development will deliver houses for the open market together with affordable / social housing. The current Planning Policy indicates that 30% of affordable housing should be provided. In determining the Trip Rates for the residential element, these were based on a robust 80% private and 20% rented. Hence the final trip rates will have 20% of the final development as affordable or social housing. This will result in the following blended residential trip rates.

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	**Two-way**	Arrivals	Departures	Two-way
Resultant Residential trip rate	0.169	0.405	**0.574**	0.396	0.247	**0.643**

Figure 4e: Resultant housing trip rates

4.15 The development may deliver complimentary land uses, including local centre facilities. These will serve the demands of the development and as such will not generate any explicit external trips. Therefore the only external trips will be those generated by the residential element of the development.

4.16 Based on the above trip rates, the figure below identifies the total number of vehicle trips generated by the development, based on 240 primary school places provided. This assumes that there will be two form entries, with each form taking 30 children over a seven year period (i.e. 30 * 7 * 2 = 420).

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 2,500 units	424	1012	1436	990	618	1608
Primary Schools	147	100	247	3	11	14

Figure 4f: Vehicle trips

Internalisation

4.17 The development is likely to deliver a complementary mix of land uses that will reduce the number of trips exiting the development. The development will deliver a total of 420 primary school places. It is likely that a number of these places will be filled by children from this development, and therefore will not generate an external trip.

4.18 To determine the likely demand on school places Census statistics have been reviewed.

4.19 This indicates that in 2011 there were 3,079 houses in the Haverhill East Ward, resulting in 604 primary school age children, equivalent to 0.197 child per house.

4.20 Therefore it is considered that 492 primary school age children will be generated by the development.

4.21 These calculated trips are directly linked to the available school places and would be internal or part of the housing trip generation. The remainder of the school places will therefore be treated as additional external trips, as indicated below – applying the Primary School trip rates found above.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
School external trips – 72 place	25	17	42	0	2	2

Figure 4g: External Vehicle School trips

4.22 The figure below quantifies the external trips.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 2,500 units	424	1012	1436	990	618	1608
School external trips – 72 place	25	17	42	0	2	2

Figure 4h: Vehicle trips

Trip Distribution and Assignment

4.23 The generated traffic will be assigned to the road network utilising the same distribution as per the NWGA transport assessment, as indicated below, with this methodology reviewed against 2011 Census travel to work data to ensure relevance. Should there be a distinct difference, the 2011 Census travel to work data will take precedent.

Distribution	Percentage
North via Haverhill Road	8%
East via A143	39%
West via A1307	53%
TOTAL	100%

Figure 4h: Trip distribution

Junction Assessments

4.24 Priority controlled T-junctions and roundabouts will be assessed using the computer software packages PICADY and ARCADY, respectively, with signal controlled junctions assessed by the LINSIG software package.

4.25 Through initial discussions with SCC it has been indicated that the key junction of traffic constraint is the Cangle Junction. Therefore to assess the potential impact of this junction it has been agreed to establish a Paramics junction traffic model to assess this junction, to support any ARCADY assessments carried out.

4.26 The Paramics model will need to include the following:

- Cangle junction
- A143 / Lady Croft Lane
- Tesco roundabout
- Pedestrian crossing points

Trip Diversion

4.27 The delivery of the NWRR will provide an alternative route for trips between the A1307 to the west and the A143 to the north. The application for the NWGA assumed that 50% of the trips would divert from the Cangle junction. This same percentage will be assumed. This will be reviewed against the completion of the trip assignment work. Should this become critical, sensitivity testing may be carried out.

Assessment Scenarios

4.28 At the time of writing, it is expected that the traffic counts will be completed in 2014, thus forming the base year scenario. As indicated above, no additional assumption on growth other than the growth areas will be included.

4.29 The NWRR will be delivered as part of the NWGA access strategy. At the time of writing it is understood that the NWRR will be delivered no less than five years after commencement of the NWGA. It is likely that initial parcels of development will occur on both the NEGA and the NWGA prior to the completion of the NWRR. Therefore the following traffic scenarios will be tested. During the assessment process the development quantum could change depending on the junction assessment results.

Scenario	NWGA	NEGA
Test 1 – Existing operation	0	0
Test 2 – Initial Phases – no NWRR	300	300
Test 3 – Initial Phases – no NWRR	300	500
Test 4 – Initial Phase – no NWGA	0	1,200
Test 5 – Full Phases – With NWRR	1,150	2,500

Figure 4i: Development Phasing

4.30 These scenario tests may be amended once the assessment process has commenced.

5 Mitigation

5.1 From the above junction assessments the need for any remedial measures to achieve a satisfactory 'no net detriment' situation will be identified. Any junctions where improvements are necessary will be reassessed to demonstrate the adequacy of those proposals in terms of junction performance. Either these improvements will be proposed in association with the development or an appropriate contribution to a more major scheme will be offered where there are already plans to implement an alternative improvement.

5.2 Any improvements identified will be assessed against the scale of impact. NPPF indicates a framework to judge the nature of mitigation, as indicated below.

All developments that generate 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; and*
- *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.*

5.3 A sustainable strategy will be developed to maximise connectivity of the site by walking, cycling and public transport. The TA will detail any interventions required.

6 Summary

6.1 The transportation impact of the proposed development will be assessed in line with guidance given in DfT's "Transport Assessment Guidelines" of 2007.

6.2 The likely transport impact of the proposed development will be assessed using a manual method of traffic generation and assignment. Junction capacities will be assessed and remedial measures proposed wherever impact is considered unacceptable.

Appendix A – Trip Rates

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
VEHICLES

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Number of dwellings
Actual Range:	108 to 437 (units:)
Range Selected by User:	100 to 2000 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/02/06 to 29/05/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	5 days
Tuesday	6 days
Wednesday	3 days
Thursday	3 days
Friday	4 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	21 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	10
Edge of Town	11

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	17
No Sub Category	4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	21	177	0.076	21	177	0.270	21	177	0.346
08:00 - 09:00	21	177	0.141	21	177	0.409	21	177	0.550
09:00 - 10:00	21	177	0.159	21	177	0.218	21	177	0.377
10:00 - 11:00	21	177	0.136	21	177	0.163	21	177	0.299
11:00 - 12:00	21	177	0.173	21	177	0.171	21	177	0.344
12:00 - 13:00	21	177	0.192	21	177	0.177	21	177	0.369
13:00 - 14:00	21	177	0.193	21	177	0.180	21	177	0.373
14:00 - 15:00	21	177	0.187	21	177	0.195	21	177	0.382
15:00 - 16:00	21	177	0.269	21	177	0.204	21	177	0.473
16:00 - 17:00	21	177	0.309	21	177	0.193	21	177	0.502
17:00 - 18:00	21	177	0.373	21	177	0.226	21	177	0.599
18:00 - 19:00	21	177	0.273	21	177	0.222	21	177	0.495
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.481			2.628			5.109

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 437 (units:)
Survey date date range:	01/02/06 - 29/05/13
Number of weekdays (Monday-Friday):	21
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	21	177	0.004	21	177	0.003	21	177	0.007
08:00 - 09:00	21	177	0.002	21	177	0.003	21	177	0.005
09:00 - 10:00	21	177	0.002	21	177	0.002	21	177	0.004
10:00 - 11:00	21	177	0.002	21	177	0.002	21	177	0.004
11:00 - 12:00	21	177	0.002	21	177	0.002	21	177	0.004
12:00 - 13:00	21	177	0.002	21	177	0.002	21	177	0.004
13:00 - 14:00	21	177	0.003	21	177	0.002	21	177	0.005
14:00 - 15:00	21	177	0.003	21	177	0.003	21	177	0.006
15:00 - 16:00	21	177	0.004	21	177	0.003	21	177	0.007
16:00 - 17:00	21	177	0.003	21	177	0.003	21	177	0.006
17:00 - 18:00	21	177	0.005	21	177	0.004	21	177	0.009
18:00 - 19:00	21	177	0.002	21	177	0.003	21	177	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.034			0.032			0.066

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 437 (units:)
Survey date date range:	01/02/06 - 29/05/13
Number of weekdays (Monday-Friday):	21
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	21	177	0.003	21	177	0.002	21	177	0.005
08:00 - 09:00	21	177	0.003	21	177	0.003	21	177	0.006
09:00 - 10:00	21	177	0.003	21	177	0.003	21	177	0.006
10:00 - 11:00	21	177	0.004	21	177	0.004	21	177	0.008
11:00 - 12:00	21	177	0.003	21	177	0.004	21	177	0.007
12:00 - 13:00	21	177	0.004	21	177	0.004	21	177	0.008
13:00 - 14:00	21	177	0.002	21	177	0.005	21	177	0.007
14:00 - 15:00	21	177	0.002	21	177	0.003	21	177	0.005
15:00 - 16:00	21	177	0.002	21	177	0.002	21	177	0.004
16:00 - 17:00	21	177	0.001	21	177	0.002	21	177	0.003
17:00 - 18:00	21	177	0.000	21	177	0.001	21	177	0.001
18:00 - 19:00	21	177	0.001	21	177	0.001	21	177	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.028			0.034			0.062

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 437 (units:)
Survey date date range:	01/02/06 - 29/05/13
Number of weekdays (Monday-Friday):	21
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	21	177	0.000	21	177	0.000	21	177	0.000
08:00 - 09:00	21	177	0.001	21	177	0.001	21	177	0.002
09:00 - 10:00	21	177	0.000	21	177	0.000	21	177	0.000
10:00 - 11:00	21	177	0.000	21	177	0.000	21	177	0.000
11:00 - 12:00	21	177	0.000	21	177	0.000	21	177	0.000
12:00 - 13:00	21	177	0.000	21	177	0.000	21	177	0.000
13:00 - 14:00	21	177	0.001	21	177	0.001	21	177	0.002
14:00 - 15:00	21	177	0.000	21	177	0.000	21	177	0.000
15:00 - 16:00	21	177	0.001	21	177	0.001	21	177	0.002
16:00 - 17:00	21	177	0.000	21	177	0.001	21	177	0.001
17:00 - 18:00	21	177	0.000	21	177	0.000	21	177	0.000
18:00 - 19:00	21	177	0.000	21	177	0.000	21	177	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.003			0.004			0.007

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 437 (units:)
Survey date date range:	01/02/06 - 29/05/13
Number of weekdays (Monday-Friday):	21
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	21	177	0.006	21	177	0.010	21	177	0.016
08:00 - 09:00	21	177	0.004	21	177	0.016	21	177	0.020
09:00 - 10:00	21	177	0.006	21	177	0.006	21	177	0.012
10:00 - 11:00	21	177	0.003	21	177	0.006	21	177	0.009
11:00 - 12:00	21	177	0.004	21	177	0.004	21	177	0.008
12:00 - 13:00	21	177	0.006	21	177	0.006	21	177	0.012
13:00 - 14:00	21	177	0.005	21	177	0.006	21	177	0.011
14:00 - 15:00	21	177	0.006	21	177	0.005	21	177	0.011
15:00 - 16:00	21	177	0.016	21	177	0.009	21	177	0.025
16:00 - 17:00	21	177	0.009	21	177	0.007	21	177	0.016
17:00 - 18:00	21	177	0.014	21	177	0.011	21	177	0.025
18:00 - 19:00	21	177	0.012	21	177	0.006	21	177	0.018
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.091			0.092			0.183

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 437 (units:)
Survey date date range:	01/02/06 - 29/05/13
Number of weekdays (Monday-Friday):	21
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : B - HOUSES FOR RENT
VEHICLES

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Number of dwellings
Actual Range:	16 to 280 (units:)
Range Selected by User:	11 to 516 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/02/06 to 18/06/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	3 days
Tuesday	2 days
Thursday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	4
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	5
Built-Up Zone	1
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - HOUSES FOR RENT
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	88	0.063	7	88	0.176	7	88	0.239
08:00 - 09:00	7	88	0.131	7	88	0.252	7	88	0.383
09:00 - 10:00	7	88	0.105	7	88	0.128	7	88	0.233
10:00 - 11:00	7	88	0.115	7	88	0.139	7	88	0.254
11:00 - 12:00	7	88	0.154	7	88	0.150	7	88	0.304
12:00 - 13:00	7	88	0.133	7	88	0.138	7	88	0.271
13:00 - 14:00	7	88	0.173	7	88	0.129	7	88	0.302
14:00 - 15:00	7	88	0.157	7	88	0.176	7	88	0.333
15:00 - 16:00	7	88	0.196	7	88	0.141	7	88	0.337
16:00 - 17:00	7	88	0.231	7	88	0.149	7	88	0.380
17:00 - 18:00	7	88	0.275	7	88	0.188	7	88	0.463
18:00 - 19:00	7	88	0.181	7	88	0.139	7	88	0.320
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.914			1.905			3.819

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	16 - 280 (units:)
Survey date date range:	01/02/06 - 18/06/13
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - HOUSES FOR RENT
TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	88	0.006	7	88	0.010	7	88	0.016
08:00 - 09:00	7	88	0.000	7	88	0.005	7	88	0.005
09:00 - 10:00	7	88	0.005	7	88	0.008	7	88	0.013
10:00 - 11:00	7	88	0.006	7	88	0.015	7	88	0.021
11:00 - 12:00	7	88	0.010	7	88	0.008	7	88	0.018
12:00 - 13:00	7	88	0.005	7	88	0.006	7	88	0.011
13:00 - 14:00	7	88	0.002	7	88	0.003	7	88	0.005
14:00 - 15:00	7	88	0.011	7	88	0.008	7	88	0.019
15:00 - 16:00	7	88	0.018	7	88	0.013	7	88	0.031
16:00 - 17:00	7	88	0.018	7	88	0.006	7	88	0.024
17:00 - 18:00	7	88	0.011	7	88	0.011	7	88	0.022
18:00 - 19:00	7	88	0.006	7	88	0.003	7	88	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.098			0.096			0.194

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	16 - 280 (units:)
Survey date date range:	01/02/06 - 18/06/13
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - HOUSES FOR RENT
OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	88	0.000	7	88	0.000	7	88	0.000
08:00 - 09:00	7	88	0.005	7	88	0.002	7	88	0.007
09:00 - 10:00	7	88	0.005	7	88	0.003	7	88	0.008
10:00 - 11:00	7	88	0.003	7	88	0.008	7	88	0.011
11:00 - 12:00	7	88	0.000	7	88	0.000	7	88	0.000
12:00 - 13:00	7	88	0.000	7	88	0.000	7	88	0.000
13:00 - 14:00	7	88	0.002	7	88	0.000	7	88	0.002
14:00 - 15:00	7	88	0.003	7	88	0.003	7	88	0.006
15:00 - 16:00	7	88	0.000	7	88	0.000	7	88	0.000
16:00 - 17:00	7	88	0.000	7	88	0.000	7	88	0.000
17:00 - 18:00	7	88	0.000	7	88	0.000	7	88	0.000
18:00 - 19:00	7	88	0.003	7	88	0.005	7	88	0.008
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.021			0.021			0.042

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	16 - 280 (units:)
Survey date date range:	01/02/06 - 18/06/13
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - HOUSES FOR RENT
PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	88	0.000	7	88	0.000	7	88	0.000
08:00 - 09:00	7	88	0.000	7	88	0.000	7	88	0.000
09:00 - 10:00	7	88	0.002	7	88	0.002	7	88	0.004
10:00 - 11:00	7	88	0.000	7	88	0.000	7	88	0.000
11:00 - 12:00	7	88	0.002	7	88	0.002	7	88	0.004
12:00 - 13:00	7	88	0.000	7	88	0.000	7	88	0.000
13:00 - 14:00	7	88	0.002	7	88	0.002	7	88	0.004
14:00 - 15:00	7	88	0.000	7	88	0.000	7	88	0.000
15:00 - 16:00	7	88	0.000	7	88	0.000	7	88	0.000
16:00 - 17:00	7	88	0.000	7	88	0.000	7	88	0.000
17:00 - 18:00	7	88	0.000	7	88	0.000	7	88	0.000
18:00 - 19:00	7	88	0.000	7	88	0.000	7	88	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.006			0.006			0.012

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	16 - 280 (units:)
Survey date date range:	01/02/06 - 18/06/13
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - HOUSES FOR RENT
CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	88	0.003	7	88	0.002	7	88	0.005
08:00 - 09:00	7	88	0.003	7	88	0.006	7	88	0.009
09:00 - 10:00	7	88	0.000	7	88	0.008	7	88	0.008
10:00 - 11:00	7	88	0.002	7	88	0.002	7	88	0.004
11:00 - 12:00	7	88	0.003	7	88	0.003	7	88	0.006
12:00 - 13:00	7	88	0.010	7	88	0.003	7	88	0.013
13:00 - 14:00	7	88	0.008	7	88	0.003	7	88	0.011
14:00 - 15:00	7	88	0.000	7	88	0.002	7	88	0.002
15:00 - 16:00	7	88	0.006	7	88	0.003	7	88	0.009
16:00 - 17:00	7	88	0.010	7	88	0.002	7	88	0.012
17:00 - 18:00	7	88	0.003	7	88	0.008	7	88	0.011
18:00 - 19:00	7	88	0.010	7	88	0.010	7	88	0.020
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.058			0.052			0.110

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	16 - 280 (units:)
Survey date date range:	01/02/06 - 18/06/13
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-346901-150401-0438

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : B - BUSINESS PARK
VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	DC	DORSET	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
05	EAST MIDLANDS		
	NT	NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	LC	LANCASHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
Actual Range: 1050 to 7600 (units: sqm)
Range Selected by User: 975 to 10000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/04/07 to 23/04/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Wednesday	1 days
Thursday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Commercial Zone	1
Retail Zone	1
Built-Up Zone	1
No Sub Category	3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out

Filtering Stage 3 selection:

Use Class:

B1	6 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	1 days
10,001 to 15,000	1 days
15,001 to 20,000	1 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
100,001 to 125,000	1 days
125,001 to 250,000	2 days
250,001 to 500,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	6 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	DC-02-B-01	BUSINESS PARK		DORSET
	COMMERCIAL ROAD			
	POOLE			
	Suburban Area (PPS6 Out of Centre)			
	Built-Up Zone			
	Total Gross floor area:		1570 sqm	
	Survey date: THURSDAY		17/07/08	Survey Type: MANUAL
2	LC-02-B-03	BUSINESS PARK		LANCASHIRE
	NAVIGATION WAY			
	PRESTON			
	Edge of Town			
	Commercial Zone			
	Total Gross floor area:		3450 sqm	
	Survey date: TUESDAY		18/10/11	Survey Type: MANUAL
3	NF-02-B-02	BUSINESS PARK		NORFOLK
	WHITING ROAD			
	LONG JOHN'S HILL			
	NORWICH			
	Edge of Town			
	Retail Zone			
	Total Gross floor area:		7400 sqm	
	Survey date: THURSDAY		17/05/07	Survey Type: MANUAL
4	NT-02-B-01	BUSINESS PARK		NOTTINGHAMSHIRE
	PARK LANE			
	NOTTINGHAM			
	Suburban Area (PPS6 Out of Centre)			
	No Sub Category			
	Total Gross floor area:		2321 sqm	
	Survey date: THURSDAY		17/05/07	Survey Type: MANUAL
5	SH-02-B-03	BUSINESS CENTRE		SHROPSHIRE
	CASTLE STREET			
	HADLEY			
	TELFORD			
	Suburban Area (PPS6 Out of Centre)			
	No Sub Category			
	Total Gross floor area:		1300 sqm	
	Survey date: TUESDAY		16/06/09	Survey Type: MANUAL
6	WY-02-B-02	BUSINESS PARK		WEST YORKSHIRE
	ARMITAGE BRIDGE			
	HUDDERSFIELD			
	Edge of Town			
	No Sub Category			
	Total Gross floor area:		9200 sqm	
	Survey date: WEDNESDAY		23/04/14	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	6	3780	0.040	6	3780	0.013	6	3780	0.053
07:30 - 08:00	6	3780	0.282	6	3780	0.031	6	3780	0.313
08:00 - 08:30	6	3780	0.401	6	3780	0.066	6	3780	0.467
08:30 - 09:00	6	3780	0.824	6	3780	0.132	6	3780	0.956
09:00 - 09:30	6	3780	0.604	6	3780	0.115	6	3780	0.719
09:30 - 10:00	6	3780	0.238	6	3780	0.154	6	3780	0.392
10:00 - 10:30	6	3780	0.229	6	3780	0.150	6	3780	0.379
10:30 - 11:00	6	3780	0.084	6	3780	0.093	6	3780	0.177
11:00 - 11:30	6	3780	0.132	6	3780	0.150	6	3780	0.282
11:30 - 12:00	6	3780	0.154	6	3780	0.185	6	3780	0.339
12:00 - 12:30	6	3780	0.163	6	3780	0.260	6	3780	0.423
12:30 - 13:00	6	3780	0.181	6	3780	0.273	6	3780	0.454
13:00 - 13:30	6	3780	0.234	6	3780	0.251	6	3780	0.485
13:30 - 14:00	6	3780	0.291	6	3780	0.106	6	3780	0.397
14:00 - 14:30	6	3780	0.150	6	3780	0.181	6	3780	0.331
14:30 - 15:00	6	3780	0.163	6	3780	0.150	6	3780	0.313
15:00 - 15:30	6	3780	0.150	6	3780	0.225	6	3780	0.375
15:30 - 16:00	6	3780	0.168	6	3780	0.265	6	3780	0.433
16:00 - 16:30	6	3780	0.154	6	3780	0.331	6	3780	0.485
16:30 - 17:00	6	3780	0.088	6	3780	0.353	6	3780	0.441
17:00 - 17:30	6	3780	0.137	6	3780	0.573	6	3780	0.710
17:30 - 18:00	6	3780	0.075	6	3780	0.578	6	3780	0.653
18:00 - 18:30	5	3016	0.080	5	3016	0.385	5	3016	0.465
18:30 - 19:00	5	3016	0.053	5	3016	0.186	5	3016	0.239
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			5.075			5.206			10.281

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	1050 - 7600 (units: sqm)
Survey date date range:	01/04/07 - 23/04/14
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
TAXIS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	6	3780	0.009	6	3780	0.009	6	3780	0.018
07:30 - 08:00	6	3780	0.009	6	3780	0.009	6	3780	0.018
08:00 - 08:30	6	3780	0.004	6	3780	0.004	6	3780	0.008
08:30 - 09:00	6	3780	0.018	6	3780	0.018	6	3780	0.036
09:00 - 09:30	6	3780	0.018	6	3780	0.018	6	3780	0.036
09:30 - 10:00	6	3780	0.018	6	3780	0.013	6	3780	0.031
10:00 - 10:30	6	3780	0.009	6	3780	0.009	6	3780	0.018
10:30 - 11:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:00 - 11:30	6	3780	0.004	6	3780	0.004	6	3780	0.008
11:30 - 12:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
12:00 - 12:30	6	3780	0.000	6	3780	0.004	6	3780	0.004
12:30 - 13:00	6	3780	0.009	6	3780	0.004	6	3780	0.013
13:00 - 13:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
13:30 - 14:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:00 - 14:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:30 - 15:00	6	3780	0.009	6	3780	0.009	6	3780	0.018
15:00 - 15:30	6	3780	0.004	6	3780	0.000	6	3780	0.004
15:30 - 16:00	6	3780	0.018	6	3780	0.022	6	3780	0.040
16:00 - 16:30	6	3780	0.009	6	3780	0.004	6	3780	0.013
16:30 - 17:00	6	3780	0.000	6	3780	0.004	6	3780	0.004
17:00 - 17:30	6	3780	0.004	6	3780	0.009	6	3780	0.013
17:30 - 18:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
18:00 - 18:30	5	3016	0.007	5	3016	0.007	5	3016	0.014
18:30 - 19:00	5	3016	0.000	5	3016	0.000	5	3016	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.153			0.151			0.304

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	1050 - 7600 (units: sqm)
Survey date date range:	01/04/07 - 23/04/14
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
07:30 - 08:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
08:00 - 08:30	6	3780	0.009	6	3780	0.009	6	3780	0.018
08:30 - 09:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
09:00 - 09:30	6	3780	0.004	6	3780	0.004	6	3780	0.008
09:30 - 10:00	6	3780	0.009	6	3780	0.009	6	3780	0.018
10:00 - 10:30	6	3780	0.004	6	3780	0.009	6	3780	0.013
10:30 - 11:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:00 - 11:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:30 - 12:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
12:00 - 12:30	6	3780	0.004	6	3780	0.004	6	3780	0.008
12:30 - 13:00	6	3780	0.018	6	3780	0.004	6	3780	0.022
13:00 - 13:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
13:30 - 14:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
14:00 - 14:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:30 - 15:00	6	3780	0.018	6	3780	0.013	6	3780	0.031
15:00 - 15:30	6	3780	0.013	6	3780	0.018	6	3780	0.031
15:30 - 16:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
16:00 - 16:30	6	3780	0.000	6	3780	0.004	6	3780	0.004
16:30 - 17:00	6	3780	0.004	6	3780	0.009	6	3780	0.013
17:00 - 17:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
17:30 - 18:00	6	3780	0.009	6	3780	0.009	6	3780	0.018
18:00 - 18:30	5	3016	0.000	5	3016	0.000	5	3016	0.000
18:30 - 19:00	5	3016	0.000	5	3016	0.000	5	3016	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.104			0.104			0.208

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	1050 - 7600 (units: sqm)
Survey date date range:	01/04/07 - 23/04/14
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
PSVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
07:30 - 08:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
08:00 - 08:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
08:30 - 09:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
09:00 - 09:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
09:30 - 10:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
10:00 - 10:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
10:30 - 11:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:00 - 11:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:30 - 12:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
12:00 - 12:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
12:30 - 13:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
13:00 - 13:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
13:30 - 14:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
14:00 - 14:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:30 - 15:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
15:00 - 15:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
15:30 - 16:00	6	3780	0.004	6	3780	0.004	6	3780	0.008
16:00 - 16:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
16:30 - 17:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
17:00 - 17:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
17:30 - 18:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
18:00 - 18:30	5	3016	0.000	5	3016	0.000	5	3016	0.000
18:30 - 19:00	5	3016	0.000	5	3016	0.000	5	3016	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.012			0.012			0.024

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	1050 - 7600 (units: sqm)
Survey date date range:	01/04/07 - 23/04/14
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK
CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
07:30 - 08:00	6	3780	0.013	6	3780	0.004	6	3780	0.017
08:00 - 08:30	6	3780	0.009	6	3780	0.000	6	3780	0.009
08:30 - 09:00	6	3780	0.031	6	3780	0.000	6	3780	0.031
09:00 - 09:30	6	3780	0.009	6	3780	0.000	6	3780	0.009
09:30 - 10:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
10:00 - 10:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
10:30 - 11:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:00 - 11:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
11:30 - 12:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
12:00 - 12:30	6	3780	0.004	6	3780	0.000	6	3780	0.004
12:30 - 13:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
13:00 - 13:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
13:30 - 14:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:00 - 14:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
14:30 - 15:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
15:00 - 15:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
15:30 - 16:00	6	3780	0.000	6	3780	0.000	6	3780	0.000
16:00 - 16:30	6	3780	0.000	6	3780	0.000	6	3780	0.000
16:30 - 17:00	6	3780	0.004	6	3780	0.013	6	3780	0.017
17:00 - 17:30	6	3780	0.000	6	3780	0.018	6	3780	0.018
17:30 - 18:00	6	3780	0.000	6	3780	0.035	6	3780	0.035
18:00 - 18:30	5	3016	0.000	5	3016	0.000	5	3016	0.000
18:30 - 19:00	5	3016	0.000	5	3016	0.000	5	3016	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.070			0.070			0.140

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	1050 - 7600 (units: sqm)
Survey date date range:	01/04/07 - 23/04/14
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.