LAND WEST OF RAYLEIGH

Environmental Statement
Appendix G
Transport Assessment & Travel Plan

08 / 2014

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TRANSPORT ASSESSMENT

AUGUST 2014

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TRANSPORT ASSESSMENT

AUGUST 2014
Countryside Properties
West of Rayleigh

Rayleigh
Transport Assessment

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Introduction

1.1 This Transport Assessment has been prepared on behalf of Countryside Properties, to support an application for up to 500 residential units, a Primary School, and the provision of non-residential floorspace (uses falling within Use Classes A1, A3, C2, D1a or D1b) at West of Rayleigh, in Rayleigh, Essex, within the SER1 site which has been allocated for 550 residential units. The location of the proposed development is shown in Figure 1.1.

![Location of the Site](image)

Figure 1.1: Location of the Site

1.2 This report has been prepared in accordance with the Department for Transport document 'Guidance on transport assessment'. Therefore, this report considers the following:

- In Section 2: the relevant transport Policy Framework in relation to the proposed development
- In Section 3: the details if the proposed development, including access and parking
- In Section 4: the existing transport conditions in the area surrounding the site
In Section 5: the existing traffic flows and details of surveys that have been undertaken
In Section 6: the projected trip generation and traffic impacts
In Section 7: the proposed mitigation measures
In Section 8: the conclusions to this report

Executive Summary

1.3 This Transport Assessment has been prepared on behalf of Countryside Properties, to support an application for up to 500 residential units and a Primary School, at West of Rayleigh, in Rayleigh, Essex, within the SER1 site which has been allocated for 550 residential units. For the purpose of the Transport Assessment a rigorous assessment of 520 units, within the application boundary has been made.

1.4 The Transport Assessment has considered both how the proposed development would work on its own, but also how it would work with the other sites planned to come forward in Rayleigh, namely:
   - Hullbridge (Up to 500 units)
   - Rawreth Lane Industrial Estate (up to 220 units)

1.5 Following agreement with the Local Highway Authority, Essex County Council (ECC) a spreadsheet model has been prepared to assign the trips from the proposed development, but also to consider the cumulative impact of the other sites. Using this spreadsheet, six key junctions were identified for detailed analysis. The operation of the following junctions was assessed in detailed.
   - Chelmsford Road/London Road
   - Rawreth Lane/Industrial Access
   - Hullbridge Road/Rawreth Lane
   - Chelmsford Road/Rawreth Lane
   - London Road Proposed Access
   - Rawreth Lane Proposed Access

1.6 The analysis concluded that the proposed development would not lead to serious harm to the operation of any of the junctions, which is the relevant test as set out in NPPF. However, it is acknowledged that queueing occurs on London Road particularly in the pm peak and that queuing occurs at the Rawreth Lane/Hullbridge Road mini roundabout particularly in both peaks. Therefore the operation of the London Road and
Rawreth Lane corridors has been considered in detail and mitigation measures have been developed and discussed with the local Highway Authority.

1.7 For the London Road, a series of measures have been developed which include for;

- Introducing a two lane merge for traffic exiting the Chelmsford Road roundabout to London Road eastbound
- Amending the signalised junction at Victoria Avenue / London Road
- Introducing ghost right hand turn lanes for eastbound traffic on London Road
- Signalising the Down Hall Road / London Road junction
- Introducing box junction road markings at the London Hill / Station Hill priority junction

1.8 These measures would provide an overall benefit to the operation of the London Road corridor above which is a requirement of development proposals to facilitate in accordance with NPPF. Therefore subject to further to detailed examination to be undertaken by Essex County Council, the Local Highway Authority, it is proposed that either Countryside Properties would either implement certain measures pursuant to a S278 Agreement, subject to an assessment of development impact and overall discussions regarding S106 contributions, or make a proportional contribution, with the remaining measures implemented through S106 contributions from other developments coming forward, together with other Local Highways Monies that are available.

1.9 For Rawreth Lane, whilst the detailed analysis of the Rawreth Lane/Hullbridge Road junction has shown that the proposed development make a limited impact in terms of existing queuing, it is acknowledged that ECC are developing proposals to mitigate the operation of this junction and Countryside Properties would propose to make a proportional contribution towards the implementation of this improvement and the measures proposed to alleviate queuing on London Road, subject to overall S106 Discussions.

1.10 Encouraging as many trips as possible to be made by means other than the private car is a key part of the Transport Strategy for the proposed development and Countryside Properties would implement a series of measures to encourage trips to be made by means other than the private car, which include;

- Bus Service to serve the site
- Free Bus Travel
- Cycle Proposals
- Travel Packs for Residents
- Smarter Choices Campaign
- Travel Plan
- Improved Connections on Foot to the Local Schools
2 Policy Framework

2.1 This Section will set out the relevant transport policies, including:
- National Planning Policy Framework (NPPF)
- Essex County Council (ECC) Local Transport Plan
- Rochford District Council Core Strategy
- Rochford District Council Allocations Plan

2.2 The details of these are set out in the following paragraphs.

National Planning Policy Framework (NPPF)

2.3 The National Planning Policy Framework was adopted in March 2012 and replaced PPG13 as the National Planning Policy.

2.4 In respect of Transport, Section 4 of the NPPF relates to ‘Supporting Sustainable Transport’. In particular:

“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.” (NPPF Paragraph 32).

2.5 In relation to location of development:

“Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised. However this needs to take account of policies set out elsewhere in this Framework, particularly in rural areas.”

Conclusion to National Planning Policy Framework

2.6 It is considered that the proposed development satisfies the relevant Policies of the National Planning Policy Framework, and that the proposals will not result in residual
impacts which would be 'severe'. This is demonstrated in Sections 6 and 7 of this Transport Assessment.


2.7 The ECC Local Transport Plan consists of a Transport Strategy and Implementation Plan. The strategy sets out what the County want to achieve in the long term. The implementation plan sets out how they will achieve the outcomes.

2.8 The vision for ECC, as stated in the Executive Summary of the Transport Strategy, states:

- "Provide connectivity for Essex communities and international gateways to support sustainable economic growth and regeneration"
- "Reduce carbon dioxide emissions and improve air quality through lifestyle changes, innovation and technology"
- "Improve safety on the transport network and enhance and promote a safe travelling environment"
- "Secure and maintain all transport assets to an appropriate standard and ensure that the network is available for use"
- "Provide sustainable access and travel choice for Essex residents to help create sustainable communities." (Essex Transport Strategy, page iv)

2.9 Furthermore, the vision for transport in Essex is set out in paragraph 2.2, which states: "a transport system which supports sustainable economic growth and helps deliver the best quality of life for the residents of Essex." (Essex Transport Strategy, paragraph 2.2)

2.10 In respect of Public Transport, Policy 4 (page 54) of the Essex Transport Strategy states:

"The County Council will develop the public transport network to assist economic growth and improve access to essential services by:

- focusing development and improvement on a network of core bus routes linking locations that attract significant numbers of people;
- working with commercial bus service operators to improve service reliability, punctuality and accessibility;
- continuing to work in partnership with train operating companies and Network Rail to improve rail services;"
• working with bus and train operators to improve integration between bus and rail services;
• working towards the introduction of multi-operator ticketing;
• managing the English National Concessionary Travel Scheme for Essex;
• ensuring that accurate and up-to-date service information is made available through a range of media;
• working with the police and public transport operators to reduce crime and fear of crime when travelling on the transport network; and
• lobbying Government for increased local involvement in the planning and provision of local rail and more effective partnership working with operators over the provision of bus services” (Essex Transport Strategy, page 54)

2.11 The proposals for West of Rayleigh include for a bus service to be introduced through the site, to serve the railway station. There will also be a number of marketing measures, including free bus travel and bus and rail information, provided for residents, to encourage the use of public transport use.

2.12 In respect of Connectivity, Policy 5 (page 56) of the Essex Transport Strategy states:

“Transport networks will be strengthened to support a vibrant, successful and sustainable future for Essex by:
• improving travel links within and between our main towns;
• focusing investment on routes where improvements will give the greatest benefit to the economy of Essex;
• improving journey times and journey-time reliability by targeting congestion improvement measures (see Policy 10);
• providing for the use of more sustainable forms of travel (see Policy 5);
• ensuring international gateways have effective surface access strategies that promote appropriate and sustainable transport;
• developing appropriate provision of park and ride facilities serving our main towns;
• working with partner agencies to identify and deliver essential improvements to nationally important road and rail connections.” (Essex Transport Strategy, page 56)

2.13 As set out in paragraph 2.11, the proposals for West of Rayleigh include a number of measures will be provided for the proposed development to encourage the use of public transport and sustainable travel. Also, a number of measures have been identified to mitigate traffic impacts along London Road, as set out in Section 7, in line with Policy 5.
2.14 In relation to Carbon Reduction, Policy 7 (page 68) of the Essex Transport Strategy states:

"Essex County Council will support and encourage the use of lower carbon travel by:

- promoting the use of more sustainable forms of travel (Policy 8);
- ensuring new developments minimise the number and length of trips made by private vehicles (Policy 2);
- supporting use of emerging low-carbon technologies to reduce carbon emissions from transport sources;
- ensuring the Essex road network operates efficiently to minimise CO2 emissions from vehicles; and
- adopting measures to improve energy efficiency and further reduce carbon emissions arising from our own activities." (Essex Transport Strategy, page 68)

2.15 As set out in paragraph 2.11, the proposals for West of Rayleigh include a number of measures will be provided for the proposed development to encourage the use of public transport and sustainable travel. Also, a number of measures have been identified to mitigate traffic impacts along London Road, as set out in Section 7, in line with Policy 7.

2.16 In relation to sustainable travel, Policy 8 (page 70) of the Essex Transport Strategy states:

"The County Council will encourage the use of more sustainable forms of travel by:

- consistently supporting and promoting sustainable travel;
- providing infrastructure for sustainable transport;
- working with partners and service providers to promote the use of sustainable forms of travel and to identify new ways to provide services;
- requiring effective travel planning for proposed developments in line with the Council’s current development management policies;
- developing effective travel plans with existing work places, schools, and other locations that attract a significant number of people;
- promoting access by sustainable forms of transport to the county’s railway stations, ports and airports." (Essex Transport Strategy, page 70)

2.17 Section 7 sets out the proposed mitigation measures for the proposed development, which includes a bus service and free bus travel, a Travel Plan and a Smarter Choices campaign to encourage sustainable travel for the residents of West of Rayleigh and the surrounding residential areas, which is in line with Policy 8.
2.18 In relation to road safety, Policy 10 (page 82) of the Essex Transport Strategy states:

"The County Council will work to reduce the incidence and severity of road traffic collisions on roads in Essex by:

- continuing to work within the strong partnership framework provided by the Essex Casualty & Congestion Reduction Board;
- prioritising measures which reduce the number of people killed or seriously injured;
- ensuring Safety Audits are undertaken of all proposed designs of new highway schemes or proposals to materially alter the existing public highway." (Essex Transport Strategy, page 82)

2.19 This Transport Assessment, has undertaken analysis of the existing accident statistics for London Road, which shows that there are some areas of accident blackspots. However, the mitigation measures shown in Section 7 for London Road, would improve the safety along the corridor. Furthermore, the proposed access junctions will be subject to Safety Audits, in line with Policy 10.

2.20 In relation to cycling, Policy 14 (page 115) of the Essex Transport Strategy states:

"The County Council will encourage cycling by:

- promoting the benefits of cycling;
- continuing to improve the cycling facilities within the main urban areas of Basildon, Chelmsford, Colchester and Harlow; The Essex Transport Strategy developing existing cycling networks in other towns where cycling offers an appropriate local solution;
- working with schools and employers to improve facilities for cyclists;
- improving access to local services by integrating the Public Rights of Way, walking and cycling networks to form continuous routes; and
- providing training opportunities to school children and adults" (Essex Transport Strategy, page 115)

2.21 As part of the mitigation strategy, a cycling package is proposed to encourage the use of cycling by residents, which includes an on-site cycle training system, cycle maps and information provided to residents and secure cycle parking in line with local standards.

2.22 In relation to walking, Policy 15 (page 116) of the Essex Transport Strategy states:

"The County Council will promote walking and use of the Public Rights of Way network by:

- promoting the benefits of walking;
- facilitating a safe and pleasant walking environment that is accessible to all;
• improving the signage of walking routes;
• ensuring that the public rights of way network is well maintained and easy to use by walkers, cyclists and equestrians.” (Essex Transport Strategy, page 116)

2.23 The Travel Plan includes the promotion of walking to residents, through the Travel Packs and provision of information, as well as a network of footways throughout the site connecting to the existing area. This is set out in more detail in the Design and Access Statement which supports the application.

**Conclusion to Essex Transport Strategy: the Local Transport Plan for Essex**

2.24 It is considered that the proposed development for Land west of Rayleigh support the aims and objectives of the ECC Essex Strategy: the Local Transport Plan, and does not prejudice the proposed transport schemes coming forward in the area.

**Rochford District Borough Local Plan**

2.25 The Council’s planning policies are currently in a transition period. The policies in the 2006 Replacement Local Plan (adopted on 16 June 2006) were due to expire on 16 June 2009 unless the Council applied to the Secretary of State responsible for planning for them to be saved. The majority of these policies were saved by the Secretary of State until they are replaced by policies in the Local Development Framework (LDF).

2.26 The LDF is a collection of documents which together will form the development plan for the District and will set out policies which all planning applications are assessed against. The LDF has replaced the majority of saved policies in the 2006 Replacement Local Plan.

2.27 The main document forming part of the LDF is the Core Strategy which was adopted on 13 December 2011 and replaces a number of the saved Local Plan policies. The relevant Transport Policies have been replaced in the Core Strategy, and therefore the Local Plan Saved Policies has not been considered in this Transport Assessment. The relevant Core Strategy Policies are set out in the following paragraphs.

**Rochford District Council Core Strategy**

2.28 The Council’s corporate vision is shared with that of the Local Strategic Partnership:

‘To make Rochford District a place which provides opportunities for the best possible quality of life for all who live, work and visit here’ (Core Strategy, paragraph 3.5)

2.29 In relation to transport, Section 10 of the Core Strategy sets out the vision and policies. The short term, medium and on term visions include:

“Short Term
Transport schemes have been initiated to help reduce congestion on the District’s roads, such as online road improvements and the implementation of travel plans.

Improvements have led to a more frequent reliable and comprehensive public transport system with better linkages between bus and rail

Work will be undertaken within the County Council as highway authority to look at potential solutions to congestion issues across the District to ensure the highway infrastructure becomes ‘fit for purpose’

The Rochford District Council Transportation Strategy Supplementary Planning Document has been adopted and will help ease transport issues across the District

Medium Term

A walking cycling and bridleway network has been implemented across the District.

There is improved public access to the District’s rivers

Residential development will have considered community facilities provision and access to these will be easy and sustainable

Appropriate infrastructure will have been put into place to secure access to the wharfare at Baltic Wharf, thus helping to secure its future as an employment area

The South Essex Rapid Transit System (SERT) has been implemented giving people a genuine sustainable alternative to the private car

Long Term

Developer contributions have been ensured that new developments are well integrated with public transport. Cycle and pedestrian networks have been developed lining important areas

The new employment park is accompanied by a travel plan and is accessible to workers by a range of transport options

Road infrastructure through the District will have been secured and improved with easier access to the A127 and A130

Wallasea Island will be accessible by improved road access

The employment park in the west of the district will have easy access on to the main transport networks” (Core Strategy, Section 10, page 104)

2.30 In terms of the objectives of the Core Strategy, page 105 stats:

“to deliver developments that will reduce the reliance on the private car, and that are well related to the public transport network

To deliver online improvements on the east to west road networks in partnership with the Highways Authority, Essex County Council
To identify and assess locations in the District that currently suffer from poor highway connectivity and congestion, and work with the Highways Authority to identify solutions.

To work alongside Essex County Council and other Thames Gateway authorities to support the implementation of the South Essex Rapid Transit system, in particular ensuring that SERT connects the residential areas with the employment areas within Rochford District.

To ensure that all new developments including residential, employment, education and leisure implement travel plans to reduce the reliance on the private car.

To work with Essex County Council and other organisations, such as Sustrans, to ensure that a safe, accessible and convenient network of cycle and pedestrian routes is implemented across the District.

To aid the delivery of greenways identified in the Thames Gateway Green Grid Strategy, alongside Essex County Council and neighbouring authorities.

To ensure appropriate car parking provisions accompanies development at a level which strikes a balance between meeting the needs of motorists, ensuring that parking does not take up excessive amounts of developable land, and encouraging alternative car use." (Core Strategy, Section 10, page 105)

2.31 In terms of the Transport Policies, policies T1 and T2 relate to highways, which state:

"Policy T1 - Highways

Developments will be required to be located and designed in such a way as to reduce reliance on the private car. However, some impact on the highway network is inevitable and the Council will work with developers and the Highways Authority to ensure that appropriate improvements are carried out. The Council will seek developer contributions where necessary.

The Council will work with the Highways Authority to deliver online improvements to the east to west road network, and improvements to the highways serving Baltic Wharf in order to sustain employment in this rural part of the District. The Council will also work with the Highways Authority to find ways to manage congestion along specific routes in the District."

Policy T2 - Highways Improvements

2.32 The Council will work with Essex County Council Highways Authority to ensure that highway improvements are implemented to address issues of congestion, road flooding
and poor signage. In particular, highway improvements to the following will be prioritised:

- Brays Lane, Ashingdon (improved to access to King Edmund School);
- Ashingdon Road to improve traffic flows and reduce congestion;
- Rectory Road/Ashingdon Road Roundabout;
- Watery Lane;
- Spa Road/Main Road Roundabout Hockley;
- Rayleigh Weir junction;
- Enhancements to the B1013 to improve traffic flows and reduce congestion; and
- Surface access to London Southend Airport.

It should however be noted that Rochford District Council is not the Highway Authority and as such does not have responsibility for the Highway network. The Council will however work closely with the Highway Authority, Essex County Council, in order to ensure any proposed schemes in Rochford are given the appropriate priority” (Core Strategy, Policies T1 and T2)

2.33 A package of measures are set out in Section 7, which involves a number of highway improvements along London Road, as well as a number of measures to encourage trips by sustainable modes from the proposed development. This is in line with Policies T1 and T2.

2.34 In respect of public transport, Policies T3 and T4 state:

“Policy T3 – Public Transport

Development must be well related to public transport, or accessible by means other than the private car.

In particular, large-scale residential developments will be required to be integrated with public transport and designed in a way that encourages the use of alternative forms of transport to the private car.

Where developments are not well located to such infrastructure, and alternatives are not available, contributions towards sustainable transport infrastructure will be sought.

The Council will work with developers, public transport operators and Essex County Council to ensure that new developments are integrated into the public transport system and, where necessary, public transport infrastructure is upgraded and marketing, publicity and travel incentives are provided.
The Council recognise that public transport is provided in the District as a commercial enterprise and, as such, it is important to ensure that developments are planned in a manner such that the provision of public transport to them is economically viable for operators. Nevertheless, the provision of public transport services and facilities is socially important, and contributes to equality of access to services. The Council will seek to ensure that good public transport links continue to be provided to the town centres.

Policy T4 – South Essex Rapid Transit (SERT)

The Council will work with Essex County Council to support the implementation of SERT. The Council will seek to ensure that SERT connects the District's residential areas with employment opportunities (particularly London Southend Airport and environs) and, where this is the case, assist Essex County Council in implementing dedicated routes and measures to ensure that SERT vehicles have priority over other traffic.” (Core Strategy, Policies T3 and T4)

2.35 As set out in paragraph 2.11, the proposals for West of Rayleigh include a number of measures will be provided for the proposed development to encourage the use of public transport and sustainable travel. Also, a number of measures have been identified to mitigate traffic impacts along London Road, as set out in Section 7, in line with Policies T3 and T4.

2.36 Policy T5 relates to Travel Plans:

“Travel plans will be required for developments involving both destinations and trip origins. New schools, visitor attractions, leisure uses and larger employment developments will be required to devise and implement a travel plan, which aims to reduce private, single occupancy car use. Existing schools and employers will be encouraged to implement travel plans.

A travel plan will be required for any residential development comprising 50 or more units and should be tailored to meet the specific requirements of the development.” (Core Strategy, Policy T5)

2.37 A Travel Plan is proposed for West of Rayleigh, which has been tailored for the proposed development. A Draft Travel Plan is contained in Appendix F.

2.38 In relation to cycling and walking, Policy T6 states:

“The Council will work with Essex County Council, along with other organisations such as Sustrans, to ensure that a safe and convenient network of cycle and pedestrian routes is put in place to link homes, workplaces, services and town centres. Where
developments generate a potential demand to travel, developers will be required to contribute to the delivery of such a network. The Council will also continue to require developers to provide facilities for cyclists at all new developments.

The Council will also seek the further development of cyclepaths, footpaths and bridleways that, having regard to ecological interests, open up and develop the access network alongside the District’s rivers.

The Council will also encourage new cycle and footpath links with neighbouring authorities” (Core Strategy, Policy T6)

2.39 A cycle package is proposed, as set out in Section 7, to encourage cycling to and from the proposed development, which includes an on-site training scheme, cycle maps and information for residents as well as safe and secure cycle parking in line with local standards. The proposed development will also include a network of cycle paths throughout the site, which is set out in more detail in the Design and Access Statement, which supports this application.

2.40 Policy T8 relates to parking standards:

“The Council will apply minimum parking standards, including visitor parking, to residential development. The Council will be prepared to relax such standards for residential development within town centre locations and sites in close proximity to any of the District’s train stations.

Whilst applying maximum parking standards for trip destinations, the Council will still require such development to include adequate parking provision. Developers will be required to demonstrate that adequate provision for the parking, turning, loading and unloading of service vehicles has been provided” (Core Strategy, Policy T8)

2.41 Parking provision is proposed in line with the local standards.

Rochford District Council Allocations Plan

2.42 The Allocations Plan identifies specific sites for a range of uses in accordance with the Core Strategy. The Allocations Plan was adopted on 25 February 2014 and replaces the 2006 Replacement Local Plan Proposals Map.

2.43 West of Rayleigh is one of the sites identified in the Allocations Plan (SER1). Full analysis of the allocations plan is contained in the Planning Statement, which supports this planning application.
Conclusion to Rochford District Local Plan

2.44 The site at Rayleigh is an allocated site within the Allocations Plan. The proposals for the development are in accordance with the relevant transport policies contained within the Local Plan and Core Strategy and will assist in achieving the vision for the District.

Conclusions to this section

2.45 It is considered that the proposed development are consistent with National, Regional and Local Planning Policies.
3 Proposed Development Details

3.1 The proposals include for up to 500 residential units at West of Rayleigh with a Primary School on site. There is also potential for some community/commercial facilities on the north eastern part of the site, falling within Use Classes A1, A3, C2, D1a or D1b.

Site Access

3.2 It is proposed that a link road is provided between London Road and Rawreth Lane, which will run to the east of the existing pylons. There will be three access points to the proposed development, one at either end of the proposed link road and a further access on to the Industrial Estate Access Road.

3.3 The three access points will be in the form of priority junctions, with priority given to London Road at the southern access, Rawreth Lane at the northern access and the Industrial Estate Access Road on the eastern access.

3.4 The proposed master plan and link road alignment is shown in Figure 3.1 with the proposed accesses shown in Figures 3.2-3.5. Full size Access Proposals Plans are contained in Appendix A.

Figure 3.1: Proposed Land Use Plan
Figure 3.2: Proposed Accesses Rawreth Lane

Figure 3.3: Proposed Accesses London Road
3.5 The third access, shown in Figure 3.4 is not considered to be one of the main access points, and it is anticipated that the majority of vehicles entering or exiting the site would use the north and south access points on Rawreth Lane and London Road.

3.6 Further information on the design of the proposed development, is considered in the Design and Access Statement, which accompanies the planning application.

Access by Bus

3.7 The site and link road has been designed so that a bus can route through the site, so that the residents can benefit from a bus service to encourage sustainable travel. The route is demonstrated in Figure 3.5.
Figure 3.5: Potential Bus Loop

Access on Foot

3.8 The plan shows that potential footway links to the east of the proposed development, onto Rawreth Lane Industrial Estate Access Road, could be accommodated. This could provide potential access to St Nicolas Primary School, should the Primary School on site not come forward. This is set out in detail in Section 7 of this report.
4 Existing Transport Conditions

4.1 This section of the report looks at the existing accessibility of the site in relation to:
- The Existing Site Information
- The Local Highways Network
- Existing Bus Routes and Stops
- The Location and Services of the Railway Station
- Existing Pedestrian and Cycle Routes
- The location of Local Amenities
- Accident Statistics
- The Existing Transport Statistics for the area

4.2 These are discussed in the subsequent paragraphs.

The Existing Site Information

4.3 As stated in the introduction to this report, the site has been allocated for the development of up to 550 residential dwellings, in the Rochford Local Development Framework, Allocations Document, which was adopted on the 25th February 2014. This application represents the parcel of land under the control of Countryside Properties. At present, the site is being used as agricultural land.

The Local Highways Network

4.4 The local Highways Network in relation to the proposed site is shown in Figure 4.1.
Figure 4.1: The Proposed Site in Relation to the Local Highways Network

4.5 The site is located to the north of the A129 (London Road) which is where one of the site accesses will be taken from. The A129 is a link road between the railway stations of Shenfield and Rayleigh. It provides access to the A1245 to the west of the proposed development, which links the A130 and A13 to the south and the A130 and A12 to the south and provides connection to the A127.

Existing Bus Routes and Stops

4.6 The nearest existing bus stops to the site are approximately 50m from the London Road access, which serves the 11a, 25, 251 and X30 bus services; and 350m from the Rawreth Lane access, which serves the number 3 bus service. The site in relation to the bus routes is shown in Figure 4.2.
Figure 4.2: Bus Stops and Bus Routes in Relation to the Site

4.7 **Table 4.1** sets out the details of the bus routes, shown in **Figure 4.2**.
Countryside Properties  
West of Rayleigh  
Transport Assessment

<table>
<thead>
<tr>
<th>Bus Service</th>
<th>Bus Route</th>
<th>Timetable</th>
</tr>
</thead>
</table>
| 1           | Southend to Rayleigh, via Hadleigh, South Benfleet and Thundersley | Mon to Fri: Every 10 mins  
Sat: Every 12 mins  
Sun: Every 30 mins |
| 3/3A/3B/3C  | Oxney Green to Southend, via Chelmsford, Rayleigh and Hadleigh     | Mon to Fri: Every 1 hour  
Sat: Every 2 hours  
Sun: No service |
| 7/8         | Rayleigh to North Shoebury, via Hockley and Southend              | Mon to Fri: Every 30 mins  
Sat: Every 30 mins  
Sun: Every 30 mins |
| 9           | Rayleigh to Shoeburyness, via Eastwood, Prittlewell and Southend  | Mon to Fri: Every 12 mins  
Sat: Every 12 mins  
Sun: Every 30 mins |
| 11a (Sunday only service) | Chelmsford to Temple Farm Industrial Estate, via Rayleigh  | Mon to Fri: No service  
Sat: No service  
Sun: Every 2 hours |
| 20          | Hullbridge to Southend, via Rayleigh and Eastwood                | Mon to Fri: Every 15 mins  
Sat: Every 15 mins  
Sun: Every 30 mins |
| 25/25A      | Basildon to Southend, via Wickford and Rayleigh                 | Mon to Fri: Every 15 mins  
Sat: Every 15 mins  
Sun: Every 1 hour |
| 251 (Sunday only service) | Brentwood to Southend, via Billericay, Wickford and Rayleigh | Mon to Fri: No service  
Sat: No service  
Sun: Every 2 hours |
| X30         | Stansted Airport to Southend-on-Sea, via Chelmsford and Rayleigh  | Mon to Fri: Every 1 hour  
Sat: Every 1 hour  
Sun: Every 1 hour |

**Table 4.1: Existing Bus Services Information**

4.8 It can be seen that there are existing bus services in the vicinity of the site, which serve a variety of destinations.

**The Location and Services of the Railway Station**

4.9 Rayleigh Station is located approximately 2km from the site, and can be accessed using the existing bus services. The rail connections map from Rayleigh Station is shown in **Figure 4.3**.
Figure 4.3: Rail Connections from Rayleigh Station

4.10 Figure 4.3 shows that Rayleigh Station provides direct connections to Victoria Southend Central, Southend Airport, Stratford and Liverpool Street, with connections and to Chelmsford, Colchester, Ipswich and Norwich with convenient interchange. Rayleigh Station runs three trains in each direction per hour.

Existing Cycle Routes

4.11 At present, there are no dedicated on-road or off-road routes within the vicinity of the site. However, there are a number of quieter roads which would be suitable for cyclists to access the local facilities.

The location of Local Amenities

4.12 We have also looked at the local amenities in relation to the site, which is shown in Figure 4.8, with details of the local amenities set out in Table 4.2.
Figure 4.8: The Location of Local Amenities in Relation to the Proposed Site

<table>
<thead>
<tr>
<th>Type of Amenity</th>
<th>Name and Location</th>
<th>Distance (taken from nearest access point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor</td>
<td>Downhall Park Surgery, 49 Rawreth Lane</td>
<td>1.12km</td>
</tr>
<tr>
<td>General Store</td>
<td>Tesco Express, 123 London Road</td>
<td>970m</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Grange Pharmacy, 113 London Road</td>
<td>970m</td>
</tr>
<tr>
<td>Primary School</td>
<td>St Nicolas C of E Primary School, Priory Chase</td>
<td>1.12km</td>
</tr>
<tr>
<td>Public House/Restaurant</td>
<td>Hungry Horse - The Travellers Joy, Downhall Road</td>
<td>1.6km</td>
</tr>
<tr>
<td>Secondary School</td>
<td>The Sweye Park School, Sir Walter Rayleigh Drive</td>
<td>1.28km</td>
</tr>
<tr>
<td>Supermarket</td>
<td>ASDA Stores, Rawreth Lane</td>
<td>640m</td>
</tr>
<tr>
<td>Take-away</td>
<td>Silver City, London Road</td>
<td>480m</td>
</tr>
</tbody>
</table>

Table 4.2: Details of the Local Amenities

4.13 It can be seen that the site is well located in relation to local amenities, including an ASDA Stores Supermarket within 650m of the Rawreth Lane site access and a Tesco Express within 1km of the London Road site access, which will encourage residents to walk or cycle to their local amenities.

Accident Statistics

4.14 We have analysed the existing accident statistics for the key roads in the local highway network surrounding the site, using the Crash Map database (www.crashmap.co.uk),
from which we have looked at data for the most recent five year period (2008-2012). The accident locations have been plotted onto a plan, which is shown in Figure 4.9.

Figure 4.9: Accident Statistics

4.15 **Figure 4.9** shows that there have been no fatal accidents in the last 5 years. However, there have been a cluster of slight/serious accidents along the eastern end of London Road. This will be assisted by the proposals for London Road, as set out in the Mitigation section of this report.

**Existing Statistics**

4.16 We have obtained data from National Statistics 2011 Census Data, to understand the existing method of travel to work for residents.

4.17 **Table 4.3** sets out the existing method of travel to work data, from the 2011 Census.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Usual Residents Aged 16 to 74</td>
<td>2397</td>
<td>36605</td>
<td>2688084</td>
<td>23813153</td>
</tr>
<tr>
<td>Underground, Metro, Light Rail, Tram</td>
<td>7</td>
<td>0.29%</td>
<td>118</td>
<td>0.31%</td>
</tr>
<tr>
<td>Train</td>
<td>487</td>
<td>20.32%</td>
<td>6423</td>
<td>16.64%</td>
</tr>
<tr>
<td>Bus, Minibus or Coach</td>
<td>69</td>
<td>2.88%</td>
<td>1333</td>
<td>3.45%</td>
</tr>
<tr>
<td>Taxi</td>
<td>12</td>
<td>0.50%</td>
<td>173</td>
<td>0.45%</td>
</tr>
<tr>
<td>Motorcycle, Scooter or Moped</td>
<td>25</td>
<td>1.04%</td>
<td>311</td>
<td>0.81%</td>
</tr>
<tr>
<td>Driving a Car or Van</td>
<td>1571</td>
<td>65.54%</td>
<td>25450</td>
<td>65.92%</td>
</tr>
<tr>
<td>Passenger in a Car or Van</td>
<td>81</td>
<td>3.38%</td>
<td>1753</td>
<td>4.54%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>26</td>
<td>1.08%</td>
<td>511</td>
<td>1.32%</td>
</tr>
<tr>
<td>On Foot</td>
<td>109</td>
<td>4.55%</td>
<td>2346</td>
<td>6.08%</td>
</tr>
<tr>
<td>Other Method of Travel to Work</td>
<td>10</td>
<td>0.42%</td>
<td>187</td>
<td>0.48%</td>
</tr>
</tbody>
</table>

**Table 4.3: Existing Mode of Travel to Work 2011 Census Data**

4.18 **Table 4.3** shows that in terms of the use of car or van to travel to work, the census data shows that the Ward is consistent with the District and Region. The Ward has the highest level of travel by train and the lowest of number of people travelling on foot.

**Conclusion to this section**

4.19 This section has demonstrated that the site is well located in relation to accessibility by means other than the private car, with 3 regular bus routes, which link the site to the town centre and the railway station, and the ability to walk and cycle to a number of local amenities, which will encourage residents of the site to travel by sustainable means, and to create a culture of sustainable travel from the outset.
5 Trip Generation and Distribution

5.1 A Technical Note has been prepared to set out the highways implications for the proposed development, which is contained in Appendix B, and is summarised in this Section.

5.2 The proposed methodology follows a methodology agreed for other developments, in particular which have involved working with ECC, namely Maltings Lane Development in Witham, Beaulieu Park Development in Chelmsford.

5.3 The methodology involves deriving initial trip rates for both of the proposed sites in Rayleigh. The methodology is summarised below. It is proposed to use the unadjusted trip rates, representing a rigorous assessment of the proposed development impacts.

- **Step 1**
  - Determine initial vehicle trip rates

- **Step 2**
  - Disaggregate vehicle trip rates by journey purpose using data from the National Travel Survey to give:
    - Work, Leisure, Shopping, School, Other

- **Step 3**
  - Calculate the distribution of trips by journey purpose

- **Step 4**
  - Assessing the Traffic Impacts
Development Options Being Tested

5.4 This section of the note sets out the development options that are being tested.

5.5 In addition to the assessment of the impact of the proposed West of Rayleigh development, the development of Hullbridge is also addressed for comparison as part of sensitivity tests.

*West of Rayleigh*

5.6 The proposals for this site include:
- Up to 500 residential units in total (plus 20 additional units tested)
- Link road between the two development areas
- There is also potential for some community/commercial facilities on the north eastern part of the site, falling within Use Classes A1, A3, C2, D1a or D1b.

5.7 It is considered that the commercial/community uses will either be accessed by traffic from the proposed development or existing traffic using Rawreth Lane, during the peak periods and the implications are considered to be understood through the sensitivity tests that have been undertaken.

*Hullbridge*

5.8 Up to 500 residential units in total.

*Rawreth Industrial Estate*

5.9 Up to 220 residential units in total.

Overview of Development Options

5.10 Development options to be tested in comparison with the 2013 base models for each junction are:
- Test 1 - 500 + 20 units (520) for West of Rayleigh
- Test 2 - The total developable area within the SER1 allocation including the Application Site (550 dwellings, plus 10% for sensitivity testing purposes = 605)
- Test 3 - SER 1 with 10% sensitivity (605 dwellings) + Hullbridge (500 dwellings)
- Test 4 - SER 1 with 10% sensitivity (605 dwellings) + Hullbridge (500 dwellings) + Rawreth Industrial Estate (220 dwellings)

5.11 These tests allow a worst case impact to be understood with Test 4, which includes for all planned development.

5.12 The following paragraphs sets out Steps 1 to 4 for each site individually.
Initial Trip Rates – Step 1

5.13 The base trip rates, proposed to be used are shown in Table 5.1, with the estimated trips for each site contained in Table 5.2. The trip rates are based on trip rates previously used and agreed with ECC for residential developments in Essex.

<table>
<thead>
<tr>
<th></th>
<th>Arrivals</th>
<th>Departures</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak - 0800-0900</td>
<td>0.16</td>
<td>0.41</td>
<td>0.57</td>
</tr>
<tr>
<td>PM Peak 1700-1800</td>
<td>0.38</td>
<td>0.24</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Table 5.1: AM and PM peak Non-Adjusted Trip Rates for the residential uses (Car Trips/Household/Hour)

<table>
<thead>
<tr>
<th>West of Rayleigh – 520 units</th>
<th>Arrivals</th>
<th>Departures</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak - 0800-0900</td>
<td>83</td>
<td>212</td>
<td>295</td>
</tr>
<tr>
<td>PM Peak 1700-1800</td>
<td>199</td>
<td>124</td>
<td>323</td>
</tr>
<tr>
<td>SER1 – 605 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak - 0800-0900</td>
<td>92</td>
<td>236</td>
<td>328</td>
</tr>
<tr>
<td>PM Peak 1700-1800</td>
<td>222</td>
<td>139</td>
<td>361</td>
</tr>
<tr>
<td>Hullbridge – 500 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak - 0800-0900</td>
<td>80</td>
<td>204</td>
<td>284</td>
</tr>
<tr>
<td>PM Peak 1700-1800</td>
<td>191</td>
<td>120</td>
<td>311</td>
</tr>
<tr>
<td>Rawreth Industrial Estate – 220 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak - 0800-0900</td>
<td>35</td>
<td>90</td>
<td>125</td>
</tr>
<tr>
<td>PM Peak 1700-1800</td>
<td>84</td>
<td>53</td>
<td>137</td>
</tr>
</tbody>
</table>

Table 5.2: AM and PM peak Non-Adjusted Vehicle trips

Allocation of Trip Rates by Journey Purpose – Step 2

5.14 To allow for a robust understanding of the impacts of the scheme a different trip distribution has been derived dependent upon the purpose of the journey. This takes into account the fact that for example School related trips are generally of a shorter distance than trips to work. This also allows for the consideration of the impacts of internalisation and further adjustments to the non-car package, which clearly have a different effect dependent upon journey purpose.

5.15 Therefore the base vehicle trip rates have been disaggregated for the peak hours based on data provided in the Department for Transport’s National Travel Survey database on the vehicle trips in progress by time of day, main mode and purpose: Great Britain: 2005-2009, into the following purposes:

- Work
- School
5.16 **Table 5.3** shows a summary of the data used. The raw data provided by DfT is also in the proposed development’s trip generation spreadsheet model, which forms **Appendix C** of this report.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Work</th>
<th>School</th>
<th>Leisure</th>
<th>Shopping</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800-0900</td>
<td>27.77%</td>
<td>47.08%</td>
<td>3.43%</td>
<td>4.44%</td>
<td>17.28%</td>
<td>100%</td>
</tr>
<tr>
<td>1700-1800</td>
<td>38.28%</td>
<td>3.61%</td>
<td>19.57%</td>
<td>12.20%</td>
<td>26.34%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 5.3:** Split in purpose of car journeys on the road during peak times
(Source: DfT)

5.17 In order to take account of modal variance of journey purpose an additional table from the DfT has been used in conjunction with **Table 5.3**. This additional data is provided in ‘NTS0409 – Average number of trips by purpose and main mode’.

5.18 NTS0409 has been used to derive a modal split by journey purpose, specifically the proportion of car drivers. This modal split is presented below in **Table 5.4**:

<table>
<thead>
<tr>
<th>Journey Purpose</th>
<th>% as Car Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>60%</td>
</tr>
<tr>
<td>School</td>
<td>22%</td>
</tr>
<tr>
<td>Leisure</td>
<td>37%</td>
</tr>
<tr>
<td>Shopping</td>
<td>44%</td>
</tr>
<tr>
<td>Other</td>
<td>53%</td>
</tr>
</tbody>
</table>

**Table 5.4:** Percentage of Journeys as Car Drivers

5.19 **Table 5.3** and **Table 5.4** have been used in conjunction to weight the Trip Rate Split by Journey Purpose to the level of car usage.

5.20 The resultant Trip Rates Split of Car Drivers by Journey Purpose is presented below in **Table 5.5**:

<table>
<thead>
<tr>
<th>Time</th>
<th>Work</th>
<th>School</th>
<th>Leisure</th>
<th>Shopping</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800-0900</td>
<td>42.3%</td>
<td>26.3%</td>
<td>3.2%</td>
<td>5.0%</td>
<td>23.2%</td>
<td>100%</td>
</tr>
<tr>
<td>1700-1800</td>
<td>45.6%</td>
<td>1.6%</td>
<td>14.4%</td>
<td>10.7%</td>
<td>27.7%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 5.5:** Trip Rates Split of Car Drivers by Journey Purpose

5.21 From **Table 5.2** combined with **Table 5.5**, disaggregated trip rates by journey purpose have been produced and are presented in **Table 5.6**. The resultant vehicle trips calculated for each development are shown in **Table 5.7**.
<table>
<thead>
<tr>
<th>Trip Purpose</th>
<th>0800-0900</th>
<th></th>
<th>1700-1800</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arr</td>
<td>Dep</td>
<td>Arr</td>
<td>Dep</td>
</tr>
<tr>
<td>Work</td>
<td>0.07</td>
<td>0.17</td>
<td>0.17</td>
<td>0.11</td>
</tr>
<tr>
<td>Primary School*</td>
<td>0.03</td>
<td>0.06</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Secondary School*</td>
<td>0.02</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Leisure</td>
<td>0.01</td>
<td>0.01</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Shopping</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Other</td>
<td>0.04</td>
<td>0.09</td>
<td>0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Total Residential</td>
<td>0.16</td>
<td>0.41</td>
<td>0.38</td>
<td>0.24</td>
</tr>
</tbody>
</table>

*Primary and Secondary School trip rates have been split proportionally from the overall school trip rate using typical pupil numbers expected at the development*

Table 5.6: Trip rates for Each Residential Development AM and PM Peak by purpose
<table>
<thead>
<tr>
<th>Site</th>
<th>Trip Purpose</th>
<th>0800-0900</th>
<th>1700-1800</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Arr</td>
<td>Dep</td>
</tr>
<tr>
<td>Work</td>
<td>35</td>
<td>90</td>
<td>91</td>
</tr>
<tr>
<td>Primary School</td>
<td>13</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td>Secondary School</td>
<td>9</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Leisure</td>
<td>3</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Shopping</td>
<td>4</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>49</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total Residential</strong></td>
<td><strong>83</strong></td>
<td><strong>212</strong></td>
<td><strong>199</strong></td>
</tr>
<tr>
<td>SER1 – 605 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>41</td>
<td>104</td>
<td>105</td>
</tr>
<tr>
<td>Primary School</td>
<td>15</td>
<td>39</td>
<td>2</td>
</tr>
<tr>
<td>Secondary School</td>
<td>10</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Leisure</td>
<td>3</td>
<td>8</td>
<td>33</td>
</tr>
<tr>
<td>Shopping</td>
<td>5</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>57</td>
<td>64</td>
</tr>
<tr>
<td><strong>Total Residential</strong></td>
<td><strong>96</strong></td>
<td><strong>246</strong></td>
<td><strong>231</strong></td>
</tr>
<tr>
<td>Hullbridge – 500 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>34</td>
<td>86</td>
<td>87</td>
</tr>
<tr>
<td>Primary School</td>
<td>13</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>Secondary School</td>
<td>8</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Leisure</td>
<td>3</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>Shopping</td>
<td>4</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>47</td>
<td>53</td>
</tr>
<tr>
<td><strong>Total Residential</strong></td>
<td><strong>80</strong></td>
<td><strong>204</strong></td>
<td><strong>191</strong></td>
</tr>
<tr>
<td>Rawreth Industrial Estate – 220 units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>15</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Primary School</td>
<td>6</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Secondary School</td>
<td>4</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Leisure</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Shopping</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total Residential</strong></td>
<td><strong>35</strong></td>
<td><strong>90</strong></td>
<td><strong>84</strong></td>
</tr>
</tbody>
</table>

Table 5.7: Number Trips for Each Residential Development AM and PM Peak by Purpose

**Calculation of the Car Driver Trip Distribution – Step 3**

5.22 All data used to inform the final distribution, and the calculations involved, are included in the Trip Generation Spreadsheet – Appendix C.

5.23 As set out above, vehicle trips are distributed in accordance with journey purpose; namely:
   - Work Trips
• Shopping Trips
• Leisure Trips
• School Trips
• Other Trips

5.24 We have set out in this section the distribution used for the different journey purposes, for both of the sites. These are set out in the following paragraphs.

West of Rayleigh/SER1

5.25 The distribution for each purpose is set out below, with a plan showing the location of amenities for each purpose shown in Figure 6.1.

5.26 Because of the nature of the proposals with two discrete residential areas without a link road, the distributions are different for both accesses to and from the proposed development.

Work Trips

5.27 These trips have been distributed in accordance with the Census Travel to Work data for the ward of Downhall and Rawreth in Rayleigh.

Shopping

5.28 A gravity function has been applied to calculate the distribution of shopping trips, based on the size and distance from the site. In Figure 5.1, places for shopping are shown in Green, and are numbered 1-3.

5.29 The Shopping distribution for the North and South access is shown in Table 5.8.

<table>
<thead>
<tr>
<th>Access</th>
<th>Shopping Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Access</td>
<td>1. ASDA</td>
<td>0.5 km</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>2. Iceland</td>
<td>2.5 km</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>3. Co-op</td>
<td>2.2 km</td>
<td>3%</td>
</tr>
<tr>
<td>South Access</td>
<td>Rayleigh Town Centre</td>
<td>2.0 km</td>
<td>31%</td>
</tr>
</tbody>
</table>

Table 5.8: Distribution of Shopping Trips for West of Rayleigh/SER1

Leisure

5.30 A gravity function has been applied to calculate the distribution of leisure trips, based on the size and distance from the site. In Figure 5.1, places for Leisure are shown in Burgundy, and are numbered 1-6.

5.31 The Leisure distribution for the North and South access is shown in Table 5.9.
Table 5.9: Distribution of Leisure Trips for West of Rayleigh/SER1

<table>
<thead>
<tr>
<th>Access</th>
<th>Leisure Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Access</td>
<td>4. Virgin Active</td>
<td>0.6 km</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>5. Fishery</td>
<td>1.1 km</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>6. The Rayleigh Club</td>
<td>2.0 km</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>1. Community Centre</td>
<td>0.7 km</td>
<td>21%</td>
</tr>
<tr>
<td>South Access</td>
<td>2. Self-defence club</td>
<td>1.1 km</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>3. Sports &amp; Social club</td>
<td>0.6 km</td>
<td>29%</td>
</tr>
</tbody>
</table>

School

5.32 These are split by Primary and Secondary School.

5.33 In terms of Pupil numbers the estimated number of pupils is shown in Table 5.10, for Primary and Secondary based upon 520 residential units.

Table 5.10: Expected Number of School Pupils for West of Rayleigh/SER1

<table>
<thead>
<tr>
<th>No. of Houses</th>
<th>No. of Pupils Per Unit - Primary</th>
<th>Primary School Pupils</th>
<th>No. of Pupils Per Unit - Secondary</th>
<th>Secondary School Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>520</td>
<td>0.3</td>
<td>156</td>
<td>0.2</td>
<td>104</td>
</tr>
</tbody>
</table>

Primary School

5.34 For primary schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. Primary Schools are shown in Pink in Figure 5.1, and are numbered 1-11.

5.35 The resulting primary school distribution for the North and South access is shown in Table 5.11. It is noted that the schools listed will have different selection criteria, but bearing in mind that the proposed development allows for a Primary School, the assignment of traffic to offsite schools represents a worst case traffic assessment.

Table 5.11: Distribution of Primary School Trips for West of Rayleigh/SER1

<table>
<thead>
<tr>
<th>Access</th>
<th>Primary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Access</td>
<td>2. Down Hall</td>
<td>2.1 km</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>6. St Nicholas C of E</td>
<td>0.6 km</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>1. Our Lady of Ransom</td>
<td>0.5 km</td>
<td>72%</td>
</tr>
<tr>
<td>South Access</td>
<td>3. Giebe Infant School</td>
<td>1.6 km</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>4. Edward Francis</td>
<td>2.4 km</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>5. Rayleigh Primary School</td>
<td>2.4 km</td>
<td>3%</td>
</tr>
</tbody>
</table>

Secondary School

5.36 For Secondary Schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. The distance of the schools and the distribution to each school is shown in Table 5.12. Secondary Schools are shown in Blue in Figure 5.1, and are numbered 1 and 2.
### Table 5.12: Distribution of Secondary School Trips for West of Rayleigh/SER1

<table>
<thead>
<tr>
<th>Access</th>
<th>Secondary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Access</td>
<td>1. Sweyne Park School</td>
<td>1.1 km</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>2. Fitzwimarc School</td>
<td>2.4 km</td>
<td>19%</td>
</tr>
</tbody>
</table>

**Other Trips**

5.37 These trips have been distributed between North London (25% of trips), Central London (25%), Chelmsford (25%) and Rayleigh Town Centre (25%).

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**Figure 5.1: Study Area Amenities Plan with places of Education, Shopping and Leisure**

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Hullbridge

5.38 The distribution for each purpose is set out below, with a plan showing the location of amenities for each purpose is shown in Figure 5.2.

Work Trips

5.39 These trips have been distributed in accordance with the Census Travel to Work data for the ward of Hullbridge north of Rayleigh.

Shopping

5.40 A gravity function has been applied to calculate the distribution of shopping trips, based on the size and distance from the site. In Figure 5.2, places for shopping are shown in Green, and are numbered 1 and 2.

5.41 The Shopping distribution for the Hullbridge access is shown in Table 5.13.

<table>
<thead>
<tr>
<th>Shopping Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ASDA</td>
<td>3.1 km</td>
<td>65%</td>
</tr>
<tr>
<td>2. Budgens</td>
<td>0.3 km</td>
<td>35%</td>
</tr>
</tbody>
</table>

Table 5.13: Distribution of Shopping Trips for Hullbridge

Leisure

5.42 A gravity function has been applied to calculate the distribution of leisure trips, based on the size and distance from the site. In Figure 5.2, places for leisure are shown in Orange, and are numbered 1-9.

5.43 The Shopping distribution for the Hullbridge access is shown in Table 5.14.

<table>
<thead>
<tr>
<th>Leisure Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sports and Social club</td>
<td>0.8 km</td>
<td>34%</td>
</tr>
<tr>
<td>2. Fishery</td>
<td>1.4 km</td>
<td>11%</td>
</tr>
<tr>
<td>3. The Rayleigh Club</td>
<td>1.1 km</td>
<td>18%</td>
</tr>
<tr>
<td>4. Community Centre</td>
<td>1.6 km</td>
<td>8%</td>
</tr>
<tr>
<td>5. Dance</td>
<td>1.0 km</td>
<td>22%</td>
</tr>
<tr>
<td>6. Equestrian Centre</td>
<td>2.6 km</td>
<td>3%</td>
</tr>
<tr>
<td>7. Virgin Active</td>
<td>3.1 km</td>
<td>2%</td>
</tr>
<tr>
<td>8. SaliCoats Park</td>
<td>10.3 km</td>
<td>0%</td>
</tr>
<tr>
<td>9. Bowling</td>
<td>4.0 km</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 5.14: Distribution of Leisure Trips for Hullbridge

School

5.44 These are split by Primary and Secondary School. In terms of Pupil numbers the estimated number of pupils is shown in Table 5.15, for Primary and Secondary based upon 500 residential units.
<table>
<thead>
<tr>
<th>No. of Houses</th>
<th>No. of Pupils Per Unit - Primary</th>
<th>No. of Pupils Per Unit - Secondary</th>
<th>Secondary School Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>0.3</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5.15: Expected Number of School Pupils for the Hullbridge Development

**Primary School**

5.45 For Primary Schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. The distance of the schools and the distribution to each school is shown in Table 5.16. Primary Schools are shown in Red in Figure 5.2, and are numbered 1-8.

<table>
<thead>
<tr>
<th>Primary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Riverside</td>
<td>1.0 km</td>
<td>83%</td>
</tr>
<tr>
<td>2. Down Hall</td>
<td>2.7 km</td>
<td>10%</td>
</tr>
<tr>
<td>3. St Nicholas C of E</td>
<td>3.1 km</td>
<td>3%</td>
</tr>
<tr>
<td>4. Collingwood</td>
<td>11.4 km</td>
<td>1%</td>
</tr>
<tr>
<td>5. Elmwood</td>
<td>10.3 km</td>
<td>1%</td>
</tr>
<tr>
<td>6. St Josephs</td>
<td>11.1 km</td>
<td>0%</td>
</tr>
<tr>
<td>7. Trinity St Mary's C of E</td>
<td>11.1 km</td>
<td>0%</td>
</tr>
<tr>
<td>8. Rettendon</td>
<td>5.1 km</td>
<td>1%</td>
</tr>
<tr>
<td>9. Hilltop Junior School</td>
<td>9.7 km</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 5.16: Hullbridge Development distribution to the Local Primary Schools

**Secondary School**

5.46 For Secondary Schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. The distance of the schools and the distribution to each school is shown in Table 5.17. Secondary Schools are shown in Blue in Figure 5.2, and are numbered 1 to 5.

<table>
<thead>
<tr>
<th>Secondary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Greensward Academy</td>
<td>6.9 km</td>
<td>15%</td>
</tr>
<tr>
<td>2. Swayne Park School</td>
<td>3.9 km</td>
<td>36%</td>
</tr>
<tr>
<td>3. William De Ferrers Centre</td>
<td>10.9 km</td>
<td>1%</td>
</tr>
<tr>
<td>4. Fitzwimarc School</td>
<td>3.7 km</td>
<td>43%</td>
</tr>
<tr>
<td>5. Beauchamps High School</td>
<td>9.5 km</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 5.17: Hullbridge Development distribution to the Local Secondary Schools

**Other Trips**

5.47 These trips have been distributed between North London (25% of trips), Central London (25%), Chelmsford (25%) and Rayleigh Town Centre (25%).
Figure 5.2: Hullbridge Development Amenities Plan with places of Education, Shopping and Leisure

**Rawreth Industrial Estate**

5.48 The distribution for each purpose is set out below, with a plan showing the location of amenities for each purpose shown in Figure 5.3, the same set of amenities as for West of Rayleigh/SER1.
5.49 Due to the close proximity of the Rawreth Industrial Estate to the northern access of West of Rayleigh/SER1 the distribution remains identical but for all trips to be measured to be distributed from the northern access.

*Work Trips*

5.50 These trips have been distributed in accordance with the Census Travel to Work data for the ward of Downhall and Rawreth in Rayleigh.

*Shopping*

5.51 A gravity function has been applied to calculate the distribution of shopping trips, based on the size and distance from the site. In Figure 5.3, places for shopping are shown in Green, and are numbered 1-3.

5.52 The Shopping distribution for the North and South access is shown in Table 5.18.

<table>
<thead>
<tr>
<th>Shopping Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ASDA</td>
<td>0.5 km</td>
<td>79%</td>
</tr>
<tr>
<td>2. Iceland</td>
<td>3.7 km</td>
<td>1%</td>
</tr>
<tr>
<td>3. Co-op</td>
<td>3.4 km</td>
<td>2%</td>
</tr>
<tr>
<td>Rayleigh Town Centre</td>
<td>3.0 km</td>
<td>18%</td>
</tr>
</tbody>
</table>

Table 5.18: Distribution of Shopping Trips for Rawreth Industrial Estate

*Leisure*

5.53 A gravity function has been applied to calculate the distribution of leisure trips, based on the size and distance from the site. In Figure 5.3, places for Leisure are shown in Burgundy, and are numbered 1-6.

5.54 The Leisure distribution for the Rawreth Industrial Estate access is shown in Table 5.19.

<table>
<thead>
<tr>
<th>Leisure Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Community Centre</td>
<td>2.9 km</td>
<td>3%</td>
</tr>
<tr>
<td>2. Self-defence club</td>
<td>3.7 km</td>
<td>2%</td>
</tr>
<tr>
<td>3. Sports &amp; Social club</td>
<td>3.2 km</td>
<td>2%</td>
</tr>
<tr>
<td>4. Virgin Active</td>
<td>0.6 km</td>
<td>67%</td>
</tr>
<tr>
<td>5. Fishery</td>
<td>1.1 km</td>
<td>20%</td>
</tr>
<tr>
<td>6. The Rayleigh Club</td>
<td>2.0 km</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 5.19: Distribution of Leisure Trips for Rawreth Industrial Estate

*School*

5.55 These are split by Primary and Secondary School.

5.56 In terms of Pupil numbers the estimated number of pupils is shown in Table 5.20, for Primary and Secondary based upon 520 residential units.
<table>
<thead>
<tr>
<th>No. of Houses</th>
<th>No. of Pupils Per Unit - Primary</th>
<th>Primary School Pupils</th>
<th>No. of Pupils Per Unit - Secondary</th>
<th>Secondary School Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>0.3</td>
<td>66</td>
<td>0.2</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 5.20: Expected Number of School Pupils for West of Rayleigh/SER1

### Primary School

5.57 For primary schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. Primary Schools are shown in Pink in Figure 5.3, and are numbered 1-11.

5.58 The resulting primary school distribution for the Rawreth Industrial Estate access is shown in Table 5.21.

<table>
<thead>
<tr>
<th>Primary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Our Lady of Ransom</td>
<td>3.0 km</td>
<td>8%</td>
</tr>
<tr>
<td>2. Down Hall</td>
<td>2.1 km</td>
<td>12%</td>
</tr>
<tr>
<td>3. Glebe Infant School</td>
<td>2.8 km</td>
<td>5%</td>
</tr>
<tr>
<td>4. Edward Francis</td>
<td>2.8 km</td>
<td>9%</td>
</tr>
<tr>
<td>5. Rayleigh Primary School</td>
<td>3.6 km</td>
<td>6%</td>
</tr>
<tr>
<td>6. St Nicholas C of E</td>
<td>0.6 km</td>
<td>59%</td>
</tr>
</tbody>
</table>

Table 5.21: Distribution of Primary School Trips for Rawreth Industrial Estate

### Secondary School

5.59 For Secondary Schools, distribution is related to a gravity function, taking into account the distance from the site and the size of the school. The distance of the schools and the distribution to each school is shown in Table 5.22. Secondary Schools are shown in Blue in Figure 5.3, and are numbered 1 and 2.

<table>
<thead>
<tr>
<th>Secondary School Details</th>
<th>Distance from Site Access</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Swayne Park School</td>
<td>3.3 km</td>
<td>45%</td>
</tr>
<tr>
<td>2. Fitzwimarc School</td>
<td>3.2 km</td>
<td>55%</td>
</tr>
</tbody>
</table>

Table 5.22: Distribution of Secondary School Trips for Rawreth Industrial Estate

### Other Trips

5.60 These trips have been distributed between North London (25% of trips), Central London (25%), Chelmsford (25%) and Rayleigh Town Centre (25%).
Figure 5.3: Study Area Amenities Plan with places of Education, Shopping and Leisure

5.61 Appendix C contains a full copy of the spreadsheet model.
6 Traffic Impacts

6.1 The Traffic Implications of the proposed development are considered in detail in the report, Trip Assessment and Junction Assessment which forms Appendix B of this Transport Assessment.

6.2 In addition a detailed assessment of the Operation of London Road has been undertaken, identifying causes of queuing and potential mitigation measures.

6.3 This section looks at the traffic impacts, using the trip assessment and distribution set out in Section 5.

Junctions Assessments

6.4 Further to discussions with ECC, the Local Highway Authority, capacity assessments have been undertaken at the junctions shown in Table 6.1 below. It is noted that the proposed access onto the Rawreth Lane Industrial Estate is not included, as it is anticipated that this junction will have low vehicle movements, as the majority of vehicles will use Rawreth Lane and London Road junctions to access the site.

6.5 In addition as stated above a detailed assessment of the operation of London Road has been undertaken.

<table>
<thead>
<tr>
<th>Junction</th>
<th>Type of Junction</th>
<th>Distribution</th>
<th>Reason for Model Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chelmsford Rd / London Rd</td>
<td>Roundabout</td>
<td>JUNCTIONS8 (ARCADY)</td>
<td>Roundabout junctions are modelled using ARCADY</td>
</tr>
<tr>
<td>Rawreth Lane / Industrial Access</td>
<td>Priority junction</td>
<td>JUNCTIONS8 (ARCADY)</td>
<td>Roundabout junctions are modelled using ARCADY</td>
</tr>
<tr>
<td>Hullbridge Rd / Rawreth Lane</td>
<td>Mini-roundabout</td>
<td>PARAMICS microsimulation</td>
<td>Mini-roundabouts can be understood further in a PARAMICS model, which takes better account of GAP acceptance etc. on queuing</td>
</tr>
<tr>
<td>Chelmsford Rd / Rawreth Lane</td>
<td>Signalised junction</td>
<td>LINSIG v3</td>
<td>Signalised junctions are modelled with LINSIG</td>
</tr>
<tr>
<td>London Rd proposed access</td>
<td>Priority junction</td>
<td>JUNCTIONS8 (PICADY)</td>
<td>Priority junctions are modelled using PICADY</td>
</tr>
<tr>
<td>Rawreth Lane proposed access</td>
<td>Priority junction</td>
<td>JUNCTIONS8 (PICADY)</td>
<td>Priority junctions are modelled using PICADY</td>
</tr>
</tbody>
</table>

Table 6.1: Junctions Subject to Assessment
6.6 These Junctions have been tested for both the Countryside Properties proposals, together with proposed development allocated in the Rochford District Council Local Plan, which is listed below.

- Test 1 - 500 + 20 units (520) for West of Rayleigh
- Test 2 - The total developable area within the SER1 allocation including the Application Site (550 dwellings, plus 10% for sensitivity testing purposes = 605)
- Test 3 - SER 1 with 10% sensitivity (605 dwellings) + Hullbridge (500 dwellings)
- Test 4 - SER 1 with 10% sensitivity (605 dwellings) + Hullbridge (500 dwellings) + Rawreth Industrial Estate (220 dwellings)

6.7 Test 4 clearly represents a worse case assessment of development coming forward within Rayleigh.

6.8 As stated the detailed model assessments are contained in Appendix B, with the models contained in Appendix D.

6.9 It should be noted that, whilst the proposals include for a primary school site, the traffic analysis does not take this into account and distributes trips among the existing primary schools in the area, making this a rigorous assessment as dispersal of vehicular trips associated with the morning and afternoon school runs from the proposed development will have a greater impact on the surrounding road network than would be the case if a primary school was included as part of the proposed development.

6.10 Detailed analysis of the results for each of the junctions tested in set out in Appendix B to this report. All the junction tests include for examining the Base and Base with growth together with the development tests outlined in paragraph 6.6.

Chelmsford Rd / London Rd roundabout junction

6.11 The model results show that the junction operates below capacity in all tests in the AM peak. The results show for the PM that the junction is reaching capacity and slightly exceeds capacity with the introduction of West of Rayleigh (Test 1). The primary cause of queuing observed in the PM peak at this junction is as a result of eastbound queuing on the London Road.

6.12 This junction was tested using PARAMICS, to provide a more considered understanding of the operation of the junction with specifically the operation of 2 lanes being in use for south to north traffic movements.

6.13 The more detailed analysis using the PARAMICS model shows the impact of West of Rayleigh (Test 1) development on the roundabout junction is negligible in the AM peak.
In addition in the PM peak, the PARAMICS model shows that the greatest maximum change in queues on the Western Arm of the Roundabout.

6.14 The analysis of the operation of London Road has shown queuing does block back to this junction during the PM Peak. The measures to alleviate queuing on London Road are discussed below and in Appendix E, and it is considered that these, would provide a beneficial effect to the operation of this roundabout.

**Rawreth Lane / Industrial Access Priority Junction**

6.15 The assessment shows that the junction would operate below capacity in all Tests in both the AM and PM peaks.

**Rawreth Lane / Hullbridge Road Mini Roundabout**

6.16 The junction has been modelled using PARAMICS microsimulation.

6.17 The PARAMICS results shows that the impact of the proposed West of Rayleigh development (Test 1) on the mini-roundabout junction in both peaks is minimal, due to only 7 vehicles generated for this junction at the AM peak, and 9 in the PM peak.

6.18 The cumulative assessment with the Hullbridge development (Test 3) does show a worsening in the operation of this roundabout.

6.19 ECC are developing both interim improvements and a scheme involving the creation of a larger roundabout at this junction. Subject to overall S106 discussions it is proposed to make a proportional contribution towards the implementation of these improvements, which is discussed in Section 7 for which ECC have been developing options for improving this junction.

**Chelmsford Rd / Rawreth Lane signalised junction**

6.20 The operation of the junction has been tested using LINSIG modelling software. The results of the model show that the junction operates below capacity in both peaks for all Tests.

6.21 On-site observations indicate queuing on Rawreth Lane can lead to delays for traffic seeking to make the right turn towards Rawreth Village. This is likely to be alleviated by the improvements to the Rawreth Lane/Hullbridge Road junction listed above. In the interim, the provision of enforcement signals at the junction is likely to provide additional gaps in the traffic for vehicles making the movement towards Rawreth Village, and consequently, subject to overall S106 discussions, Countryside Properties would make a proportional contribution towards improvements at this junction.
Site Access/Rawreth Lane

6.22 The results demonstrate the junction to be operating below capacity in both peak periods in all Tests.

Site Access/London Road

6.23 Whilst the PICADY model does show delays for right turners from the site in the PM peak, it is most probable that those movements would make a left turn onto Rawreth Lane in that period. The junction is shown to operate below capacity in both peaks, in all Tests.

Conclusions to the Capacity Assessments

6.24 The Capacity Assessments, indicate that outside of the Rawreth Lane/Hullbridge Road mini roundabout, there are only minor changes to the operation of the junctions tested with the proposed development and the major causes of congestion observed relate to queuing on London Road and queuing as stated at the Rawreth Lane/Hullbridge Road mini roundabout.

The London Road Corridor

6.25 The section of road considered stretches from the A1245 Chelmsford Rd roundabout (at the west) along London Rd to Station Rd (in the east), and includes all junctions and constraints along it.

6.26 The corridor includes many priority junctions, accesses to schools, bus stops, a signalised junction and signalised pedestrian crossings.

6.27 Our understanding of the operation of this corridor has been informed by;

- Detailed Site Visits
- Video Analysis
- Discussion with the Local Planning and Highway Authority
- Discussions with Local Residents and Users of the Corridor at the Pre-Application Public Meetings

6.28 Further to the detailed site visits, video surveys have been undertaken at a number of locations along the corridor, which are illustrated in Figure 6.1.
Figure 6.1: Camera locations

6.29 The videos were set up to record on Wednesday 5\textsuperscript{th} March 2014, from 07:00-10:00 and 16:00-19:00.

6.30 Screenshots from the videos are presented for the following figures:

- **Figure 6.2**: Camera 1. London Hill / Station Hill
- **Figure 6.3**: Camera 2. Down Hall Rd / London Rd
- **Figure 6.4**: Camera 3. Langdon Rd / London Rd
- **Figure 6.5**: Camera 4. Victoria Av / London Rd
- **Figure 6.6**: Camera 5. Little Wheatley Chase – London Rd
- **Figure 6.7**: Camera 6. London Rd (west) eastbound
- **Figure 6.8**: Camera 7. London Rd (west) westbound
Figure 6.2: Camera 1. London Hill / Station Hill

Figure 6.3: Camera 2. Down Hall Rd / London Rd
Figure 6.4: Camera 3. Langdon Rd / London Rd

Figure 6.5: Camera 4. Victoria Av / London Rd
Figure 6.6: Camera 5. Little Wheatley Chase – London Rd

Figure 6.7: Camera 6. London Rd (west) eastbound
6.31 From all examinations and discussions a number of observations can be drawn:

i) Queuing predominantly occurs on London Rd during the PM period, not during the AM period.

ii) The queuing is eastbound as traffic attempts to travel towards Rayleigh

iii) Eastbound queuing appears to originate from the London Hill / Station Rd priority junction (a sharp bend under a bridge) - camera 1

iv) In close proximity to this is the Down Hall Rd / London Rd priority junction that has issues of queuing on north, south and east arms – camera 2

v) This priority junction has pedestrian movements and is shown to operate over capacity, exacerbating any queuing along London Rd

vi) There are a number of priority junctions all along London Rd, where the presence of right turning traffic exacerbates queuing and slow moving traffic – camera 3

vii) The London Road/Victoria Avenue signalised junction operates over capacity during part of the PM peak period – camera 4

viii) The queuing along London Rd ensured that the eastbound traffic was restrained, causing queuing from the signal junction

ix) There are further priority junctions along London Rd exacerbating queuing and slow moving traffic – camera 5
x) The high volume of eastbound traffic combined with queuing all along London Rd causes queuing up to the roundabout — camera 7

6.32 It is clear that there is a high volume of traffic along London Rd that is prevented from moving freely due to frictional effects (attempted right turn traffic) and a priority junction operating over capacity. These prevent the signalised junction from operating at its full capacity, causing queuing all along London Rd from west to east.

6.33 Consequently a series of mitigation measures for the London Road corridor have been identified, which are considered in Section 7.
7 Mitigation Measures

7.1 This section looks at the proposals which could be implemented to encourage trips to and from the site, to be made by sustainable means. We also demonstrate in this section, similar proposals which have been implemented in other locations, and the results of these measures.

7.2 The proposed measures to encourage sustainable travel include:

- Highways Mitigation
- Bus Service to serve the site
- Free Bus Travel
- Cycle Proposals
- Travel Packs for Residents
- Smarter Choices Campaign
- Travel Plan

Highways Mitigation

7.3 The highways mitigation consists of measures for:

- Rawreth Lane/Chelmsford Road junction
- Rawreth Lane/Hullbridge Road junction
- London Road Corridor

7.4 The different measures proposed for each is set out in the following paragraphs.

Rawreth Lane/Hullbridge Road junction

7.5 Whilst the on-site observations show that this junction is a cause of queuing along Rawreth Lane. The detailed junction analysis contained in the TA, demonstrates that the West of Rayleigh proposals will make a minor change to queuing at this junction.

7.6 ECC, the Local Highways Authority have advised that they have identified a) minor changes to the junction and b) more extensive improvements which would involve the creation of a larger roundabout at this junction.

7.7 Subject to overall S106 discussions, Countryside Properties would make a proportional contribution towards improvements at this junction.

Rawreth Lane/Chelmsford Road junction

7.8 On-site observations indicate queuing on Rawreth Lane can lead to delays for traffic seeking to make the right turn towards Rawreth Village. This is likely to be alleviated
by the improvements to the Rawreth Lane/Hullbridge Road junction listed above. In the interim, the provision of enforcement signals at the junction is likely to provide additional gaps in the traffic for vehicles making the movement towards Rawreth Village.

**London Road Corridor**

7.9 As discussed in Section 6, it is clear that there is queuing along the entirety of London Road, primarily in the pm peak period.

7.10 Whilst in accordance with NPPF, the resolution of existing traffic problems is not a requirement to facilitate development, we have identified measures that would improve the operation of the corridor in overall terms, for which the proposed development would make a proportional contribution towards their implementation consistent with the changes in traffic as result of the proposed development, either directly implementing certain measures pursuant to a S278 Agreement or through contributions to allow the measures to be implemented by the Highway Authority.

7.11 The potential mitigation measures are discussed in detail in Appendix E, and summarised in the following paragraphs. Full size plans are contained in Appendix F.

7.12 These potential mitigation measures are:

- Introducing a two lane merge for traffic exiting the Chelmsford Rd roundabout to London Rd eastbound (Appendix F)
- Amending the signalised junction at Victoria Av / London Rd
- Introducing ghost right hand turn lanes for eastbound traffic on London Rd (Appendix F)
- Signalising the Down Hall Rd / London Rd junction (Appendix F)
- Introducing box junction road markings at the London Hill / Station Hill priority junction (Appendix F)

7.13 Where an improvement is a major change to the form of the junction, this has been subject to detailed modelling, namely the signalisation of the Down Hall Rd/London Road Junction.

**Two lane merge at exit of Chelmsford Rd roundabout**

7.14 This mitigation measure is illustrated in Figure 7.1, with the inset number referring to the inset within Appendix F.
Figure 7.1: Two lane merge at exit of Chelmsford Rd roundabout

7.15 It is felt that this merge will enable more queued traffic along London Rd without impacting on the roundabout. When combined with other mitigation proposed along London Rd it is felt that there will be a benefit to queuing at the roundabout due to queuing along London Rd.

*Amending the signalised junction at Victoria Av / London Rd*

7.16 In the early part of the PM peak period queuing occurs for eastbound traffic from this junction. In the latter part of the PM Peak period queues further downstream for eastbound traffic effect its operation. Discussions are being held with ECC in relation to improving the operation of the signals at this junction. This is subject to overall S106 discussions.

*Introducing ghost right hand turn lanes for eastbound traffic on London Rd*

7.17 It is proposed that ghost right hand turns are incorporated at three new locations on London Rd to enable right turning traffic to queue without blocking eastbound traffic. This should ease the overall traffic flow for eastbound London Rd traffic.
These mitigation measures are illustrated in Figure 7.2, Figure 7.3 and Figure 7.4, with the inset number referring to the inset within Appendix F.

Figure 7.2: Ghost island right turn at Louis Drive West
Figure 7.3: Ghost island right turn at Grange Gardens

Figure 7.4: Ghost island right turn at Talbot Avenue
Signalising the Down Hall Rd / London Rd junction

7.19 As discussed in Section 6, this priority junction currently operates over capacity with no control of the pedestrian signals and movements of heavily operating arms.

7.20 By signalising this junction pedestrians can cross in line with operating stages, and stages in general can operate to maintain a more free-flowing situation at this junction.

7.21 This mitigation measure is illustrated in Figure 7.5, with the inset number (number 6) referring to the inset within Appendix F.

Figure 7.5: Signalising the Down Hall Rd / London Rd junction
7.22 A LINSIG model has been built for the proposed layout, and flows for various flow scenarios have been incorporated. These scenarios are:

- P01 - Base (2013)
- P02 - Base (2015)
- P03 - Base (2015) + West of Rayleigh (520 units)
- P04 - Base (2015) + SER1 sensitivity (605 units)
- P05 - Base (2015) + SER1 sensitivity (605 units) + Hullbridge (500 units)
- P06 - Base (2015) + SER1 sensitivity (605 units) + Hullbridge (500 units) + Industrial Estate (220 units)

7.23 The flows used to comprise these scenarios are discussed in the "2014-05-14 - Trip Assessment and junction assessment" note.

7.24 The results of the LINSIG model, which are contained in Appendix E, demonstrate the junction would operate with considerably less queuing than currently occurs for all tests.

*Introducing box junction road markings at the London Hill / Station Hill priority junction*

7.25 It is proposed that box junction linings are introduced at the junction to ensure that no northbound traffic blocks southbound traffic.

7.26 This mitigation measure is illustrated in Figure 7.5, with the inset number (number 7) referring to the inset within Appendix F.

7.27 As stated in paragraph 7.10, the measures identified in this Section would provide an overall benefit to the operation of the London Road corridor above and beyond the extent of works, which is a requirement of proposed development to facilitate, having regard to the requirements of NPPF. Therefore subject to further to detailed examination to be undertaken by Essex County Council, the Local Highway Authority, it is proposed that either Countryside Properties would either implement certain measures pursuant to a S278 Agreement, subject to an assessment of proposed development impact and overall discussions regarding S106 contributions, or make a proportional contribution, with the remaining measures implemented through S106 contributions from other developments coming forward, together with other Local Highways Monies that are available.

**Bus Service**

7.28 To encourage the use of bus services, it is proposed that a new or diverted bus service will be introduced through the site, which will provide access to Rayleigh town centre and railway station.
7.29 The master planning of the site has been designed so that a bus could loop through the site. This is demonstrated in Figure 7.6.

**Figure 7.6: Proposed Bus Service**

**Free Bus Travel**

7.30 To encourage the use of bus travel, along with the proposals to provide a new or extended bus service, it is proposed to provide all residents with up to 1 year of free bus travel. This will be based on up to 4 bus tickets per household.

7.31 The details of the free bus travel will be contained within the Travel Packs which will allow people to apply for a free season ticket. This will encourage residents to travel by bus from the outset. Once the one year is over, a culture of travel by bus will have been established.
This has been provided at a number of schemes that we have worked on, which has proven to encourage residents to travel by bus, initially, and after the free travel period has finished.

As an example of this, implemented by the Author of this report, is at Beaulieu Park in Chelmsford. Here a new service was introduced into the development with residents receiving initial travel incentives and marketing information, as shown below in Figure 7.7

![Image of Beaulieu Park](image)

**Figure 7.7: The Bus Service Introduced at Beaulieu Park**

Over 50% of residents took up the initial free travel by bus. First Group (the local bus company) gave testimony to the success of the proposals in increasing bus use;

"...you will see that the number of people travelling by bus has increased by 24% between April 2003 to November 2003 compared with the same period in 2002. This is an exceptionally good performance and clearly demonstrate the benefits of developers and operators working together in partnership to encourage residents to use public transport, especially where levels of good quality service are available, as have been supplied by First in Beaulieu Park, and also through the provision of good quality information, as provided by yourselves to residents."

The service now operates on a commercial basis. Latest figures obtained from the bus company indicates on a typical week that there are over 1000 bus trips from within the development and that over 100 residents from a community of 550 units hold bus season tickets.
Further to this, at a scheme in Wimbledon, residents were offered a free £90 Oyster Card, which can be used on the local bus service. Over 50% of residents took up the free Oyster Card, and following our monitoring surveys, 25% of people use bus as their main mode of travel.

**Pedestrian Improvements**

As set out in Section 3, the masterplan includes for links to the east of the proposed development, which link to the Rawreth Lane Industrial Estate access road.

To encourage walking, and to assist walking to the St Nicolas Primary School, we have undertaken analysis of the existing route from the eastern edge of the proposed development to the St Nicolas Primary School, via a public footpath. The existing route is shown in **Figure 7.8**, along with photographs of different parts of the route. This improvement would be proposed to be implemented only if a Primary School did not come forward on the proposed development.

![Figure 7.8: Existing Route from the Eastern Edge of the Site to St Nicolas Primary School](image)

From the on-site analysis, a number of proposals could be provided to improve the walk route from the site to the primary school. These include:

- Footway on the western edge of the Industrial Estate access road
- Crossing on the access road
- Intermittent railing along the eastern side of the access road
- Raised crossing point at an industrial unit access
- Improved footway signage
- Improved lighting along the public footway
- Gate into the school playing field to provide access to the school

7.40 This is demonstrated in Figure 7.9.

![Image: Proposed Improvements to the Route](image)

Figure 7.9: Proposed Improvements to the Route

7.41 The proposals would provide a safe secure access route to the primary school to encourage residents to walk to school.

The Cycle Proposals

7.42 Cycling offers considerable scope to be a major form of travel both within the proposed development and for local trips. Along with proposals to create and improve cycle routes to and from the site (see point (ii) below), the Masterplan includes cycle connections throughout the site to encourage cycling as a mode of travel from the outset. Other measures will also be implemented to encourage cycling, including:
- The setting up on an on-site cycle training scheme;
- The provision of cycle maps through the Travel Packs provided to residents
- The provision of cycle storage, in line with local standards for residents

7.43 The ECC Parking Standards document (September 2009) states:
"1 secure covered space per dwelling. None if garage or secure area is provided within curtilage of dwelling"

7.44 In that context, is it proposed that cycle parking will be provided in accordance with the standard.

7.45 The above measures will help to create a culture of travel by bicycle from the outset.

**Travel Packs for Residents**

7.46 The provision of information is a key part of encouraging travel by non-car means and in accordance with best practice Travel Packs would be provided for residents of the proposed development, to encourage sustainable travel from the outset, as shown in **Figure 7.10**

![Figure 7.10: Indicative Travel Packs for Residents](image)

7.47 The content of the Travel Packs will be agreed with Kent County Council, and it is proposed that the following information will be included within the packs:

- Location map, showing the sites relation to the surrounding areas
- Public Transport (bus and rail) maps, showing routes and nearest bus stops/stations
- Site specific local public transport information (timetables), and how to obtain real-time information
- Website addresses for travel information, including Journey Planner’s
- Details of the cycle training, how much it costs and how residents can enrol
- Local cycle and walk routes, showing the types of routes available and local cycle shops
- Travel routes to the local schools
- Information on car sharing, such as how it works, and reasons to use it, local car sharing facilities, such as [www.essex.liftshare.com](http://www.essex.liftshare.com) and how residents enrol
- Maps and information, including addresses and telephone numbers of local amenities
- Information of Home Delivery Shopping Services available from supermarkets, including the web sites

**Smarter Choices**

7.48 The increase in population associated with the new developments in Rayleigh will inevitably be accompanied by an additional demand in travel, by means other than the car, for which providing additional highways capacity is not considered to be sustainable.

7.49 An alternative approach to manage the demand for travel to minimise journeys made and encourage travel by sustainable means. These measures have been shown to reduce the demand for travel and are often referred to under the banner of ‘Smarter Choices’.

7.50 Smarter Choices is a Department for Transport initiative to provide a framework of measures for promotion of more sustainable modes of travel. This involves a campaign, including area-wide personal travel planning, travel awareness campaigns, promotion of cycling and walking, public transport information and marketing, travel planning for workplaces and schools. The documented research of the effects of these measures shows that a campaign can generate a substantial shift of transport mode away from car driver trips.

7.51 The DfT have undertaken pilot studies in Worcester, Peterborough and Darlington, to encourage trips on foot, by cycle and by public transport. These initiatives have made considerable differences in terms of reducing background traffic, as shown below, indicating a 7%-8% reduction in traffic volumes.
The Results of the Dft Smarter Choices Programme

The Dft undertook measures in Worcester, Peterborough and Darlington to encourage trips to be made by more sustainable modes.

The Results through the introduction of the Measures were:

- Reduction in Car Journeys – 9%
- Reduction in Traffic Volumes – 7 to 8%
- Increase in Bus, Walking and Cycle Trips – 10% to 30%

7.52 With the various strategic sites coming forward in Rayleigh, the opportunity exists for all sites to provide a proportional contribution to the implementation of a Smarter Choices campaign in Rayleigh, to reduce traffic flows. This would be secured through the Section 106 Agreement.

Travel Plan

7.53 A bespoke comprehensive Residential Travel Plan will be provided as part of the proposed development. This will include the details of:

- The aims and objectives
- The proposed initial and final targets
- More detailed information on the measures proposed
- How the Travel Plan will be managed
- The monitoring and reporting proposals

7.54 A Draft Travel Plan is contained in Appendix G.

Conclusions to this section

It can be seen, that whilst the site is in a good location for the existing ability to make journeys by sustainable means, a package of measures will be provided including a new bus service when it is viable to do so, which will encourage new residents to travel by means other than the private car from the outset, along with marketing of sustainable methods of travel for all residents.
8 Conclusions

8.9 This Transport Assessment has been prepared on behalf of Countryside Properties, to support an application for up to 500 residential units and a Primary School, at West of Rayleigh, in Rayleigh, Essex, within the SER1 site which has been allocated for 550 residential units. For the purpose of the Transport Assessment a rigorous assessment of 520 units within the application boundary has been made.

8.10 The Transport Assessment has considered both how the proposed development would work on its own, but also how it would work with the other sites planned to come forward in Rayleigh, namely:
- Hullbridge (Up to 500 units)
- Rawreth Lane Industrial Estate (up to 220 units)

8.11 Following agreement with the Local Highway Authority, Essex County Council (ECC) a spreadsheet model has been prepared to assign the trips from the proposed development, but also to consider the cumulative impact of the other sites. Using this spreadsheet, six key junctions were identified for detailed analysis. The operation of the following junctions was assessed in detailed:
- Chelmsford Road/London Road
- Rawreth Lane/Industrial Access
- Hullbridge Road/Rawreth Lane
- Chelmsford Road/Rawreth Lane
- London Road Proposed Access
- Rawreth Lane Proposed Access

8.12 The analysis concluded that the proposed development would not lead to serious harm to the operation of any of the junctions, which is the relevant test as set out in NPPF. However, it is acknowledged that queueing occurs on London Road particularly in the pm peak and that queuing occurs at the Rawreth Lane/Hullbridge Road mini roundabout particularly in both peaks. Therefore the operation of the London Road and Rawreth Lane corridors has been considered in detail and mitigation measures have been developed and discussed with the local Highway Authority.

8.13 For the London Road, a series of measures have been developed which include for;
- Introducing a two lane merge for traffic exiting the Chelmsford Road roundabout to London Road eastbound
- Amending the signalised junction at Victoria Avenue / London Road
• Introducing ghost right hand turn lanes for eastbound traffic on London Road
• Signalising the Down Hall Road / London Road junction
• Introducing box junction road markings at the London Hill / Station Hill priority junction

8.14 These measures identified in this Section would provide an overall benefit to the operation of the London Road corridor above and beyond the extent of works, which is a requirement of proposed development to facilitate, having regard to the requirements of NPPF. Therefore subject to further to detailed examination to be undertaken by Essex County Council, the Local Highway Authority, it is proposed that either Countryside Properties would either implement certain measures pursuant to a S278 Agreement, subject to an assessment of development impact and overall discussions regarding S106 contributions, or make a proportional contribution, with the remaining measures implemented through S106 contributions from other developments coming forward, together with other Local Highways Monies that are available.

8.15 For Rawreth Lane, whilst the detailed analysis of the Rawreth Lane/Hullbridge Road junction has shown that the proposed development make a limited impact in terms of existing queuing, it is acknowledged that ECC are developing proposals to mitigate the operation of this junction and Countryside Properties would propose to make a proportional contribution towards the implementation of this improvement and the measures proposed to alleviate queuing on London Road, subject to overall S106 Discussions.

8.16 Encouraging as many trips as possible to be made by means other than the private car is a key part of the Transport Strategy for the proposed development and Countryside Properties would implement a series of measures to encourage trips to be made by means other than the private car, which include;
• Bus Service to serve the site
• Free Bus Travel
• Cycle Proposals
• Travel Packs for Residents
• Smarter Choices Campaign
• Travel Plan
• Improved Connections on Foot to the Local Schools