TRANSPORT ASSESSMENT

Land East of Holt Road, Horsford

David Wilson Homes (Eastern)

October 2016

Project no: 47172
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1. **INTRODUCTION**

1.1. Richard Jackson Ltd have been commissioned by David Wilson Homes (Eastern) to prepare a Transport Assessment (TA) in support of an application for full planning permission for a development of 259 dwellings on land east of Holt Road, Horsford, Norfolk. The site has a grid reference of 618900, 317350 and an approximate postcode of NR10 3ED. The site location is shown on **Figure 1**.

1.2. The site is bound by residential properties to the southwest, Green Lane to the north, agricultural fields to the east and the development of ‘Butterfly Mill’ to the south.

1.3. The site lies within the Broadland District Council area and Broadland District Council are the local planning authority for the development. The local highway authority is Norfolk County Council (NCC).

1.4. NCC have been consulted during the preparation of this TA, which included an upgrade to Green Lane between the site and the B1149 Holt Road as this would require widening to accommodate the proposals. A copy of the relevant scoping correspondence is included in **Appendix A**.

1.5. This TA will cover the following areas:

- A review of National and Local land-use/transport policy is undertaken in **Chapter 2**.

- **Chapter 3** describes the existing conditions including the surrounding highway network, the available facilities for public transport, cyclists and pedestrians and the range of local amenities.

- Local highway safety is considered at **Chapter 4** through a review of local highway accident records.

- The proposed development is described in **Chapter 5**.

- **Chapter 6** estimates the level of trip generation and distribution vehicular trips likely to be associated with the development.

- **Chapter 7** provides an assessment of the likely traffic impact and junction capacity assessment of the site development.

- The conclusions derived from the assessment are set out in **Chapter 8**.

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2. POLICY CONSIDERATION

National Policy

2.1. National Planning Policy reflects and responds to growing concern over environmental issues and a greater public awareness of the problems associated with unrestrained car use. Current policies place a greater emphasis on increasing accessibility by more sustainable modes, such as walking, cycling and public transport.

National Planning Policy Framework (NPPF)

2.2. NPPF provides advice on assessing transport, infrastructure and sustainability for new developments. The key aim of the NPPF is to ensure that local authorities carry out their land use policies and transport programmes in ways that help to:

- Promote more sustainable transport choices for people;
- Promote accessibility to jobs, shopping, leisure facilities and services by public transport; walking and cycling; and
- Reduce the need to travel, especially by car.

2.3. The document re-states the key themes of sustainable transport development that have emerged in recent years. It advises that major developments should be accompanied by a Transport Assessment or Transport Statement, which includes details of access by walking, cycling and public transport.

2.4. With regards to development the NPPF identifies walking is the most important mode of travel at the local level and that walking offers the greatest potential to replace short car trips. Furthermore, the document acknowledges that cycling also has the potential to substitute for short car trips and to form part of a longer journey by public transport. It also states that the likely availability and use of public transport is a very important aspect in determining local policies designed to reduce the need to travel by car. Establishing a high quality, safe and secure public transport network should, therefore, assist in maximising the potential uptake of public transport.

Joint Core Strategy (JCS) (March 2011, amended 2014)

2.5. The transport elements of the JCS (adopted March 2011 and amended in 2014) are aimed at promoting sustainable economic development, improving local quality of life, reducing the contribution to climate change, promoting healthy travel choices and minimising the need to use the private car for single occupancy trips. The JCS transport policy would be achieved in part by the implementation of the Norwich Area Transport Strategy (NATS). With regard to the development location, Horsford is identified as a Service Village in the Norwich Policy Area under Policy 15 of the JCS.
Local Transport Plan (LTP)

2.6. The LTP sets out the Local Highway Authority’s vision, strategy and policies for transport delivery up to 2026 and also describes the approach and measures that will be taken to implement these policies.

2.7. Key objectives in Norfolk include:

- Improving strategic accessibility into Norfolk and also access to key services;
- Reducing the need to travel and improving journey reliability, especially for public transport;
- Reducing the number and severity of congestion incidents and road traffic collisions;
- Improving local air quality and minimising the adverse impacts of transport provision on the built environment.

2.8. The LTP defines Sub Region and Area Transport Strategies that set the particular emphasis in those specific areas. The LTP has been adopted and has been considered in the development of the proposals and the impact assessment of transport related to generated trips.

Norwich Area Transportation Strategy (NATS)

2.9. The NATS prepared by NCC contains a more detailed analysis and promotes travel choice, recognising the need to maintain the economic health of the Norwich area and does not propose radical restrictions on vehicular access.

2.10. Key objectives include:

- Undertaking transport improvements that enhance and support the local economy together with building a Northern Distributor Road (NDR) and creating a Bus Rapid Transit (BRT) on key routes;
- Improving the pedestrian environment and also reducing the impact of traffic on residential streets;
- Implementing a programme of potential public transport improvements, including park and ride;
- Reducing the impact of poor air quality;
- Develop the Urban Traffic Control System to provide up-to-date real time information to assist congestion control;
- Junction improvements on the A47 Norwich Southern Bypass.
Broadland Local Plan

2.11 Local planning policy in Broadland is in the form of Development Plan Documents (DPDs) which set out the general and specific policies guiding development in the district. The DPDs form part of the emerging Local Plan and are the district’s primary consideration in determining planning applications.

2.12 The site lies immediately adjacent to allocated site PS36-02 and the existing settlement boundary for Horsford. Site PS36-02, is currently under construction by the same applicant, known as ‘Butterfly Mill’ with 125 dwellings on the 5.4Ha site due for completion in 2016 and for which planning application No.20130547 refers.

2.13 The Development Management DPD (adopted August 2015) includes a number of policies relevant to the proposals with respect to transport, these include:

- GC1 Presumption in favour of sustainable development
- TS2 Travel Plans and Transport Assessment
- TS3 Highway Safety
- TS4 Parking Guidelines

Compliance with Planning Policy

2.14 The development proposals considered herein will demonstrate the opportunities for sustainable travel to show the development is sustainable in transport terms in accordance with Policy GC1. The NPPF and Policy TS2 identify the need for this transport assessment to assess the potential impact of the development proposals. Part of this TA will review the highway safety implications of the development through a review of local highway injury accident data to demonstrate that the development will not have a significant impact on the safety of the highway network as required by Policy TS3. Levels of parking and turning facilities within the development will be reviewed in accordance with the requirements of Policy TS4.
3. **EXISTING SITUATION**

**Site Location & Existing Access**

3.1. The site is located on agricultural land to the east of Holt Road, Horsford. The approximate grid reference for the site is 618900, 317350 and an approximate postcode of NR10 3ED. The site is bound by Green Lane to the north, existing dwellings to the southwest and agricultural fields to the east. To the southeast is the “Butterfly Mill” development which is due to be completed by May 2017.

3.2. The site is approximately 1.25km to the north of the Village Hall on Holt Road and 10km north of Norwich City Centre. The main access to the site is from Green Lane which provides access to the B1149 Holt Road. Green Lane is a ‘no through route’ to vehicular traffic, however for non-vehicular users Mill Lane and the A140 can be reached to the east of the site.

**Pedestrian & Cycle Network**

3.3. There are presently no footways along Green Lane, however from the junction with the B1149 Holt Road a 1.8m wide footway is present on the northeast side of the road leading south from Green Lane towards the village centre and local facilities. The development would therefore provide a footway long Green Lane between the site and Holt Road, the details of which are included in Section 5.

3.4. Footways are also present within the ‘Butterfly Mill’ development on the sites southern boundary which would provide an alternative route for the completed development to the village centre via the primary school on Mill Lane. The route to the primary school from the site’s boundary to ‘Butterfly Mill’ is assessed as a safe route to school in Appendix B.

3.5. The existing footways extend through the village on the main and side roads. There are links through to the existing rural footpath network to the north and east at Horsford Woods for recreational use.

3.6. There are no dedicated cycle facilities within Horsford, however the village centre could be reached via the adjacent “Butterfly Mill” and Mill Lane which have lower traffic flows than the B1149.

**Public Transport**

3.7. The nearest bus stops to the site are on Holt Road at Sandy Lane (south/Norwich bound) and Pinelands Industrial Estate (north/Holt bound). These are approximately 1.2km from the site. Numerous bus services from First Buses & Sanders Coaches use these stops. These key services are summarised in Table 3.1 with timetable information included at Appendix C and the routes are shown on Figure 2.
### Table 3.1 – Bus Provisions

<table>
<thead>
<tr>
<th>Operator</th>
<th>Service</th>
<th>Typical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Buses (Norfolk &amp; Suffolk)</td>
<td>36 – Horsford – Norwich – Long Stratton</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;Daytime - 0633, 0653, 0724, 0752, 0832, 0902, 0932, 1006, then half hourly - 1536, 1607, 1637, 1713, 1748, 1815, 1844, 1916&lt;br&gt;Evening – <strong>36B</strong> - 2345</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Saturday</strong>&lt;br&gt;Daytime – Half hourly (0636 – 1736), 1804, 1834, 1906&lt;br&gt;Evening – <strong>36B</strong> - 2345</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sunday</strong>&lt;br&gt;Daytime – 0910, 1010&lt;br&gt;Evening – No service&lt;br&gt;<strong>36B</strong> - 2345</td>
</tr>
<tr>
<td></td>
<td>36 – Long Stratton-Norwich – Horsford</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;Daytime - 0746, 0912, Then half hourly (1002 – 1632), 1708, 1743, 1813, 1842, 1912&lt;br&gt;Evening – <strong>36B</strong> - 2343</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Saturdays</strong>&lt;br&gt;Daytime – Half Hourly (0832 – 1902)&lt;br&gt;Evening – <strong>36B</strong> - 2343</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sundays</strong>&lt;br&gt;Daytime – 1717, 1817&lt;br&gt;Evening – No service&lt;br&gt;<strong>36B</strong> - 2343</td>
</tr>
<tr>
<td>Sanders Coaches</td>
<td>42 Reepham/Holt - Norwich</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;0743, 0943, 1207</td>
</tr>
<tr>
<td>Sanders Coaches</td>
<td>42 Norwich – Reepham/Holt</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;1136, 1406, 1811</td>
</tr>
<tr>
<td>Sanders Coaches</td>
<td>45 Holt – Briston – Norwich</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;45: 0739, 1019 (not wed) 1148, 1458&lt;br&gt;45B: 1022 (only Wednesday)&lt;br&gt;<strong>Saturday</strong>&lt;br&gt;45: 1308, 1703&lt;br&gt;45B: 0937</td>
</tr>
<tr>
<td>Sanders Coaches</td>
<td>45A Holt – Felthorpe – Melton Constable – Holt</td>
<td></td>
</tr>
<tr>
<td>Sanders Coaches</td>
<td>45B Norwich – Haveringland – Corpusty – Holt</td>
<td><strong>Monday – Friday</strong>&lt;br&gt;45: 1031&lt;br&gt;45A: 1801&lt;br&gt;45B: 1401&lt;br&gt;45B: 1011, 1326 (not wed), 1756&lt;br&gt;45A: 1641&lt;br&gt;45B: 1326 (only wed)&lt;br&gt;<strong>Saturday</strong>&lt;br&gt;45: 1031&lt;br&gt;45A: 1801&lt;br&gt;45B: 1401</td>
</tr>
</tbody>
</table>

3.8. In addition the local services above, Norwich Airport Park & Ride is located approximately 6.3km to the south which can be used as part of a multimodal trip to Norwich City Centre.

3.9. Rail services can be found at Norwich train station which is located approximately 10.22km to the south of the site. The nearest bus services from Horsford stop approximately 0.75km away from the station at Tombland. At the station there are spaces for around 400 cycles and vehicular parking for 62 spaces with 5 accessible space also available. Nearby is the Riverside Retail complex multi storey which 740 spaces with
52 accessible; a rail user tariff is available on a limited number of these spaces. A further 385 cap parking spaces are available at Lower Clarence Road. The station offers step free access across all platforms.

3.10. The train station has many mainline services including to London Liverpool Street (every 30 mins), Liverpool Lime Street (hourly). There are also frequent services to Cambridge, Great Yarmouth (via Acle or Cantley), Lowestoft and Sheringham.

3.11. In addition to the above public transport provision school transport services are available to Hellesdon High School.

**Highway Network**

3.12. Within the vicinity of the site, Green Lane is approximately 2.9m in width and leads to the B1149 Holt Road to the west. Green Lane is presently subject to the national speed limit (60mph).

3.13. The access to the wider network is via the Green Lane junction with Holt Road which is approximately 6.1m – 6.6m wide width. The junction and the B1149 to the south are subject to a 40mph speed limit with the national speed limit in force to the north and on Haveringland Road, opposite.

3.14. The B1149 to the north provides access to Holt, (and for access to Sheringham and Cromer) and to the south for Norwich, the A47 to the east of Norwich and the (under construction) Norwich Northern Distributor Road (NDR). Access for the A47 and the route to the A11 to the west and south is via Haveringland Road and Felthorpe.

**Existing Local Amenities**

3.15. NPPF identifies walking as the most important form of travel at a local level and that walking offers the greater potential to replace the car for journeys of less than 2km. The document also acknowledges that cycling has the potential to replace many car trips of less than 5.0km, which may also form part of longer journeys supported by public transport.

3.16. There are a number of local facilities/amenities that already exist near to the site and these are listed below:
Table 3.3 - Local Amenities/Services

<table>
<thead>
<tr>
<th>Amenity</th>
<th>Description</th>
<th>Location</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Stops</td>
<td>Sandy Lane/Pinelands Industrial Estate</td>
<td>Horsford</td>
<td>1.2</td>
</tr>
<tr>
<td>Primary School</td>
<td>Horsford C of E Junior School</td>
<td>Horsford</td>
<td>0.8</td>
</tr>
<tr>
<td>Public House</td>
<td>The Brickmakers</td>
<td>Horsford</td>
<td>1.2</td>
</tr>
<tr>
<td>Doctor</td>
<td>Horsford Medical Centre</td>
<td>Horsford</td>
<td>1.1</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Pledger Pharmacy</td>
<td>Horsford</td>
<td>1.1</td>
</tr>
<tr>
<td>Local Employment</td>
<td>Pinelands Industrial Estate</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Place of Worship</td>
<td>Horsford Methodist Church</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Children’s Centre</td>
<td>Hellesdon Area Children’s Centre</td>
<td>Horsford</td>
<td>1.6</td>
</tr>
<tr>
<td>Village Hall</td>
<td>Horsford Village Hall</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Post Office</td>
<td>Inside Co-op Foodstore</td>
<td>Horsford</td>
<td>1.7</td>
</tr>
<tr>
<td>Local Shop</td>
<td>Co-op Foodstore</td>
<td>Horsford</td>
<td>1.7</td>
</tr>
<tr>
<td>Recreation Ground</td>
<td>(Village Hall) Playing Fields</td>
<td>Horsford</td>
<td>1.6</td>
</tr>
<tr>
<td>Local Employment</td>
<td>Horsebeck Industrial Estate</td>
<td>Horsford</td>
<td>2.3</td>
</tr>
<tr>
<td>Employment</td>
<td>Norwich Airport Ind Est</td>
<td>Norwich</td>
<td>5.5</td>
</tr>
<tr>
<td>Secondary School</td>
<td>Hellesdon High School</td>
<td>Hellesdon</td>
<td>7.4</td>
</tr>
<tr>
<td>Employment</td>
<td>Norwich City Centre</td>
<td>Norwich</td>
<td>10.0</td>
</tr>
<tr>
<td>Rail Station</td>
<td>Norwich</td>
<td>Norwich</td>
<td>11.0</td>
</tr>
</tbody>
</table>

Note: Distances shown are from the centre of the site via most direct route.

3.17. Accessibility to local services is very important in respect to transport planning. The above table provides an indication of the distances that need to be travelled to facilities and as a consequence, the following list indicates the acceptability of the site in terms of distance, frequency of use and acceptability of need to travel.

Table 3.4 - Acceptability of Travel/Use Table

<table>
<thead>
<tr>
<th>Location</th>
<th>Km</th>
<th>Likely Frequency of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daily Km</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;5.0</td>
</tr>
<tr>
<td>Bus Stops</td>
<td>Horsford</td>
<td>1.2</td>
</tr>
<tr>
<td>Primary School</td>
<td>Horsford</td>
<td>0.8</td>
</tr>
<tr>
<td>Public House</td>
<td>Horsford</td>
<td>1.2</td>
</tr>
<tr>
<td>Doctor</td>
<td>Horsford</td>
<td>1.1</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Horsford</td>
<td>1.1</td>
</tr>
<tr>
<td>Local Employment</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Place of Worship</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Children’s Centre</td>
<td>Horsford</td>
<td>1.6</td>
</tr>
<tr>
<td>Village Hall</td>
<td>Horsford</td>
<td>1.5</td>
</tr>
<tr>
<td>Post Office</td>
<td>Horsford</td>
<td>1.7</td>
</tr>
<tr>
<td>Local Shop</td>
<td>Horsford</td>
<td>1.7</td>
</tr>
<tr>
<td>Recreation Ground</td>
<td>Horsford</td>
<td>1.6</td>
</tr>
<tr>
<td>Local Employment</td>
<td>Horsford</td>
<td>2.3</td>
</tr>
<tr>
<td>Employment</td>
<td>Norwich Airport Ind Est</td>
<td>5.5</td>
</tr>
<tr>
<td>Secondary School</td>
<td>Hellesdon</td>
<td>7.4</td>
</tr>
<tr>
<td>Employment</td>
<td>Norwich</td>
<td>10.0</td>
</tr>
<tr>
<td>Rail Station</td>
<td>Norwich</td>
<td>11.0</td>
</tr>
</tbody>
</table>
3.18. The conclusions of the acceptability table for distance and frequency of use indicates that most activities are within 5.0km of the site. Whilst the secondary school is greater than 5.0km, there is a school bus service for children to use. All other facilities that might be required on a daily basis are within 2.0km, except the railway station and further employment uses, which can be reached via public transport.

Traffic Data Review

3.19. In order to consider the existing traffic conditions on the local highway network, traffic data for the B1149 was collected by Consequential Surveys at locations agreed with NCC (noted in Appendix A). Junction data was collected for the B1149 junctions with Green Lane and Mill Lane on Tuesday 7 June 2016 for the periods 0700 -1000 and 1600 -1900. A copy of the traffic survey information is included in Appendix D and is summarised diagrammatically in Passenger Car Units (PCUs) on Traffic Flow Diagrams 1 and 2 in Appendix E.

3.20. The junction count data was supplemented by a one week automatic traffic count (ATC) placed to the south of Green Lane. The data included speed and volume information and a copy of this is included in Appendix D. The recorded 85th percentile speeds were 47.8mph northbound and 48.0mph southbound. The ATC data also validated the junction count of the B1149/Green Lane for flows to/from the south of the junction.

Compliance with Planning Policy

3.21. There are a number of opportunities for travel to local amenities/services on foot. The route to the nearest primary school includes no major road crossings. For amenities outside of Horsford there are a number of bus services available from Holt Road.

3.22. Subject to a suitable highway access strategy including pedestrian/cycle connectivity to ‘Butterfly Mill’ and improvements to Green Lane between the site and Holt Road, the site can be considered to be in a sustainable location in terms of Transport.
4. HIGHWAY SAFETY

4.1. A review of local highway injury accident data has been undertaken with data obtained from NCC. The study area includes Green Lane between the site and the B1149 Holt Road and the B1149 Holt Road from Green Lane to the junction with Mill Lane to the south. Green Lane between the B1149 and the site and Mill Lane from the B1149 to ‘Butterfly Mill’ are also included. The data included in Appendix F covers the three year period from 1st May 2013 – 30th April 2016.

4.2. Within the study area there were 3 reported accidents with 4 injuries recorded of which one injury was classified as ‘serious’ with the remainder classified as ‘slight’. There were no fatal accidents reported. There were no accidents involving pedestrians and none during the hours of darkness.

4.3. The ‘serious’ accident occurred when a vehicle had stopped at the pedestrian crossing just south of the Mill Lane junction. A second vehicle failed to stop in time causing a rear end shunt of the first vehicle.

4.4. The remaining two accidents resulted in ‘slight’ injuries and both occurred with traffic flowing northbound. The accident reference NCT130233 involved a vehicle waiting to turn right into Mill Lane when a rear end shunt occurred.

4.5. The final accident involved three vehicles and resulted in two ‘slight’ injuries. Two cars were held up close to the junction travelling in a northbound direction when a third vehicle collided with the rear or the vehicle in front.

Compliance with Planning Policy

4.6. The proposed development is unlikely to significantly change the accident rate at the Mill Lane junction. Residents from the proposed development are however, likely to use the zebra crossing to reach some of the local facilities identified in Section 3. The developer would therefore support an additional area of high friction surfacing on the north bound carriageway of Holt Road between the zebra crossing and Mill Lane if requested by the highway authority. Should any improvements to the road signage be identified by the highway authority these would also be supported by the developer.

4.7. The development would therefore not result in significant impact upon the satisfactory functioning or safety of the highway network in accordance with Policy TS3.
5. PROPOSED DEVELOPMENT

5.1. The proposed development will comprise of 259 dwellings on the site as illustrated on the Site Layout included in Appendix G.

Access

5.2. The development will take its primary access from Green Lane to the northern boundary of the site with a Type 2 road (as defined by the Norfolk Residential Design Guide) leading into the site though a change of priority junction as shown on Drawing 47172-PP-005. Between the site and the B1149 Holt Road, Green Lane will be improved to 6.0m in width with a 2.0m wide footway on the southern side (generally consistent with a Type 2 road). The junction of Green Lane and the B1149 Holt Road will also be improved to provide a right/left stagger with Haveringland Road. The junction improvement is shown on Drawing 47172-PP-008.

5.3. In addition to the vehicular access, a connection will be made through to the adjacent ‘Butterfly Mill’ development for pedestrians, cyclists, buses and emergency vehicles as illustrated on Drawing 47172-PP-011. Features such as CCTV and/or bollards would be included to restrict general vehicular use.

Parking and Manoeuvring

5.4. The requirement for car parking is set out in the ‘Parking Standards for Norfolk 2007’, where 1 space would be provided for 1 bed dwellings, 2 spaces would typically be provided for 2 or 3 bed dwellings, and 3 spaces would be anticipated where 4 or more bed dwellings are provided. A provision for visitor parking has also been made for the 1 bed dwellings at a rate of 1.5 spaces per dwelling. It is anticipated that cycle parking for housing association units would be accommodated in secure areas within the curtilage of each dwelling or be otherwise provided as required by the planning authority.

5.5. Turning bays will be predominately of Type 3 size with Type 5 used where appropriate in accordance with the Norfolk Residential Design Guide to aid vehicle manoeuvring.

Public Transport

5.6. The operator of bus service 36, First, which currently terminates at a loop at Barrett-Lennard Road/Olive Crescent, some 500m to the south of Green Lane has been contacted regarding the potential for future bus services for the development and a copy of the correspondence is included in Appendix H. The operator would consider serving the proposed development and the adjacent ‘Butterfly Mill’ development with a bus gate feature between them or just the proposed development only with a bus terminus loop.

5.7. The realigned B1149 Holt Road/Green Lane junction will provide a route into the development suitable for busses. Within the proposed development and the adjacent ‘Butterfly Mill’ the route for buses would be 6.0m wide complying with the minimum requirements of NCC. The location of bus stops along the route and the specification of the proposed bus gate facility...
(illustrated on **Drawing 47172-PP-011**) would be considered further at the detailed design stage.

**Compliance with Planning Policy**

5.8. The developments accessibility has been developed with regard the Norfolk Residential Design Guide and supplementary guidance from officers of NCC dated 28 June 2016 (a copy of which is included at **Appendix A**) as far as is practicable.

5.9. The development will provide vehicular parking based upon the ‘Parking Standards for Norfolk 2007’ and manoeuvring space in accordance with the Norfolk Residential Design Guide to ensure that the development complies with the Local Development Management DPD Policy TS4. To comply with Policy TS3 the access to Green Lane/Holt Road will be subject to the Road Safety Audit process in due course. The pedestrian/cycle connectivity and bus permeation also comply with Policy GC1 as they maximise access by sustainable modes of travel.
6. **TRIP GENERATION AND DISTRIBUTION**

6.1. In order to assess the future impact of the development proposals on the local highway network, it is necessary to apply traffic growth to the traffic survey data described in Chapter 3. This section considers the ‘base’ traffic position and details the trip generation and distribution of traffic for the proposed development.

**Background Traffic Growth**

6.2. Background traffic growth factors were included in the scoping correspondence with NCC. These have been calculated from data contained in TEMPro computer programme using data sets NTEM62 and NTM AF09. The calculation has been made for Horsford with road type rural principle and is summarised in Table 6.1. A copy of the outputs from TEMPro included in the scoping correspondence can be found in Appendix A.

Table 6.1 – Traffic Growth Factors

<table>
<thead>
<tr>
<th>Weekday AM</th>
<th>Weekday PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 – 2021</td>
<td>1.0999</td>
</tr>
</tbody>
</table>

6.3. Following the completion of the scooping study, an update to the TEMPro data has been released with the applicable data sets now NTEM70 and NTM AF15. The zoning structure of the data is different from that used in the scoping study and Horsford is now part of zone Broadland 004. The growth factors have been recalculated using this data and found to be lower than those included in the scoping study. The growth factors in Table 6.1 have therefore been retained for this TA for robustness.

6.4. The traffic growth factors have been applied to the 2016 survey data to provide a baseline for comparison to the addition of development traffic. The resulting traffic flows are shown diagrammatically on Traffic Flow Diagrams 3 and 4 in Appendix E.

**Committed Development**

6.5. The ‘Butterfly Mill’ development at Mill Lane was not yet complete at the time of the traffic surveys. For the purpose of this assessment 62 dwellings (approximately 50%) have been considered to be complete at the time of the surveys. A further 63 dwellings have therefore been considered as committed development with trip rates and distribution taken as for the proposed development described below and assigned to the local land network accordingly. Although the development is still under construction, no reductions have been made for construction traffic trips to/from the development which are expected to cease before May 2017 and traffic growth has been applied to observed flows using the B1149/Mill Lane junction, in the interests of a robust assessment.

**Proposed Development Trip Generation**

6.6. As the ‘Butterfly Mill’ development was not complete at the time of the traffic surveys and construction traffic is still present, it was not possible to obtain an accurate, location specific observed trip generation. The TRICS based trip rates from the ‘Butterfly Mill’ developments TA have therefore
been applied to the current proposals as these were accepted previously. The vehicular trip rates and corresponding trips are illustrated in Table 6.2.

Table 6.2 – Vehicular Trip Generation

<table>
<thead>
<tr>
<th>Vehicular Trip Rates &amp; Trips</th>
<th>AM Peak</th>
<th>PM Peak</th>
<th>12 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arrivals</td>
<td>Departures</td>
<td>Arrivals</td>
</tr>
<tr>
<td>Private Housing Trip Rate (1 Dwelling)</td>
<td>0.163</td>
<td>0.435</td>
<td>0.409</td>
</tr>
<tr>
<td>Private Housing Trips (259 dwellings)</td>
<td>42</td>
<td>113</td>
<td>106</td>
</tr>
</tbody>
</table>

6.7. The trip generations above considers private houses only. The development would include an element of affordable dwellings which typically have lower peak hour vehicular trip generations. In addition a Travel Plan (TP) would be required for a development of this size (secured by a planning condition/obligation) which would seek to reduce the mode share for trips by private car, particularly those of single occupancy. This would be achieved through reducing the need to travel and increasing the attractiveness of using other modes of transport by providing better information to residents and including incentives such as free bus travel for an introductory period. No reductions have been made to the vehicular trip generation for the successful implementation of the TP in this assessment. The trip rates and generations are therefore considered to be robust for the assessment of highway capacity included in Chapter 7.

6.8. The development would generate predominately passenger car based trips with only occasional servicing vehicles. A vehicle to PCU factor of 1 has therefore been applied to the trip generation figures above in the traffic modelling.

6.9. An estimate of mode split can be derived from the 2011 Census, Method of Travel to Work data. Table 6.3 shows the mode split for the combined Lower Super Output Areas, Broadland 04C, 04D and 04E, which cover Horsford. The table also shows the anticipated number of trips by mode for the weekday peak hours where the majority of trips are likely to be journeys to work, the same journey purpose as the mode split data. The trip estimates are based on the number of vehicle trips from Table 6.2.
Table 6.3 – 2011 Census Journey to Work Mode Split and Trip

<table>
<thead>
<tr>
<th>Mode Split % of those who travel</th>
<th>AM Peak Trips</th>
<th>PM Peak Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Bus</td>
<td>8%</td>
<td>15</td>
</tr>
<tr>
<td>Taxi</td>
<td>0%</td>
<td>15</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>1%</td>
<td>155</td>
</tr>
<tr>
<td>Car or Van</td>
<td>79%</td>
<td>155</td>
</tr>
<tr>
<td>Passenger (car or van)</td>
<td>4%</td>
<td>9</td>
</tr>
<tr>
<td>Pedal Cycle</td>
<td>2%</td>
<td>4</td>
</tr>
<tr>
<td>Foot</td>
<td>4%</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>192</td>
</tr>
</tbody>
</table>

Note: Table above shows person trips by mode with vehicular trips from Table 6.2 used to represent taxi, motorcycle and car or van driver trips. Information excludes Works from home, does not work and other categories.

6.10. In terms of multi-modal trips, the development could be expected to generate an average of 1 pedestrian trip (to or from the development) approximately every 7-8 minutes during the peaks. These trips should be readily accommodated by the existing and proposed footway provisions in the vicinity of the development. The development would also generate around 4 cyclists per hour during the peaks which would easily be accommodated on the local network. The additional public transport demand of up to 17 passengers per hour would be spread across the local bus services. This may increase for this development should a bus service run through it.

Trip Distribution

6.11. The distribution of the proposed development traffic on the local network has been determined using the 2011 Census ‘Location of usual residence and place of work by method of travel to work’ for the Middle Super Output Area (MSOA) of Broadland 004 that includes Horsford which is available on the Nomis website (www.nomisweb.co.uk/census/2011/wu03EW).

6.12. This data shows the number of residents in the MSOA Broadland 004 that commute to work to each destination MOSA zone. A table of all the locations residents are travelling to is included in Appendix A for reference.

6.13. The distribution of vehicular traffic has then been taken by assigning zones with 4 or more car driver drips to one of three routes, with the aid of internet based route finding tools. For trips internal to Broadland 004, the likely employment locations for car drivers have been taken as Hevingham, Hainford and Stratton Strawless which would be reached via the B1149 to the north. The total trips on each route have then converted to a percentage which is shown below:

1. B1149 Holt Road (south) = 69%
2. B1149 Holt Road (north) = 20%
3. West = 11%
6.14. The above distribution has been applied to the committed and proposed developments with the assignment of ‘west’ trips for the committed development being via the B1149 and Drayton Lane to the south, whilst for the proposed development these trips are assigned via Haveringland Road and Felthorpe.

6.15. The route of the Norwich Northern Distributor Road (NDR), which is under construction to the south of Horsford, has been reviewed with respect to future traffic distribution for the committed and proposed developments. A review of the plans which were submitted as part of the application for the road indicates that the NDR’s route would not affect the distribution of traffic at either of the junctions being assessed in this TA.

6.16. The traffic distribution for the committed and proposed developments is shown graphically in Appendix D. The committed development is shown on Traffic Flow Diagrams 5 and 6 which has then been added to the 2021 base traffic flows with the result shown on Traffic Flow Diagrams 7 and 8. The proposed development is shown on Traffic Flow Diagrams 9 and 10 with the cumulative flows shown on Traffic Flow Diagrams 11 and 12.

### Construction Traffic

6.17. It is difficult to ascertain construction vehicle movements associated with the development until a contractor has been appointed. It is recommended therefore that on any planning approval given, a Construction Management Plan (CMP) is conditioned to be prepared and agreed with NCC. This will allow input from a Principal Contractor (PC) on vehicle numbers, routing and programming.

6.18. Given the site’s location, construction traffic is likely to reach the development via the B1149 and Green Lane. The majority of construction traffic is likely to be to/from the south via Norwich. The access road into the development should be built to at least binder course level and wheel wash facilities located prior to vehicles leaving the site. The proposed footway along Green Lane between should also be provided to reduce potential conflict with pedestrians.

6.19. There will be a range of construction vehicles that will be permanently on site during the construction period such as earth moving vehicles and mobile cranes, etc. They will be brought to site and taken from the site at the beginning and end of the main construction period. These movements will not affect the daily operation of the road network. Any abnormal loads associated with on-site construction vehicles will be managed with respect to the current NCC Highways abnormal load policies; however, there are not expected.

6.20. The main impact on the network will be from the delivery of construction materials and removal of waste from site. Waste will typically be taken away on rigid 3-axle tipper trucks. With regard to typical vehicle numbers, there will be a higher number of waste removal movements during the first year of the construction period. At a peak time of waste removal, it could be expected that there could be a two-way movement every 15 minutes during the working day, which would equate to approximately 32
movements each weekday (based on 8 hour working days) and potentially half that on a Saturday.

6.21. Delivery movements, will also be daily movements but likely to peak during the mid-part of the construction programme and will typically be larger 5-axle rigid vehicles. It could reasonably be expected that such a two-way movement could occur every 30 minutes at a peak time. This would equate to approximately 16 HGV deliveries over a peak working day (based on 8 hour working days) and less than half of this on a Saturday. There will be no working on Sundays or Bank Holidays.

6.22. There would also be vehicular movements associated with smaller ‘transit’ type vans and sub-contractor vans undertaking work, such as carpentry, electrics, plumbing, etc. These daily traffic movements will be later in the construction programme, as and when the proposed buildings begin to be constructed. These movements will typically not be in traditional weekday peak hours and will be limited to around 10-15 per day as they will be restricted to the build rate of the houses.

6.23. General construction staff, such as house builders, will be on site for most of the construction programme and will most likely be from around the local area. Construction staff typically start work between 07.00 and 07.30 and finish between 15.30 and 18.00, (depending on the time of year), thus, most of the time vehicle movements will be outside of the traditional weekday peak hours of traffic on the network. It is recommended that to promote sustainable travel for construction operatives the CMP reviews options of car/van sharing and use of public transport for the workforce.

6.24. Staff numbers on site are likely only to be around 30-40 at a peak time of construction, thus the number of small vehicles will be less in comparison to the flows that are expected to be produced by the residential site in full operation.
7. **HIGHWAY CAPACITY**

7.1. Key junctions on the local highway network have been assessed for vehicular capacity to 2021, 5 years from the submission of the planning application. Standard modelling software Junctions 9 has been used in the junction assessments. Outputs from the junction models described in this section are included at Appendix I. Traffic inputs and outputs in each model are expressed in PCUs.

**B1149/Green Lane/Haveringland Road**

7.2. The junction of the B1149/Green Lane/Haveringland Road is presently a crossroad priority controlled junction with the B1149 forming the major road. As part of the development proposal described in Section 5, an improvement to this junction is proposed to create a right/left stagger arrangement as shown on Drawing 47172-PP-008. The updated junction has been assessed with Junctions 9 at 2021 with development (including committed) and the results are summarised in Table 7.1. The results indicate that the junction will operate within capacity with all RFCs below the preferred maximum value of 0.85.

<table>
<thead>
<tr>
<th>Arm/Movement</th>
<th>AM Peak</th>
<th></th>
<th>PM Peak</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queue</td>
<td>RFC</td>
<td>Queue</td>
<td>RFC</td>
</tr>
<tr>
<td>Green Lane</td>
<td>0.4</td>
<td>0.28</td>
<td>0.2</td>
<td>0.17</td>
</tr>
<tr>
<td>RT to Haveringland Road</td>
<td>0.0</td>
<td>0.00</td>
<td>0.0</td>
<td>0.01</td>
</tr>
<tr>
<td>Haveringland Road</td>
<td>0.5</td>
<td>0.34</td>
<td>0.9</td>
<td>0.48</td>
</tr>
<tr>
<td>RT to Green Lane</td>
<td>0.1</td>
<td>0.08</td>
<td>0.5</td>
<td>0.21</td>
</tr>
</tbody>
</table>

7.3. The B1149/Mill Lane/Pyehurn Lane junction is a priority crossroad arrangement with the B1149 forming the major arms. Pyehurn Lane is effectively a minor access with a footway crossing to the B1149 and no formal junction radii or give-way road markings are present. A zebra crossing lies immediately to the south of the junction, however this has not been included in the model due to a limitation in the software that does not allow a crossing to be modelled at the same time as the B1149 right turning traffic (to Mill Lane) blocking the ahead movement using the standard PICADY module within Junction 9. The Mill Lane arm of the junction was modified for the ‘Butterfly Mill’ development and this is reflected in the model.

7.4. The Junctions 9 assessment of the existing and future traffic scenarios are summarised in Tables 7.2 to 7.4. No adjustments have been made to the surveyed flow to account for construction traffic of ‘Butterfly Mill’ which would not be present in the future in the interest of a robust assessment.
Table 7.2 – B1149/Mill Lane/Pyehurn Lane Junction Assessment
2016 Observed Traffic

<table>
<thead>
<tr>
<th>Arm/Movement</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queue</td>
<td>RFC</td>
</tr>
<tr>
<td>Mill Lane</td>
<td>0.7</td>
<td>0.43</td>
</tr>
<tr>
<td>RT to Pyehurn Lane</td>
<td>0.0</td>
<td>0.03</td>
</tr>
<tr>
<td>Pyehurn Lane</td>
<td>0.1</td>
<td>0.05</td>
</tr>
<tr>
<td>RT to Mill Lane</td>
<td>0.6</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Table 7.3 – B1149/Mill Lane/Pyehurn Lane Junction Assessment
2021 with Committed Development

<table>
<thead>
<tr>
<th>Arm/Movement</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queue</td>
<td>RFC</td>
</tr>
<tr>
<td>Mill Lane</td>
<td>1.6</td>
<td>0.63</td>
</tr>
<tr>
<td>RT to Pyehurn Lane</td>
<td>0.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Pyehurn Lane</td>
<td>0.1</td>
<td>0.06</td>
</tr>
<tr>
<td>RT to Mill Lane</td>
<td>0.8</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Table 7.4 – B1149/Mill Lane/Pyehurn Lane Junction Assessment
2021 with Development

<table>
<thead>
<tr>
<th>Arm/Movement</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queue</td>
<td>RFC</td>
</tr>
<tr>
<td>Mill Lane</td>
<td>2.2</td>
<td>0.70</td>
</tr>
<tr>
<td>RT to Pyehurn Lane</td>
<td>0.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Pyehurn Lane</td>
<td>0.1</td>
<td>0.06</td>
</tr>
<tr>
<td>RT to Mill Lane</td>
<td>1.1</td>
<td>0.34</td>
</tr>
</tbody>
</table>

7.5. The modelling results show that the junction is forecast to remain within capacity in the ‘with development’ scenario.

7.6. The junctions assessed for capacity in this section have future year forecast RFC’s of less than the preferred maximum of 0.85. The impact of the developments expected vehicular traffic is therefore not considered to be severe in accordance with planning policy.
SUMMARY AND CONCLUSION

8.1. Richard Jackson Ltd have reviewed the transport implications of 259 dwellings on land east of Holt Road, Horsford, Norfolk. This TA has also reviewed the relevant planning policy for the site with respect to transport and it is considered that the proposals, whilst not an allocated site, comply with policy with respect to transport matters.

8.2. A number of local facilities, including primary education, lie within walking or cycling distance of the site. The local facilities can be reached via a network of existing and proposed footways via Green Lane and Holt Road or via the adjacent ‘Butterfly Mill’ development.

8.3. A route into the development suitable for buses will be provided which would link with the neighbouring ‘Butterfly Mill’ development following consultation with local operator, First. A bus gate facility between the developments is therefore proposed to facilitate future bus provision. The location of bus stops along the route and the specification of the proposed bus gate facility would be considered further at the detailed design stage.

8.4. For travel by private car, Green Lane provides access to the B1149 Holt Road for access to Holt in the north and Norwich to the south. Green Lane will be upgraded to a 6.0m wide road, with a 2.0m wide footway on the southern side (generally consistent with a Type 2 road) and its junction the B1149 improved. The main link into the development will be to Type 2 standard. In addition, pedestrian, cycle, bus and emergency vehicle access will be provided via the adjacent ‘Butterfly Mill’ development.

8.5. In order to minimise private car use, a TP has been identified which would be secured through a planning condition/obligation. The TP would include sustainable travel initiatives such as cycle and public transport vouchers which would be promoted to residents via a Travel Welcome Pack.

8.6. Traffic modelling of the B1149 Holt Road junctions at Green Lane and Mill Lane has been undertaken for the future weekday AM and PM peak hours. No operational issues were found and the junctions are expected to be within capacity (with forecast RFC’s of less than 0.85) with the completed development at 2021. The impact of the developments expected vehicular traffic is therefore not considered to be severe in accordance with planning policy.

8.7. The review of local highway safety records found no specific issues, casualties or locations of accidents. The development is considered unlikely to have a disproportionate impact on local highway safety.

8.8. The expected construction traffic has also been considered with construction vehicles likely to use the B1149 to/from the south. A Construction Management Plan has however been identified to help manage traffic movements during the construction period.

8.9. In conclusion, the proposed development would be in accordance with the aims and objectives of Local and National Transport Planning policy and would not have a severe impact on the local transport network.
<table>
<thead>
<tr>
<th>Client:</th>
<th>Drawing Title:</th>
<th>Site Location Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Wilson Homes (Eastern)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Date:</th>
<th>Job No:</th>
<th>Dwg No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land East of Holt Road, Horsford</td>
<td>14/10/16</td>
<td>47172</td>
<td>Figure 1</td>
</tr>
</tbody>
</table>

Holt Road, Horsford, Location
Grid Reference 618900, 317350 and Postcode: NR10 3ED

SITE LOCATION

SITE LOCATION (indicative)

REPRODUCED FROM ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE, © CROWN COPYRIGHT RICHARD JACKSON LTD – ACC No. 100002572
This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.

**Project Title:**
LAND EAST OF HOLT ROAD, HORSFORD

**Client Title:**
DAVID WILSON HOMES (EASTERN)

**Scale:**
1:10,000 @A3

**Date:**
11/10/16

**Job Manager:**
M GEDDES

**Drawing No.:**
47172/FIGURE 2

**Drawing Status:**
INFORMATION

**Back:**
Houghton Plntation
Fellhoove Common

**Front:**
Horsford
Lodge Farm

**Key:**
- INDICATIVE SITE BOUNDARY
- FIRST BUSES - 36/36B
- SANDERS COACHES - 42 & 45
- NEAREST (EXISTING) BUS STOPS
- PRIMARY SCHOOL
- PUBLIC SCHOOL
- DENTIST/PHARMACY
- PLACE OF WORSHIP
- CHILDREN'S CENTRE
- VILLAGE HALL
- POST OFFICE/LOCAL SHOP
- RECREATION GROUND
- LOCAL EMPLOYMENT
- PUBLIC RIGHT OF WAYS

Contains Ordnance Survey data © Crown copyright and database right 2015

© Richard Jackson Ltd
NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE SURVEY DATUM.
3. ROAD MARKINGS SHOWN INDICATIVELY AND FOR INFORMATION ONLY.
4. BASED ON TOPOGRAPHICAL SURVEY BY RANDALL SURVEYS LLP DRAWINGS 13905/TM/1 TO 8 DATED MARCH 2016.
5. HIGHWAY WORKS ARE SHOWN INDICATIVELY AND ARE SUBJECT TO DETAILED DESIGN.
6. DRAINAGE AND STREET LIGHTING TO BE APPRAISED AT DETAILED DESIGN STAGE.
NEW DRIVEWAY ACCESS TO EXISTING DWELLING
EXISTING PRIVATE ACCESS MAINTAINED
EXISTING SPEED LIMIT CHANGE LOCATION TO BE MOVED NORTH AND INCORPORATED INTO VILLAGE GATEWAY FEATURE TO BE ACCOMMODATED WITHIN THE EXISTING HIGHWAY BOUNDARY. TYPE AND POSITION OF FEATURE TO BE DETERMINED IN CONSULTATION WITH THE HIGHWAY AUTHORITY AT DETAILED DESIGN.

EXISTING SPEED LIMIT SIGNAGE
SPEED LIMIT ON GREEN LANE TO BE REDUCED TO 30mph
COMBINED EP/TP APPARATUS TO BE RELOCATED

NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE SURVEY DATUM.
3. ROAD MARKINGS SHOWN INDICATIVELY AND FOR INFORMATION ONLY.
4. BASED ON TOPOGRAPHICAL SURVEY BY RANDALL SURVEYS LLP (DRAWINGS 13905/TM/1 TO 8 DATED MARCH 2016).
5. HIGHWAY IMPROVEMENTS ARE SHOWN INDICATIVELY AND ARE SUBJECT TO DETAILED DESIGN.
6. DRAINAGE AND STREET LIGHTING TO BE APPRAISED AT DETAILED DESIGN STAGE.
DO NOT SCALE

4.0m WIDE BUS/EMERGENCY VEHICLE LINK WITH ENFORCEMENT SUCH AS CCTV

LOW LEVEL (LESS THAN 0.6m HIGH) LANDSCAPING AREA TO ALLOW FORWARD VISIBILITY

DROPPED KERB TO BE PROVIDED FOR BUS/CYCLE CROSSINGS

NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. EXISTING AND PROPOSED TYPE 2 ROADS & SIZE 3 TURNING AREAS BASED ON ARCHITECTS PLANS.
3. BUS/EMERGENCY VEHICLE LINK ENFORCEMENT METHOD TO BE DETERMINED AT DETAILED DESIGN STAGE.
4. HIGHWAY WORKS ARE SHOWN INDICATIVELY AND ARE SUBJECT TO DETAILED DESIGN.
5. DRAINAGE AND STREET LIGHTING TO BE APPRAISED AT DETAILED DESIGN STAGE.
Dear Mrs Poole

**Re: Green Lane, Horsford**

Richard Jackson Ltd have been instructed to review the highway implications of development of approximately 250 dwellings on land at Green Lane, Horsford. The location of the site is shown on the site location plan attached. The development is of sufficient size as to require a Transport Assessment (TA) support any future planning application. We would therefore be grateful for your input on the proposed scope set out in this letter.

**Existing Conditions**

The site to the south of Green Lane is presently in agricultural use and has an approximate grid reference of 618900, 317350. The site is bound by Green Lane to the north, existing dwellings to the southwest and agricultural fields to the east. To the south east is the “Butterfly Mill” development which is due to be completed by the end of 2016.

Within the vicinity of the site, Green Lane is approximately 2.9m in width and leads to the B1149 Holt Road. Green Lane is presently subject to the national speed limit (60mph).

The access to the wider network is via the Green Lane junction with Holt Road, the latter of which is approximately 6.1m – 6.6m wide. The junction and the B1149 to the south are subject to a 40mph speed limit with the national speed limit in force to the north and on Haveringland Road, opposite.

There are presently no footways along Green Lane, however from the junction with the B1149 Holt Road a 1.8m wide footway is present on the northeast side of the road leading south from Green Lane towards the village centre. Footways are also present within the “Butterfly Mill” development on the sites southern boundary which would provide an alternative route for the completed development to the village centre via the primary school on Mill Lane.

Cont’d.../
The nearest bus stops to the site are on Holt Road at Sandy Lane (south/Norwich bound) and Pinelands Industrial Estate (north/Holt bound). These are approximately 1.2km from the site.

The TA would include a review of the existing conditions and available local facilities, including a description of the route from the development to the local primary school via the adjacent “Butterfly Mill” development.

**Highway Safety**

Local highway injury accident data would be reviewed in the TA for the most recent three year (36 month) period available to the Highway Authority. The proposed study area, is for the B1149, 250m north of Green Lane to 100m south of Mill Lane, 100m of Haveringland Road from its junction with the B1149, Green Lane between the B1149 and the site frontage and Mill Lane between the B1149 and the “Butterfly Mill” development.

**Proposed Development and Access**

The proposed development will comprise of approximately 250 dwellings, a layout for which is currently being prepared by the architect. We would be grateful if you could confirm which of you colleagues (if not yourself) should be consulted separately on the layout in advance of a planning application should a full permission be applied for.

The development will take its primary access from Green Lane to the northern boundary of the site where a Type 2 road would be provided into the development. Between the site and the B1149 Holt Road, Green Lane would be improved to 6.0m wide with a 2.0m footway on the southern side (which is generally consistent with a Type 2 road, given the pedestrian desire lines would be to/from the south). The junction with the B1149 would be improved to provide a right/left stagger by utilising land of the adjacent property, 360 Holt Road, and whilst retaining the existing dwelling. The access arrangement is shown on Drawing 47172-PP-003 attached and we would be grateful for your opinion on its acceptability in principal at this stage.

In addition to the access to Green Lane a 3.7m wide foot/cycle/emergency access would also be provided to “Butterfly Mill” and this would be included on the architect’s layout.

Consideration would be given within the TA for the potential for additional bus stops to be provided in the vicinity of the B1149/Green Lane junction to maximise potential use of those services continuing to the north of Horsford.

**Trip Generation**

As the “Butterfly Mill” development is not yet complete and construction traffic is still present, it is not be possible to obtain an accurate, location specific trip generation by observation. It is therefore proposed to apply the vehicular (TRICS based) trip rates that were used for the “Butterfly Mill” development to the current proposals. The trip rates are shown in Table 1 along with the trip generation for 250 dwellings.
Table 1 – Proposed Development Vehicular Trip Generation

<table>
<thead>
<tr>
<th>Use</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arr</td>
<td>Dep</td>
</tr>
<tr>
<td>Residential trip rate per dwelling</td>
<td>0.163</td>
<td>0.435</td>
</tr>
<tr>
<td>250 Dwellings</td>
<td>41</td>
<td>109</td>
</tr>
</tbody>
</table>

The TA would also include an estimate of multi-modal trips for the proposed development.

Trip Distribution

Trip distribution has been taken from the 2011 Census “Location of usual residence and place of work by method of travel to work” for residents of the Middle Super Output Area Broadland 004. The trip distribution considers “Driving a car or van” only and where a minimum of 4 trips are made between two zones. Routes between the site and the origin/destination are assigned to the route on an all or nothing basis using the most direct route, or where multiple routes options were available, with the aid of route planning tools in order to identify the most likely route. Trips internal to Broadland 004 would be considered as travelling north and then towards Hevingham, Hainford and Stratton Strawless. A copy of the analysis is attached and the resulting distribution is summarised in Table 2.

Table 2 – Trip Distribution

<table>
<thead>
<tr>
<th>Route No.</th>
<th>Route Name</th>
<th>Residential Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B1149 South</td>
<td>69%</td>
</tr>
<tr>
<td>2</td>
<td>B1149 North</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>West</td>
<td>11%</td>
</tr>
</tbody>
</table>

For the proposed development, trips to the west would be assigned via Haveringland Road, with other trips to the north/south on the B1149 accordingly.

Committed Development

The “Butterfly Mill” development is not yet completed, therefore at the time of the traffic surveys any remaining dwellings would be considered as committed development. Trip rates and distribution for these would be as for the proposed development above with trips to the west assigned via Drayton Lane, to the south of Mill Lane.

Highway Capacity

The following junction is considered to be appropriate for the assessment of vehicular capacity using the TRL program Junctions 9.
B1149/Green Lane/Haveringland Road

We would be grateful for your guidance on the potential junction(s) for the capacity assessment. Unless you are aware of any existing, valid, traffic surveys, a new traffic survey of the above junction would be carried out on a weekday between the hours of 07:00-10:00 and 16:00-19:00.

We have reviewed the route of and access points to the NDR and do not believe this would have an impact on the junction(s) to be assessed or the distribution of traffic. If you feel this is not the case then please advise accordingly.

Traffic Forecast

Background traffic growth would be applied for five years from the year of planning application i.e. 2021, using growth factors obtained from the TEMPRO computer programme. The zone for Horsford has been used with road type rural, principal and the expected growth factors for 2016 to 2021 (for which screenshots are enclosed) are as follows:

<table>
<thead>
<tr>
<th>Site</th>
<th>2016-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekday AM</td>
<td>1.0999</td>
</tr>
<tr>
<td>Weekday PM</td>
<td>1.1052</td>
</tr>
</tbody>
</table>

Travel Plan

The proposed development is of sufficient size to require a Travel Plan and we would be grateful if you can advise if the future provision of such should be conditioned. Should a Travel Plan be required to accompany a planning application, then please advise if there are any location specific measures or targets which we should consider during its preparation.

I trust the above provides a satisfactory base for the TA which would accompany a forthcoming planning application. We would, however, be grateful for any comments you may have or your acceptance of the above scope and your opinion on the access proposal. In the meantime should you have any queries, please do not hesitate to contact us.

Yours sincerely

Duncan Palmer
on behalf of Richard Jackson Limited

encs
Mill Lane, Horsford, Location
Grid Reference 618900, 317350 and Postcode: NR10 3ED

REPRODUCED FROM ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE, © CROWN COPYRIGHT RICHARD JACKSON LTD – ACC No. 100002572

SITE LOCATION

Client:
 BDW Eastern Counties

Job Title:
 Mill Lane, Horsford

Date: 05/05/16
Job No: 47172
Dwg No: Figure 1

6 The Old Church, St Matthews Road, Norwich, NR1 1SP
Tel: 01603 230240
www.richardjackson.uk.com
### 2011 Census Trip Distribution Summary

**Route** | **Route Name** | **Total No of Car or Van Trips** | **By Car or Van** | **Motorcycle** | **Total No of Trips** | **All Peak Hr Trip Generation** | **FIM Peak Hr Trip Generation**
--- | --- | --- | --- | --- | --- | --- | ---
316-19 S  | 316-19 S | 1557 | 68% | 28 | 73 | 78 | 124 | 124 |
316-19 B  | 316-19 B | 479 | 20% | 7 | 20 | 20 | 44 | 44 |
Hevingham Road | 255 | 12% | 6 | 17 | 11 | 6 |
**Total** | | 2295 | 100% | 45 | 77 | 62 | 184 | 184 |

| notes | | | | | | | |
--- | | | | | | | |
Notes: All zones with zero trips have been removed. Zones with less than 4 Car Driver Trips are ignored.

### Method of Travel to Work

#### All categories
- **Car or Van**: 1557
- **Motorcycle**: 479
- **Bus/Coach (Minibus)**: 255
- **Train**: 3
- **Light Rail**: 0
- **Home & Minibus**: 10
- **Bicycle**: 1
- **On foot**: 2
- **Other**: 6

#### Total Number of Trips

<table>
<thead>
<tr>
<th>Route</th>
<th>Number</th>
<th>Place of work</th>
<th>2011 super output area - middle layer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Home & Minibus

- **Home & Minibus**: 10

---

### By Car or Van

- **By Car or Van**: 1557

---

### Motorcycle

- **Motorcycle**: 479

---

### Place of work: 2011 super output area - middle layer

#### Broadland
- **Broadland 003**: 3
- **Broadland 001**: 1
- **Broadland 002**: 1
- **Broadland 003**: 1

#### Breckland
- **Breckland 005**: 4
- **Breckland 007**: 1
- **Breckland 006**: 1
- **Breckland 008**: 1

#### Colchester
- **Colchester 001**: 1
- **Colchester 002**: 1
- **Colchester 003**: 1

#### Croydon
- **Croydon 006**: 1
- **Croydon 003**: 1
- **Croydon 002**: 1

#### Cambridgeshire
- **Cambridgeshire 001**: 1
- **Cambridgeshire 002**: 1
- **Cambridgeshire 003**: 1

#### Chelmsford
- **Chelmsford 001**: 1
- **Chelmsford 002**: 1
- **Chelmsford 003**: 1

#### City of London
- **City of London 001**: 1

#### Colchester
- **Colchester 009**: 1

#### Dacorum
- **Dacorum 002**: 1

#### Dartford
- **Dartford 006**: 1

#### Dover
- **Dover 003**: 1

#### East Cambridgeshire
- **East Cambridgeshire 001**: 1

#### Essex
- **Essex 001**: 1

#### Forest Heath
- **Forest Heath 005**: 1

#### Great Yarmouth
- **Great Yarmouth 003**: 1
- **Great Yarmouth 002**: 1
- **Great Yarmouth 001**: 1

#### Harrow
- **Harrow 002**: 1

#### Hastings
- **Hastings 001**: 1

#### Heywood
- **Heywood 002**: 1

#### Kent
- **Kent 001**: 1

#### Luton
- **Luton 001**: 1

#### Manchester
- **Manchester 001**: 1

#### Medway
- **Medway 001**: 1

#### Merseyside
- **Merseyside 001**: 1

---

### Notes

- All areas covered by ONS Super Output Areas.
- The method of travel to work is measured between different geographic areas. Some counts will be affected, particularly small counts.

---

### Treatment

- **Transportation**: 2011 Census Trip Distribution Summary
- **Notes**: All zones with zero trips have been removed. Zones with less than 4 Car Driver Trips are ignored.

---

### Structure

- **Total No of Car or Van Trips**: 1557
- **By Car or Van**: 1557
- **Motorcycle**: 479
- **Total No of Trips**: 2295
- **Home & Minibus**: 10
- **Bicycle**: 1
- **On foot**: 2
- **Other**: 6

---

### Further Details

- **Place of work**: 2011 super output area - middle layer
- **Route Name**
- **Arrival & Departure**
- **Notes**
- **Total**

---

### Additional Information

- **Notes on data**: All areas covered by ONS Super Output Areas.
- The method of travel to work is measured between different geographic areas. Some counts will be affected, particularly small counts.

---

### Conclusion

- The study provides a comprehensive overview of the method of travel to work in different geographic areas.
- The data is significant for understanding transportation patterns and planning future infrastructure.
- The method of travel to work is measured between different geographic areas, which may affect the accuracy of the counts, especially in small areas.

---

### Acknowledgments

- The data was provided by the Office for National Statistics and the Department for Transport.
- Further research is necessary to refine the methodology and improve the accuracy of the counts.

---

### Further Reading

- ONS Census: Travel to Work Summary Report 2011
- Department for Transport: Transportation Planning
- Urban Mobility: Methodology for the Study of Transportation Patterns

---

### Contact Information

- For more information, please contact the lead researcher at leadresearcher@transportstudy.co.uk.
In order to protect against disclosure of personal information, records
Afternoon Duncan,

I would prefer new counts. The site is likely to be very sensitive and it would be better to have up to date counts.

Liz

Liz Poole BSc (Hons), MSc, MIHE
Acting Principal Engineer (Major & Estate Development)

Developer Services
Environment & Transport
Community & Environmental Services
Tel: 01603 638009
Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk

Norfolk County Council
General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

Dear Liz

Further to your e-mail, I will include an assessment of the Mill Lane/Pyehurn Lane/Holt Road junction in the TA.

Looking back at the previous phase of development, the junction was counted on 25th March 2013. Would the existing count data be acceptable for the current proposal (assuming an application was made before the end of 2016 and the applicable growth and phase 1 traffic flows were added)?

Thanks

Duncan

Duncan Palmer BSc (Hons) MCIHT MTPS
Dear Duncan,

Thanks for this, can you also cover the Mill Lane/Pyehurn Lane/Holt Road junction which is the one which serves the school.

Liz

Liz Poole BSc (Hons), MSc, MIHE
Acting Principal Engineer (Major & Estate Development)
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Community & Environmental Services
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Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk
Norfolk County Council
General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

From: Poole, Liz [mailto:liz.poole@norfolk.gov.uk]
Sent: 16 May 2016 09:48
To: Duncan Palmer <DuncanPalmer@rj.uk.com>
Subject: RE: Green Lane, Horsford

Dear Duncan,

Thanks for this, can you also cover the Mill Lane/Pyehurn Lane/Holt Road junction which is the one which serves the school.

Liz

Liz Poole BSc (Hons), MSc, MIHE
Acting Principal Engineer (Major & Estate Development)
Developer Services
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Community & Environmental Services
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Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk
Norfolk County Council
General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

From: Duncan Palmer [mailto:DuncanPalmer@rj.uk.com]
Sent: 16 May 2016 09:42
Liz

Thank-you for letting me know the date for the next Development Team meeting.

We are proposing to count (unless you are aware of any existing, valid, survey data, and to also assess for capacity), the B1149/Green Lane/Haveringland Road junction. The count would be for a weekday between the hours of 07:00-10:00 and 16:00-19:00. Perhaps you could advise if this will be sufficient, or if there are any other junctions which the Highway Authority would require to be assessed.

Kind regards

Duncan

Duncan Palmer  BSc (Hons) MCIHT MTPS

www.rj.uk.com

Out of hours emergency engineering service: 01206 228833
Registration No. 2744316 England, 26 High Street, Hadleigh, Suffolk, IP7 5AP
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Please consider the environment before printing this e-mail.

From: Poole, Liz  [mailto:liz.poole@norfolk.gov.uk]
Sent: 16 May 2016 09:03
To: Duncan Palmer  <DuncanPalmer@rj.uk.com>
Subject: RE: Green Lane, Horsford

Dear Duncan,
I will take this to our next Development Team on 23 May 2016.

If you let me have an indication of where you are proposing to undertake counts then I can comment.

Kind regards

Liz

Liz Poole BSc (Hons), MSc, MIHE
Acting Principal Engineer (Major & Estate Development)
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Community & Environmental Services
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Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk
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General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

From: Duncan Palmer [mailto:DuncanPalmer@rj.uk.com]
Sent: 13 May 2016 17:11
To: Poole, Liz <liz.poole@norfolk.gov.uk>
Cc: Mark Geddes <MarkGeddes@rj.uk.com>
Subject: Green Lane, Horsford

Liz

Further to our brief telephone conversation of last week, please find attached a scoping note for a potential development of 250 dwellings at Green Lane, Horsford.

I appreciate that you may need to consult with colleagues on the access proposal before responding in full. However, an early steer on the highway authority’s requirement for traffic data collection would be appreciated so that we can have the data collected during the natural period.

If you have any queries or questions I would be happy to discuss.

Kind regards

Duncan

Duncan Palmer BSc (Hons) MCIHT MTPS

Richard Jackson Engineering Consultants
Dear Duncan,

Thanks for the email. If the High School is over 3 miles then there is no need for a Walk to School Audit. You will need to do one for the primary school although that will be dependent on how the development is build out.

Liz

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Developer Services
Environment & Transport
Community & Environmental Services
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Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk
Norfolk County Council
General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk

Thank you for passing on the layout.

I have been made aware that a safe routes to school assessment may be need for the TA. The route to the Horsford C Of E Va Primary School on Mill Lane would be via a link to the existing development (‘Butterfly Mill’ off Mill Lane) and an assessment of the route can provide if needed. According to the Norfolk Schoolfinder, Horsford C Of E Va Primary School feeds to Hellesdon High School. As this is in excess of 3 miles, it is my understanding that the route to school would be via school bus and that an assessment would therefore not be needed (there would of course be footways between the site and the bus stops).

Can you confirm the requirement please?

Thanks

Duncan
Liz

With regards the indicative layout shown on drawing 6933-SK02 rev A I would comment as follows:

1. The priority on Green Lane should divert into the site, as there is very little need for traffic to travel beyond this point.
2. Due to the distance of the dwellings within this development from the nearest bus stop provision for buses through this site will need to be made. Additionally, a development of this scale should be provided with a link to the development to the south, which has been designed with a type 2 road to the adjoining boundary. However, if there is no public support for a link to the south, a bus only link will need to be considered. A cyclepath link to the south will also be required whichever option is developed.
3. Roads designed to accommodate buses should be at least 6.0m wide.
4. If the development remains accessed only by Green Lane. A second point of access and a type 2 loop road on the northern part of the site and a type 3 loop road on the southern part (see attached) should be provided.
5. Green Lane should be widened to 6.0m with a 2.0m wide footway provided along the entire site frontage.
6. All 4 and 5 bedroom dwellings should have 3 parking spaces each. All other dwellings should have 2 parking spaces.
7. To be considered as a parking space all garages must have minimum internal dimensions measuring 3.0m x 6.0m.
8. Notwithstanding point 7 above, you will be aware garages are rarely used for parking, which can cause a significant amount of on-street parking from 2 & 3 bedroom dwellings if they are left with only 1 parking space. As a consequence, where possible I would suggest garages should be set back sufficiently so 2 parking spaces can be provided in front. Alternatively, consideration should be given to the provision of visitor parking in the form of roadside lay-bys in the vicinity of affected properties.
9. Parking courts are wasteful of space and are not fully utilised by occupants or their visitors resulting in significant on-street parking. Where they are unavoidable they should serve a small number of dwellings and not be grouped together with other dwellings reliant on parking courts. Additionally I would expect on-street parking to be managed by provision of roadside lay-bys.
10. Cross roads between adopted roads should be avoided.
11. Visibility splays measuring 2.4 x 33m should be provided at all junctions, including those with shared private drives.
12. The proposed road alignment does not provide sufficient traffic calming to maintain vehicle speeds to 20mph.
13. Private drives that provide a link between 2 x adopted roads will encourage their use by the public and should therefore be upgraded to a type 6 shared surface link road, which could also reduce the need for cul-de-sac.
14. All shared private drives require a size 5 turning head, unless the furthest dwelling is more than 45m from the adopted highway, in which case a size 3 turning head is required.

Andrew