6.0 TRANSPORT & ACCESS

Introduction

6.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of Transport & Access.

Policy Context

National Planning Policy

National Planning Policy Framework

6.2 The Government’s Department for Communities and Local Government (CLG) published the National Planning Policy Framework (NPPF) in March 2012. The NPPF identifies a set of core land use planning principles, which include the need to actively manage patterns of growth to make the fullest use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.

6.3 In paragraph 29, the NPPF outlines that transport policies have an important role to play in facilitating development but also in contributing to wider sustainability and health objectives. It acknowledges that smarter use of technologies can reduce the need to travel and that the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel.

6.4 Paragraph 32 requires that all developments generating a significant amount of traffic movement should be supported by either a full Transport Assessment or a Transport Statement. These developments need to ensure that all opportunities to maximise sustainable transport modes have been taken up (dependent upon the nature and location of the Site); that safe and suitable access can be achieved for all people; and that improvements to the transport network can be undertaken that cost-effectively limit the significant effects of a development. It also identifies that development will only become unacceptable in transport terms where the residual cumulative impacts of the development are severe.

6.5 With regards to the location of new development, paragraph 35 highlights that developments should be 'located and designed where practicable'

- *To accommodate the efficient delivery of goods and supplies;*
Land South of Salhouse Road, Sprowston

Transport & Access

- give priority to pedestrian and cycle movements, and have high access to quality public transport facilities; and
- consider the needs of people with disabilities by all modes of transport.’

6.6 Travel Plans are part of the Government’s aspirations for future development, with paragraph 36 of the NPPF identifying them as ‘a key tool’ to exploit opportunities for the use of sustainable travel modes. This is, however, balanced by paragraphs 37 and 38 of the NPPF which identify that planning also has a role in promoting green travel by ensuring that developments are located for a balance of the land uses within areas so that facilities such as shopping and employment are located, as much as possible, within walking distance of where people live.

Planning Practice Guidance

6.7 The Government’s Planning Practice Guidance (PPG) includes "Transport evidence bases in plan making and decision making" and "Travel plans, transport assessments and statements in decision-taking". Together this guidance supports the overarching NPPF and provides information on the preparation of transport evidence to support proposed development in the form of transport assessments, statements and travel plans. "Transport evidence bases in plan making and decision making" highlights the importance of a robust evidence base to enable the assessment of the transport impacts of proposed development.

6.8 "Travel Plans, Transport Assessments and Statements in decision-taking" provides guidance on assessing and mitigating the negative transport impacts of developments which generate significant amounts of movements in order to promote sustainable development. It explains that transport assessments focus on thoroughly assessing the potential transport implications of development and may propose mitigation measures to promote sustainable development. Where that mitigation relates to matters that can be addressed by travel demand management measures, the mitigation may inform the preparation of Travel Plan.

6.9 Consideration has been given to these elements of national planning policy and guidance in the preparation of the transport assessment for this proposed Development.

Local Planning Policy

6.10 At a local level, transport policy is defined by Norfolk County Council’s Local Transport Plan, the Joint Core Strategy (JCS) for Broadland, Norwich and South Norfolk adopted March 2011 (amendments adopted January 2014), and the Growth Triangle Area Action Plan (GTAAP).
Norfolk’s Local Transport Plan

6.11 Norfolk’s Local Transport Plan, Connecting Norfolk, sets out the strategy and policy framework for transport up to 2026. This plan is used as a guide for transport investment in Norfolk and considered by other agencies when determining planning or delivery decisions.

6.12 Six strategic aims underpin Norfolk County Council’s (NCC) vision for transport:

- Maintaining and managing the highway network;
- Delivering sustainable growth;
- Enhancing strategic connections;
- Reducing emissions;
- Improving road safety; and
- Improving accessibility.

Joint Core Strategy

6.13 The JCS for Broadland, Norwich and South Norfolk was adopted in 2011 with amendments adopted in 2014. Paragraph 4.2 The Spatial Vision states that the main common themes of the Sustainable Community Strategies are to:

- Have access to suitable housing, jobs, facilities and services for all, whatever their needs;
- Develop the right infrastructure so that people can travel using varied forms of transport;
- Provide opportunities for people to learn at all stages of life; and
- Everyone will have access to suitable housing that reflects their needs.

6.14 The access and transport policy in the adopted JCS specifies the following relevant requirements of new developments:

- That new development be concentrated close to essential services and facilities, to encourage walking and cycling as the primary means of travel with public transport for wider access;
- That all new development demonstrates how it contributes to the creation of a comprehensive and effective network of fast broadband connections to promote economic competitiveness and reduce the need to travel.
**Growth Triangle Area Action Plan**

6.15 The GTAAP has been produced by Broadland District Council (BDC) to support the Local Plan proposals in the area of Old Catton, Sprowston, Rackheath and Thorpe St Andrew.

6.16 The stated purpose of the GTAAP is to "enable and co-ordinate sustainable strategic scale development to the North East of Norwich in accordance with the requirements of the Joint Core Strategy".

6.17 With particular regard to transport, the GTAAP states at paragraph 4.5 that "the key constraint to development is the delivery of the essential utilities and transport infrastructure. In particular the Postwick Junction, the NDR and local road links such as the Brook Farm Link Road". As is demonstrated further in the transport-reporting, the Development does not prejudice the provision of the Brook Farm Link Road, and a sensitivity test has been provided to detail the potential level of impact that the Development may have on the Link Road’s new junction with Plumstead Road East.

6.18 Of key importance is Objective 13 of the GTAAP which requires "new developments to be pedestrian and cycle friendly, providing links to district and local centres and connections to the Norwich Cycle Network”.

6.19 In addition, Strategic Policy GT3: Transport includes the requirement that:

> "the internal layout of new quarters will be consistent with the delivery of public transport orientated developments (PTODS)… Permeable and legible street layouts which support walking and cycling and encourage low traffic speeds will be delivered through new development, encouraging walking and cycling both within and beyond new quarters. New developments will be expected to provide connections to the Norwich Cycle Network."

6.20 These considerations have been of critical importance in the development of the proposals, and details on the proposed enhancements to the local cycling and walking network are provided in accordance with this policy.
Guidance

Parking

6.21 Car and cycle parking standards for new developments are detailed in NCC’s document Parking Standards for Norfolk 2007. The relevant standards for new dwellings are set out in Table 6.1 below.

Table 6.1: Car & Cycle Parking Standards for Norfolk 2007

<table>
<thead>
<tr>
<th>Dwelling Size</th>
<th>Cycle Parking</th>
<th>Car Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bed</td>
<td>None for houses with garage or rear garden for a shed.</td>
<td>1 space</td>
</tr>
<tr>
<td>2 - 3 beds</td>
<td>For flats: 1 space per unit for residents</td>
<td>2 spaces</td>
</tr>
<tr>
<td>4+ beds</td>
<td>1 space per 4 units for visitors</td>
<td>3 spaces</td>
</tr>
</tbody>
</table>

6.22 NCC’s policy on electric vehicle charging points is set out in the document Safe, Sustainable Development which states at policy G3.5 that,

"major developments will be expected to provide at least two parking spaces with plug-in power points to facilitate electric cars for every 200 car parking spaces."

Assessment Methodology

6.23 The assessment of transport-related impacts and access for the Development has been carried out in accordance with national and local policy, guidance and standards.

Assessment Scope

6.24 The scope of the Transport Assessment (TA) for this development has been agreed in consultation with NCC, as the Highway Authority. The scoping process involved the production of a formal written account of the proposed methodology for assessing the forecast transport implications of the proposed development including development description, location plans, trip generation and future modelling methodology and accident data analysis. Additionally, follow-on discussions were held with the Highway Authority which provided guidance, input and background information to inform the methodology used for this assessment and also the processes for the production of this Chapter of the ES.
6.25 An EIA Scoping Report (Appendix 2.1) was also submitted to BDC, and the relevant stakeholders were consulted to agree the most appropriate approach and methodology for this noise assessment.

6.26 The focus of the assessment is on the operation and capacity of the appropriate highway junctions during the AM and PM peak hours of a typical weekday.

**Study Area**

6.27 The study area is defined as the agreed scope of the assessment of the TA (Volume 3 of the ES) and includes the following three junctions on the local highway network:

- The existing signalised junction of Salhouse Road with Blue Boar Lane / Woodside Road;
- The proposed signalised access junction on Salhouse Road; and
- The future roundabout on Plumstead Road associated with the Brook Farm scheme (in the scenario with the link road through to Plumstead Road).

6.28 Both signal junctions will be individually assessed using LINSIG and the roundabout has been assessed using ARCADY.

**Assessment Methodology**

6.29 The assessment has been undertaken on the basis of desk top studies and survey works undertaken, professional judgement, experience from other similar projects and policy guidance and standards.

6.30 Predicted “worst case” Development traffic impacts have been quantitatively assessed by modelling the effect of Development traffic flows along the proposed routes and comparing the baseline and the Development scenarios for the assessment year. The resultant changes in traffic demand have then been assessed against the Department for Transport (DfT) and NCC (as the local highway authority) criteria.

6.31 Guidance for the assessment of the environmental effects of traffic is provided in the IEA’s Guidelines for the Environmental Assessment of Road Traffic4. This document suggests that the scale and extent of the assessment should be limited to highway links subject to traffic flow increases of more than 30% (10% if affecting a sensitive area) or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%.
6.32 Sensitive areas are defined by the presence of sensitive receptors, such as congested junctions or locations where accidents clusters have occurred. No junctions or links on the local road network have been identified as currently having severe congestion or safety issues and consequently no sensitive receptors (transport-related) are identified for the purposes of the ES.

6.33 Guidance on the assessment of the level of impact of severance is also provided in the DfT Design Manual for Roads & Bridges.

6.34 The IEA Guidelines advise that the assessment of transport effects of a development should include the mitigation measures that are proposed to be implemented. The IEA Guidelines recommend that the following types of impacts could be assessed. This is shown below together with a comment as to their relevance in this assessment:

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Relevance in Transport Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration</td>
<td>Scoped out of ES (refer to Chapter 2: EIA Methodology)</td>
</tr>
<tr>
<td>Vehicular routes</td>
<td>Assessed Chapter 6: Transport &amp; Access, and in the TA.</td>
</tr>
<tr>
<td>Pedestrian/cycling routes</td>
<td>Assessed in Chapter 6: Transport &amp; Access, and in the TA.</td>
</tr>
<tr>
<td>Pedestrian/cycling amenity</td>
<td>Assessed Chapter 6: Transport &amp; Access, and in the TA.</td>
</tr>
<tr>
<td>Accidents and road safety</td>
<td>Assessed Chapter 6: Transport &amp; Access, and in the TA.</td>
</tr>
<tr>
<td>Hazardous/dangerous loads</td>
<td>No hazardous or dangerous loads anticipated</td>
</tr>
<tr>
<td>Dust/dirt</td>
<td>Scoped out of ES (refer to Chapter 2: EIA Methodology)</td>
</tr>
<tr>
<td>Construction</td>
<td>Assessed in Chapter 5: Construction Methodology &amp; Programme</td>
</tr>
</tbody>
</table>

Significance Criteria

6.35 The magnitude of change in terms of trip generation has been considered and assessed. Impact assessment refers to the change that is predicted to take place to the existing condition of the environment as a result of the Development.

6.36 The significance of an impact is generally determined as a combination of the sensitivity and/or value of the affected receptors and the predicted extent and/or magnitude of the impact of change. The assessment of significance relies on assessment methodology and professional judgment. Details of generic assessment criteria are shown in Table 6.3 and 6.4 and the Significance Criteria matrix is set out in Table 6.5.
Table 6.3: Methodology for Determining Impact Magnitude

<table>
<thead>
<tr>
<th>Magnitude of Impact</th>
<th>Criteria for assessing impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Total loss or major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post Development character/composition/attributes will be fundamentally changed.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Loss or alteration to one or more key elements/features of the baseline conditions such that post Development character/composition/attributes of the baseline will be materially changed.</td>
</tr>
<tr>
<td>Minor</td>
<td>A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-Development circumstances/situation.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.</td>
</tr>
</tbody>
</table>

Table 6.4: Methodology for Determining Sensitivity

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Example of receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.</td>
</tr>
<tr>
<td>Moderate</td>
<td>The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.</td>
</tr>
<tr>
<td>Low</td>
<td>The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.</td>
</tr>
</tbody>
</table>

Table 6.5: Significance Criteria

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Sensitivity</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Major</td>
<td>Major Adverse/Beneficial</td>
<td>Major - Moderate Adverse/Beneficial</td>
<td>Moderate - Minor Adverse/Beneficial</td>
</tr>
<tr>
<td>Moderate</td>
<td>Major - Moderate Adverse/Beneficial</td>
<td>Moderate - Minor Adverse/Beneficial</td>
<td>Minor Adverse/Beneficial</td>
<td></td>
</tr>
<tr>
<td>Minor</td>
<td>Moderate - Minor Adverse/Beneficial</td>
<td>Minor Adverse/Beneficial</td>
<td>Minor Adverse / Beneficial - Negligible</td>
<td></td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td></td>
</tr>
</tbody>
</table>

6.37 The assessment of significance considers existing transport conditions as a baseline and provides a prediction of the future effect on the local network for the construction and operational phase of the Development.

6.38 The assessment of sensitivity and significance has been based on the IEA Guidelines, DfT guidance documents, and on consultation with NCC which requires the Development to be assessed on the identified vehicle routes in terms of percentage impact. The IEA Guidelines
suggest that two broad rules can be used as a screening process to delimit the scale and extent of the assessment, these being:

- Rule 1 - Include Highway Links where traffic flows would increase by more than 30% (or the number of Heavy Goods Vehicles will increase by more than 30%); and
- Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more

6.39 The IEA guidelines are intended for assessment of environmental impact of road traffic associated with major new developments. Where the predicted increase in traffic volume, general traffic or HGV traffic only, is lower than these thresholds, effects can be stated as not significant, meaning that further detailed assessments are not required. Additionally, at a basic level, it should be assumed that projected changes in traffic of less than 10% create no discernible environmental impact as a result of day-to-day variation of traffic on a road is frequently as least + or – 10%.

6.40 The transport routes to be used by the Development are set out in the TA and comprise the routes which pass through the three junctions defining the study area. These include Salhouse Road, Plumstead Road and the future aspirational link road. Quantitative and qualitative assessments and audits have been undertaken to determine if the effects are considered significant. The predicted significance of the impact was determined through a standard method of assessment based on professional judgement, considering both the sensitivity and magnitude of change.

6.41 The assessment of significance takes into consideration the mitigation measures that will be implemented to reduce the effect of the Development. Therefore, the assessment provides the significance of effect of the Development with relevant mitigation measures in place.

6.42 The assessment of the transport effects of a development is guided by criteria of impact and receptor sensitivity. The question of the significance of an effect depends on both the sensitivity of the receptor (e.g. junction, transport route or transport user) and the degree to which the receptor would be affected (i.e. extent of impact).

6.43 In accordance with accepted modelling practices, it is considered that junctions are operating within capacity if Ratio of Flow to Capacity traffic modelling results are less than 1.0 and/or Degree of Saturation results are less than 100%. The traffic impact of the Development is considered to be minor if all junctions on the local network operate within the aforementioned thresholds in the various forecast scenarios.
Baseline Surveys

6.44 The traffic surveys used in this assessment were carried out in July 2013. Appropriate traffic growth factors were calculated and applied to the 2013 traffic data to generate appropriate traffic flow estimates for future conditions. These traffic growth factors were calculated using TEMPRO 70 and NTM AF15 datasets for urban minor routes in the area Broadland 013 (EO2005532) and resultant growth factors are presented in Table 6.6 below:

### Table 6.6: TEMPRO Growth Factors

<table>
<thead>
<tr>
<th>Period</th>
<th>2013 to 2016</th>
<th>2016 to 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekday AM Peak Period</td>
<td>0.9937</td>
<td>1.0943</td>
</tr>
<tr>
<td>Weekday PM Peak Period</td>
<td>1.0018</td>
<td>1.0988</td>
</tr>
</tbody>
</table>

Limitations and Assumptions

6.45 The transport-related assessment focuses on modelling and auditing of walking, cycling and public transport routes and general vehicular routes and junctions in the vicinity of the Site and the surrounding area.

6.46 Future forecast traffic modelling process is dependant in the first instance on projected traffic data. Where this data is subject to day-to-day changes/fluctuations, this may affect the results of the modelling process.

6.47 NCC (as the local Highway Authority) does not require a specific assessment of footway and cycle way capacity. For effects such as this, there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor.

Baseline Conditions

6.48 The Site is located on the edge of the built-up area of Norwich, adjacent to established residential communities to the south and west, and the village of Thorpe End to the East. It is, therefore, well located in relation to a wide range of local amenities including primary and secondary schools, retail, recreation, health and public transport services, which are all accessible on foot.

6.49 The nearest formal cycling provision to the Site is a cycle path which runs adjacent to Dussindale Drive on its eastern side from the junction with Plumstead Road East, South into the residential neighbourhood of Dussindale. This is an off-road path which is segregated.
from the carriageway by a grass verge and footway, offering a traffic-free cycle route which is likely to appeal to all ages and abilities.

6.50 There is significant planned investment in cycling across Norwich, in particular for the creation of seven key cycle routes known as 'pedalways'. The first of these, an 8-mile cross-city route known as the pink pedalway, runs from the Norfolk & Norwich University Hospital and UEA to the West, through the city centre, to Heartsease and Broadland to the East. This route provides connections from Woodside Road, to the West of the Development, into the city centre.

6.51 Other nearby pedalways include the Bowthorpe to Broadland Business Park green pedalway which runs along Laundry Lane to the south of the Site, and the purple Outer Circuit pedalway which runs through Heartsease to the west of the Site.

6.52 Cycling is likely to be a suitable mode choice for trips from the Development to destinations within approximately 6.4km, or around a 20 minute ride, from the Site.

6.53 Salhouse Road is a major arterial route connecting employment and retail areas within Norwich with the villages of Salhouse and Rackheath. It is also a proposed Bus Rapid Transit (BRT) corridor in the Norwich Area Transportation Strategy and also the Greater Norwich Infrastructure Plan.

6.54 To the Northeast of Thorpe End, the Northern Distributor Route (NDR) is currently being constructed. The NDR will provide a strategic highway connection between Postwick Junction to the South, and the A1067 to the Northwest. The NDR is being provided alongside a package of measures in Norwich city centre which will remove through movements and thereby relieve key arterial routes into the city. Salhouse Road is one such road which is forecast to be subject to a reduction in traffic as a result of the NDR being brought forward.

6.55 The assessment has considered the accessibility of the Site by all modes of transport, and has assessed the impact and mitigation measures where required in accordance with the appropriate guidance and agreed scope.

6.56 The traffic surveys used in this analysis were carried out in July 2013. Appropriate traffic growth factors were calculated and applied to the 2013 traffic data to generate appropriate traffic flow estimates for 2016 and 2021. Traffic modelling results are dependent on the growth factors included in Table 6.2 for the projected future traffic data.
Likely Significant Effects

Construction Phase

6.57 Consideration must be given to the effects of construction traffic on the existing residents in the vicinity of the Site who may be adversely affected by construction traffic related to the Development.

6.58 Construction traffic and access impacts can include:

- Increased construction traffic volumes on the local road network;
- Traffic signal and pedestrian/cyclist control at construction traffic access point(s);
- Increased noise levels on the Site due to construction activities, plant and road haulage vehicles*;
- Increased noise levels caused by any ground treatment*; and
- Increased noise levels off-site due to road haulage* vehicles.

* assessed in Chapter 7 - Noise

6.59 Based on experience of other similar scale and types of projects in and around Norwich, it is estimated that the construction phase will generate up to a total of 80 two-way passenger car trips per full working day. It is envisaged that there will also be up to an additional 40 LGV/HGV two-way trips a day at the peak of construction.

6.60 Considering other recent, local residential projects, the rate of construction is anticipated to average approximately 40 dwellings per year and, therefore with a provisional start date of 2018, the scheme is estimated to be complete circa 2027.

6.61 The levels of additional traffic outlined above will be minimal against the backdrop of existing traffic flows on the highway network, however, without appropriate management of construction traffic these impacts would be more marked.

Table 6.7: Significance of Effects

<table>
<thead>
<tr>
<th>Mode</th>
<th>Impact</th>
<th>Significance of Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>Additional traffic movement to/from construction site.</td>
<td>Minor Adverse</td>
</tr>
<tr>
<td>HGV/LGV</td>
<td>Introduction of additional large construction vehicles</td>
<td>Minor Adverse</td>
</tr>
</tbody>
</table>
Operational Phase

6.62 The principal point of access to the Site will be taken from Salhouse Road on the north western edge of the site. This access will take the form of a new signalised junction which will enable the provision of bus priority measures along Salhouse Road in future.

6.63 From this new access junction, a route into the site will be provided from Salhouse Road. It is anticipated that this route could be extended in future by other parties to connect with the proposed new roundabout on Plumstead Road as part of the full orbital link road around the north-east of Norwich.

6.64 A secondary point of access to the Site will be provided for pedestrians, cyclists and emergency vehicles to the south joining Plumstead Road adjacent to the junction with Heath Road and Green Lane North. The details of this arrangement will be agreed with NCC during the consideration of the reserved matters application. This route will be converted to a pedestrian and cyclist-only path in future, once the through-route for vehicles to the proposed new roundabout on Plumstead Road has been provided by others.

6.65 There is also the option to provide additional points of access to the east and west of the Site that would offer extra connectivity into the neighbouring development sites, which include further residential development and community facilities such as a proposed new primary school. These connections would be supplementary to the Site access requirements, but, would cater for local pedestrian and cycle movements, as well as potentially some vehicular movements. They would offer good permeability through the whole development area and high levels of integration between the new residential communities.

6.66 The potential impact of development-generated traffic (i.e. operational traffic) has been assessed and the results of the assessment can be seen in Table 6.8 below.

### Table 6.8: Development Vehicular Traffic Generation (380 dwellings)

<table>
<thead>
<tr>
<th>Unmitigated</th>
<th>AM Peak (08:00-09:00)</th>
<th>PM Peak (17:00-18:00)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arrivals</td>
<td>Departures</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>119</td>
</tr>
</tbody>
</table>

6.67 The suite of traffic flow diagrams (Figures 6.1-6.12) accompanying this Chapter highlight percentage changes of traffic impacts on the local highway network arising from the Development over forecast conditions. According to the Manual of Environmental Appraisal (MEA) thresholds, all impacts arising from the Development are either minor or moderate adverse with the maximum impact on any identified link arising from the scheme being less...
than 20%, with all main road links remaining well within maximum theoretical operating capacity. The impact of the Development would be significantly reduced further still with the completion of the road between Salhouse Road and Plumstead Road being less than 10% on any particular link.

6.68 In accordance with the IEA Guidelines (1993), existing footways and cycleways have been reviewed. Applying professional judgement, our assessment is that there would remain sufficient capacity to readily accommodate the additional trips by these modes and the local routes would remain fully functional. This is based on evidence obtained from the surrounding area whereby footways and cycleways have been assessed as being suitable to accommodate two-way flows of pedestrians and cyclists unhindered.

6.69 The assessment criteria are based on prescribed footway and cycleway widths given in the Manual for Streets 1&2\(^1\) and Highway Authority standards which, in this case, are satisfied.

6.70 It should be noted that in combination, peak period pedestrian and cyclist flows arising from the Development would be in the order of up to two movements per minute and would not pose any significant issues for existing footway and cycleway capacity in the various forecast scenarios.

6.71 The number and frequency of bus services will be increased and services improved in the local area on an account of programed BRT initiatives. Applying professional judgement, based on on-site observations and correspondence with local bus operators, our assessment is that there would remain sufficient capacity to readily accommodate the additional trips by this mode. The additional demand for bus travel would support the contained operation and potentially lead to further increased service provision. Given the relatively limited demand for rail travel an assessment of rail capacity has not been considered as agreed with the Highway Authority.

6.72 The primary access will be in the form of a new traffic signal controlled junction designed in accordance with the DMRB standards with a Type 2 road from the southern arm of the junction leading into the Site.

### Table 6.9: Significance of Effects

<table>
<thead>
<tr>
<th>Mode</th>
<th>Impact</th>
<th>Significance of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Increased use of pedestrian network</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>Increased use on highway crossing facilities</td>
<td></td>
</tr>
<tr>
<td>Cycling</td>
<td>Increased use of local highway and cycling facilities</td>
<td>Negligible</td>
</tr>
<tr>
<td>Mode</td>
<td>Impact</td>
<td>Significance of Effect</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Public Transport (Bus)</td>
<td>Increased patronage, use of bus facilities and services</td>
<td>Negligible</td>
</tr>
<tr>
<td>Highways</td>
<td>Increased use of network Increase in vehicles at localised junctions</td>
<td>Minor Adverse</td>
</tr>
</tbody>
</table>

**Mitigation Measures**

6.73 The key objective of mitigation is to avoid, offset or reduce the significant adverse effects of the Development. Mitigation can be through design or management, and the strategy should be informed by the following hierarchy of options:

- Avoidance;
- Reduction;
- Compensation;
- Remediation; or
- Enhancement.

*Construction Phase*

6.74 The impact of construction traffic on local roads is likely to be of particular concern to residents who live in the vicinity of the Site and/or along those agreed construction traffic routes to/from the proposed development. Therefore, it is important to ensure that any adverse effects are limited as far as is reasonably possible.

6.75 Construction traffic consists of the delivery of equipment and materials, and the movement of excavated materials to/from the Site.

6.76 Potentially significant impacts during the construction phase are associated with noise generating activities adjacent to potentially sensitive receptors. By employing appropriate construction site management practices, the potential for adverse traffic impacts from construction vehicles and plant during the works will be minimised.

6.77 A range of measures are suggested, which ultimately can form part of a site-specific Construction Environmental Management Plan (CEMP), or similar, that will provide a framework for all contractors’ activities. The CEMP itself could be secured by condition of planning permission. Further information on the CEMP is included within Chapter 5: Construction Methodology and Programme.
6.78 Prior to any construction activity on the Site, a detailed CEMP will be drawn up and agreed with the contractor, BDC and the Highway Authority to set out the appropriate construction management practices to be adhered to (as also outlined in Chapter 5 of this submission) and will cover the following transport-related matters:

- Methods and materials that should be used to ensure that the generation of construction traffic is minimised;
- Regarding optimum layout, construction traffic generating activities to be located away from sensitive receptors where possible; and
- Good housekeeping and management, i.e.
  - Review of plant and activities to ensure traffic generation minimization measures are in place and operating;
  - Public relations, e.g. provision of telephone numbers for complaints, pre-warning of more intensive traffic generation and access activities (e.g. traffic control), sensitive working hours;
  - Controlling of construction traffic and setting up of access routes away from sensitive receptors; and
  - Provisions of traffic generation monitoring.

6.79 The contractor will be responsible for the execution of the CEMP and will ensure that appropriate personnel understand their responsibilities in terms of the minimisation of noise and the appropriate reporting of incidents. They will also be responsible for identifying and organising appropriate training.

6.80 Mitigation measures will include the following where possible:

- Regular monitoring where the potential for significant noise is identified;
- Restriction of working hours on the Site (see Chapter 5: Construction Methodology & Programme);
- Where vehicles are standing for a significant period of time, engines to be switched off to reduce fuel consumption and noise;
- Plant to operate at low speeds where possible with respect to safety, and to incorporate automatic low speed idling;
- Routing of construction traffic onto the most suitable roads in agreement with BDC;
- Location of construction haul roads, entrances and exits to prevent the need for vehicles to reverse onto the highway and minimise impact on the local road network;
Consideration to be given to temporary screening or enclosures for static noisy plant to reduce noise emissions and plant should be certified to meet any relevant European Commission Directive Standards; and

All contractors to be made familiar with the guidance in BS 5228 (Parts 1 and 2) which should form a pre-requisite of their appointment; and

Early and good public relations with the adjacent tenants and occupants of buildings will also reduce the likelihood of complaints.

6.81 As a result, the impact of construction vehicles on existing traffic flows and the local roads network, considering the Development in both isolation and cumulatively, is considered likely to be Negligible.

Operational Phase

6.82 In order to mitigate adverse effects of the completed Development, the measures shown in Table 6.10 (along with their source) will be implemented.

Table 6.10: Mitigation Measures (Completed Development)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Travel Plan Co-ordinator</td>
</tr>
<tr>
<td></td>
<td>Welcome Packs, web-site and notice boards</td>
</tr>
<tr>
<td>Cycling</td>
<td>Travel Plan Co-ordinator</td>
</tr>
<tr>
<td></td>
<td>Welcome Packs, web-site and notice boards</td>
</tr>
<tr>
<td>Public Transport</td>
<td>Subsidised Bus Travel</td>
</tr>
<tr>
<td>(Bus)</td>
<td>Welcome Packs, web-site and notice boards</td>
</tr>
<tr>
<td>Highways</td>
<td>Main Site Access (Salhouse Road) Traffic Signal Junction</td>
</tr>
<tr>
<td></td>
<td>Lift sharing</td>
</tr>
<tr>
<td></td>
<td>Travel Plan Co-ordinator</td>
</tr>
</tbody>
</table>

6.83 As referenced in Table 6.10, a comprehensive Travel Plan will be implemented as part of the Development. This is a major component of the overall mitigation package. In addition to assisting in achieving Central Government aims and objectives, the Travel Plan will have a number of benefits to individuals and the local community as well as the Site, such as:

- An improvement in the environmental image of the Site;
- A reduced need for car parking spaces;
- Improved access to the Sites for residents, visitors and deliveries;
- Reduced traffic generation resulting in improved air quality, noise levels, local traffic conditions and a cleaner more attractive environment;
- Reduce the number of trips by private vehicle, especially those of single occupancy cars;
- Reduced stress caused by driving, allied with improved health from adopting alternative travel habits;
- Enhancement of the role of safe walking and cycling in the local area and therefore an improved environment for all pedestrians and cyclists;
- Improved viability and therefore provision of local public transport services, which are available to those travelling to and from the Sites as well as the rest of the local community; and
- A reviewable operation so that any adverse transport impact can be quickly dealt with and emerging opportunities maximised.

Residual Effects

Construction Phase

6.84 Through the implementation of a suitable CEMP, the significance of the predicted effects of construction traffic arising from the construction phases of the Development would be Negligible in nature.

6.85 It is considered that appropriate mitigation will be undertaken during construction of the Development to mitigate any significant impacts which may arise as a result of the Development. It is therefore considered that there will not be any significant adverse Transport and Access impacts during the construction phase.

Operational Phase

6.86 It is expected that with mitigation in place there would be no significantly detrimental Transport and Access impacts arising as a result of the operation of the Development. At worst, the residual effects are anticipated to be Minor Adverse.

Cumulative Effects

6.87 As agreed in advance with the Highway Authority (NCC), the traffic impact of the built/occupied Development has been assessed, including testing reviews of full future year operation:

- 2021 “background” traffic for the weekday AM and PM peak hour;
- 2021 “background” traffic plus the Development traffic (in full) for the weekday AM and PM peak hour.
6.88 The methodology and results of the aforementioned assessment scenarios are presented in full in the accompanying TA. Traffic data from 2013 is converted to 2021 “background” using “TEMPO” based factors which take into account forecast changes in car ownership, trip length and general growth in houses and employment. The Development traffic is added to the 2021 “background” such that the full impact of the scheme can be appropriately assessed. A full description of the background growth and trip generation for the Development are included in the TA.

6.89 The suite of traffic flow diagrams accompanying this chapter highlight percentage changes of traffic impacts on the local highway network arising from the Development over baseline conditions. According to the MEA thresholds, all impacts arising from the cumulative effects are minor adverse.

6.90 As a result of assessing the cumulative traffic impacts mitigation measures will include:

- Main Site Access (Salhouse Road) Traffic Signal Junction

6.91 With respect to walking, cycling and public transport, the same conclusions are reached as referenced in the preceding operational phase section of this chapter.

Committed Developments

6.92 Information on the committed developments assessed within the ES are included in Chapter 2 (EIA Methodology).

6.93 The Transport Assessment-related work for planning applications 20160498 and 20160499 produced by Peter Brett Associates (PBA) takes into consideration development of the Site referred to directly in this chapter of the ES as part of wider residential masterplanning in this area of Norwich in accordance with GT7. Conclusions are drawn in PBA’s reporting with respect to appropriate mitigation measures to enable GT7 to come forward (inclusive of the Development considered directly herein). These include provision of new footway infrastructure on Salhouse Road, speed limit reduction, the formation of new vehicular access points and comprehensive Travel Planning.

Operational Phase

6.94 Cumulative traffic impacts associated with the Development and those neighbouring schemes to the Site will be minimised by the mitigation measures referred to above. This
will ensure that, even with increased traffic arising and trip generation arising from the Development, impact on the local road network will only be of marginal significance at worst and all junctions modelled in the TA should continue to operate within acceptable theoretical capacity with the introduction of the appropriate mitigation measures including Travel Planning, for example. Consequently, the overall impact is anticipated to be at worst, Minor Adverse.

**Summary**

6.95 The Site considered is suitable for the Development subject to the implementation of the mitigation measures outlined above.

6.96 For future residents and visitors, there will be improved pedestrian and cycle links between the Development and existing facilities in this area of Greater Norwich, capitalising on the Site’s sustainable location.

6.97 The Site is within walking distance of existing bus routes which offer regular services to/from Norwich city centre. Details of the local bus services are described in the main TA and accompanying Travel Plan.

6.98 Trip generation for the Development utilises trip rates agreed with the Highway Authority. It should be noted, however, that those trip rates applied have not been adjusted for the potential success of the Travel Plan which will be implemented and therefore, provide a “worst-case” assessment.

6.99 The worst-case trip rates suggest that in the order of 177 peak hour vehicular trips could be generated by the Development during the AM peak with some 147 vehicular trips in the PM peak hour periods.

6.100 The anticipated Development-generated traffic has been distributed and subsequently tested across the local highway network at 2021 using ARCADY and LinSig. With the introduction of the Development and associated mitigation measures detailed herein, the local highway network would continue to operate in a satisfactory manner.

6.101 It is unlikely that the Development would give rise to any significant safety issues on the local highway network. It should be noted that the proposed access arrangements would be subject to road safety audit(s).
6.102 It is considered that there are no transport-related grounds preventing the Development from being delivered subject to the mitigation measures proposed.

6.103 Table 6.11 presented below contains a summary of the likely significant transport-related effects of the Development.
<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Nature of Effect (Permanent/Temporary)</th>
<th>Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)</th>
<th>Mitigation / Enhancement Measures</th>
<th>Geographical Importance*</th>
<th>Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td>Temporary</td>
<td>Minor Adverse</td>
<td>CEMP (or similar)</td>
<td></td>
<td>* Negligible</td>
</tr>
<tr>
<td>Activities</td>
<td>Temporary</td>
<td>Minor Adverse</td>
<td>CEMP (or similar)</td>
<td></td>
<td>* Negligible</td>
</tr>
<tr>
<td><strong>Completed Development</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td>Permanent</td>
<td>Minor Adverse</td>
<td>Travel Plan, Highway Access</td>
<td></td>
<td>* Minor Adverse</td>
</tr>
<tr>
<td>Activities</td>
<td>Permanent</td>
<td>Minor Adverse</td>
<td>Travel Plan, Highway Access</td>
<td></td>
<td>* Minor Adverse</td>
</tr>
<tr>
<td><strong>Cumulative Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td>Temporary</td>
<td>Minor Adverse</td>
<td>Travel Plan</td>
<td></td>
<td>* Minor Adverse</td>
</tr>
<tr>
<td>Activities</td>
<td>Temporary</td>
<td>Minor Adverse</td>
<td>Travel Plan</td>
<td></td>
<td>* Minor Adverse</td>
</tr>
</tbody>
</table>

* Geographical Level of Importance

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local
References

1. DCLG (2012); *National Planning Policy Framework*
4. Norfolk County Council, Joint Core Strategy for Broadland, Norwich and South Norfolk, January 2014
8. Institute of Environmental Assessment (1993); *Guidelines for the Environmental Assessment of Road Traffic*