

# Land North and West of Hethersett

Transport Appraisal

December 2018

## Quality information

Prepared by



G Whitehead  
Senior Consultant

Checked by



B. Carey  
Associate Director

Approved by



N. Anderson  
Regional Director

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Prepared for:

Pigeon Land 2 Ltd

Prepared by:

AECOM Limited  
Cavell House  
Stannard Place  
St Crispins Road  
Norwich  
NR3 1YE  
aecom.com

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Executive  
Summary

01

## 1. Executive Summary

AECOM have been appointed by Pigeon Land 2 Ltd 'Pigeon' to provide transport planning advice for a high quality mixed use sustainable scheme on land North and West of Hethersett. The concept scheme includes provision for up to 1,000 new homes, employment area for B1/B8 use classes, a new Education and Sports Campus for a 2 FE primary school and pre-school and a site for a Key Stage 3 campus, green infrastructure and extensive areas of amenity space.

Access to the site is proposed from a number of locations off Great Melton Road, Little Melton Road, Burnthouse Lane and Colney Lane.

The site has good connectivity and links to a number existing facilities and amenities within Hethersett and the surrounding area via sustainable modes of travel. The majority of key facilities and amenities are located within reasonable walking or cycling distance along existing, and proposed routes conducive to both modes.

There are a number of proposed improvements to the highway network to encourage and promote sustainable travel, these include the following;

- Norfolk County Council (NCC) are providing a cycle route along Colney Lane / Hethersett Lane to the A47 overbridge, after which it will be continued as part of the mitigation package for Norwich Research Park (NRP);
- Blue Pedalway connecting Hethersett to Sprowston via Norwich city centre to the east, and to Wymondham to the west, currently under construction;
- A Bus Rapid Transit (BRT) route along Norwich Road and via Hethersett; and
- A clean route for enhancing sustainable modes along Norwich Road as part of the Transforming Cities Fund which will provide access through employment areas such as UEA, NNUH and NRP.

The scheme will be designed to encourage high sustainable transport mode shares given the local facilities available. Given the links to sustainable modes of transport, the use of the private car should not be the first mode of choice for residents of the development therefore limiting the effect of the development on nearby junctions.

The recently improved B1135 Tuttlés Road East / Norwich Road / Norwich Common four-arm roundabout is a local network constraint which may require some form of signalisation to manage future traffic movements, but it is not anticipated to present a constraint.

The Thickthorn Interchange between A11 and A47 is a long standing local network constraint which will be addressed as part of a major scheme being delivered by Highways England. This junction is not anticipated to present a constraint.

The B1172 Norwich Road / Colney Lane junction is proposed to be signalised as part of the Hethersett North Development. Reducing traffic demand by targeting a lower car driver mode share in the area through supporting sustainable travel options would help to improve the junction operation.

The B1108 Watton Road / Hethersett Lane junction has already been signalised as part of the Norwich Research Park Expansion. This junction is not anticipated to be a constraint.

It is anticipated that the following enhancements could be provided as part of the scheme:

- Improvements to the pedestrian and cycle network within Hethersett;
- Provision of enhanced cycle and pedestrian facilities and infrastructure;
- Provision of enhanced bus services and infrastructure;
- Provision of additional bus stops;
- Provision of enhanced facilities at nearby bus stops;
- Investment in additional cycle parking at Thickthorn Park & Ride;

- Implementation of a Travel Plan for all aspects of the proposed scheme which could include the below measures to promote sustainable travel modes;
  - Promotion of car/ lift sharing;
  - Provision of a car club;
  - Promotion of electric bikes;
  - Travel Information Welcome Packs (to include sustainable transport information); and
  - Community Notice Board (to include sustainable transport information).
- Investment in local travel planning in the nearby residential areas to support generalised mode shift in Hethersett;
- Potential contribution towards signalisation of the B1135 Tuttle Road East / Norwich Road / Norwich Common four-arm roundabout;
- Little Melton / Burnthouse Lane Priority T Junction visibility improvements;
- Traffic calming in Little Melton and surrounding the Melton Road / Mill Road / School Lane / Burnthouse Lane Crossroads; and
- Potential mitigation at the priority T-junction at B1172 Norwich Road / Churchfields, which may be in the form of signalisation.

In summary, the proposed scheme is deliverable in terms of transportation and offers a significant opportunity to provide new homes, education facilities and green infrastructure in a sustainable location which is accessible by sustainable modes to the existing nearby facilities and amenities and to key employment centres, including UEA, NNUH and NRP.

Introduction

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## 2. Introduction

### 2.1 Background

AECOM have been appointed by Pigeon Land 2 Ltd 'Pigeon' to provide transport planning advice in relation to a site, known as the 'Land north and west of Hethersett' (reference GNLP0177-A), submitted as part of the Call for Sites for the Greater Norwich Local Plan (GNLP).

Following submission to the call for sites, the site was reviewed as part of the Housing and Economic Land Availability Assessment (HELAA) and considered to be 'suitable'. As part of the consultation process which follows the HELAA, further evidence regarding the site is being provided to demonstrate the site's suitability to accommodate new homes and jobs, community and education facilities, strategic landscaping and extensive public space as part of a high quality scheme.

This report sets out to assess the site's suitability in terms of connectivity to the existing walking, cycling and public transport facilities as well as local amenities and facilities. Further to this, access locations to the site and the likely capacity of the junctions in the vicinity of the site have been reviewed to assess the deliverability of the scheme in transport terms.

### 2.2 Consented Developments

#### Hethersett North Development

Hethersett North (planning ref: 2011/1804) is a residential led mixed use development of 1,196 dwellings, community facilities including a primary school, expansion of the local secondary school, two local village centres, GP facilities, parkland, football pitches, allotments and children's play areas. It is located to the north of the existing settlement area.

The development was granted outline planning approval by South Norfolk Council in 2013 and is currently being constructed. It is proposed to be delivered over five phases with completion expected by 2025.

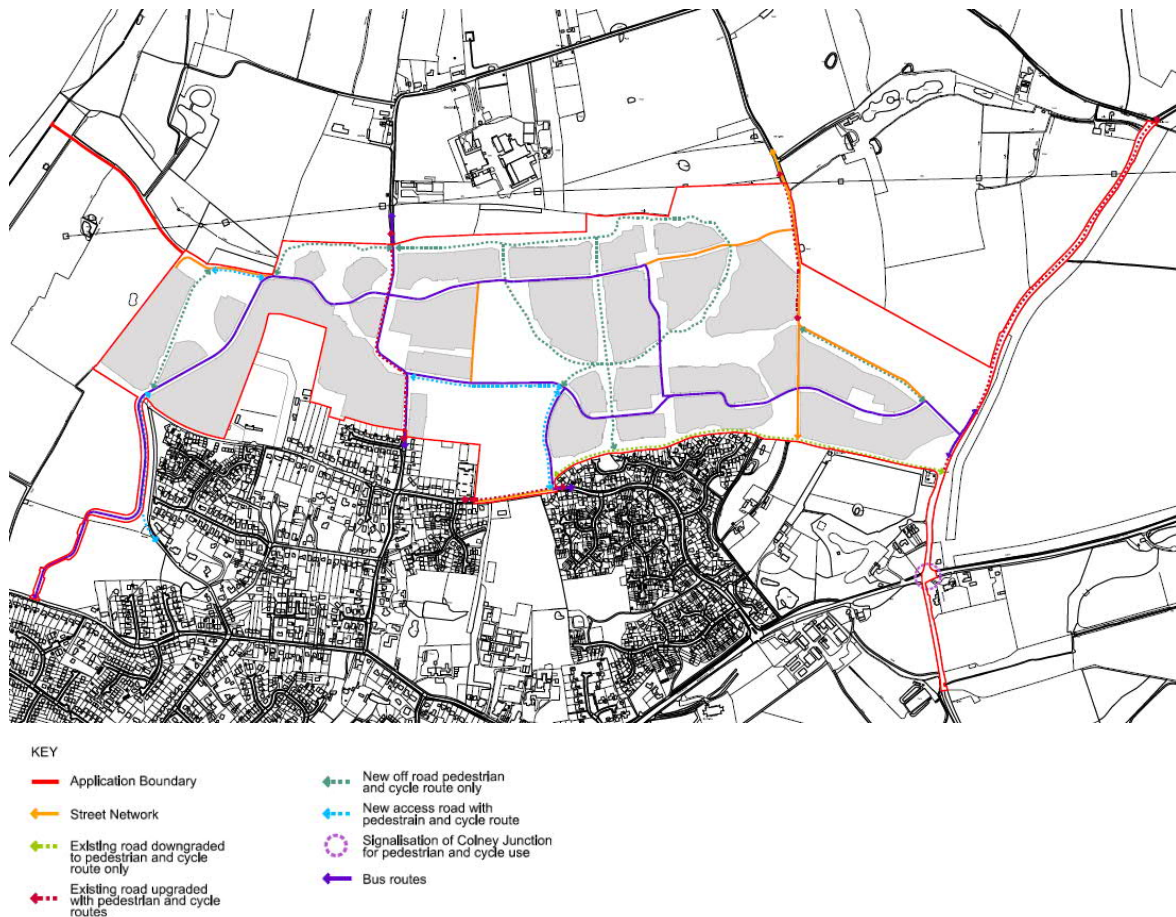
A summary of the development proposals as set out in the Transport Assessment, are summarised below:

- A new shared footway / cycleway facility provided along Colney Lane between its junctions with Burnthouse Lane and Braymeadow Lane;
- Downgrading of Back Lane and Shop Lane to a pedestrian and cycle link;
- Detailed bus strategy with a number of routes diverting through the site to ensure all areas of the development will be located within 400 metres of bus stops (the five northern bus stops are new as part of this development as shown on Figure 2);
- Traffic calming / shared-space improvements to Little Melton Road within the site to deter rat-running;
- Traffic calming / shared-space improvements on Henstead Road and Back Lane west of Churchfields;
- Provision of a spine road through the development;
- Contribution toward improvements at the B1108 Watton Road junction with Hethersett Lane;
- Provision of a signalised junction at Colney Lane/B1172, including a cycle lane on the eastern side of Colney Lane arm;
- Provision of land for a 250 space extension to the Thickthorn Park & Ride site and a new dedicated slip-road access to the site from the northbound A11. This does not form part of the specific mitigation proposed for Hethersett North but will be facilitated by the development in the form of a contribution towards the wider JCS aspirations for the junction;
- Vehicular accesses to be provided at the following locations:
  - New priority junction with Colney Lane to the eastern boundary of the site which will provide the principal access point for the development. This junction includes a ghost island right turn lane to accommodate a higher volume of traffic;

- New access junction with Churchfields and Back Lane to the southern boundary of the site;
- Little Melton Road in the centre of the site; and
- Access via the Heathfields development onto Great Melton Road.

Figure 1 below illustrates the Hethersett North movement and access strategy for pedestrian, cyclists and buses.

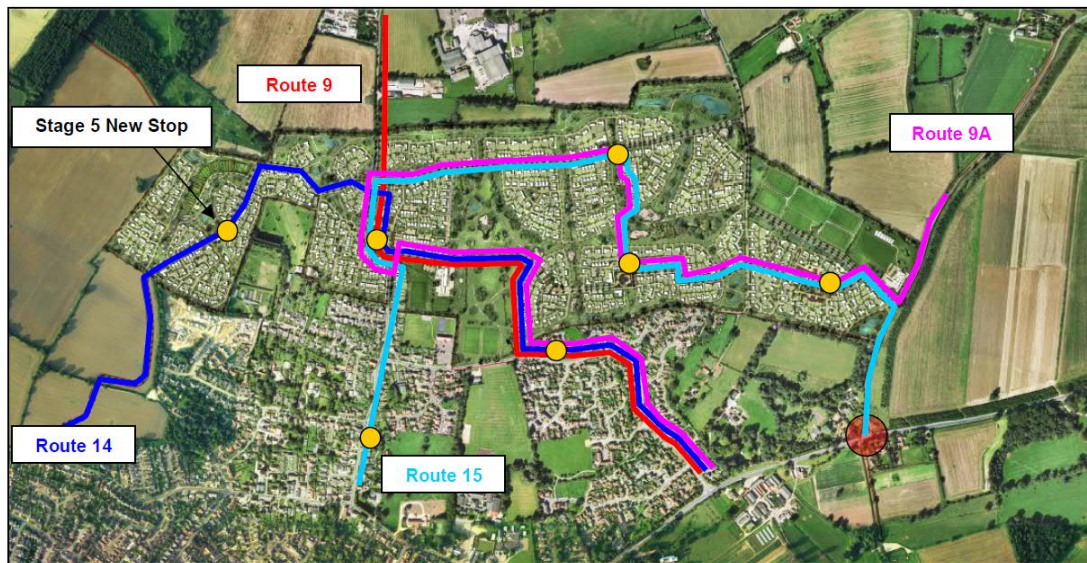
Figure 1. Hethersett North, Movement and Access Strategy – Pedestrian, Cycle and Bus



Source: Hethersett North Transport Assessment

Figure 2 below shows the proposed Bus Strategy for the site, as set out in the Transport Assessment.

Figure 2. Hethersett North, Proposed Bus Strategy



Source: Hethersett North Transport Assessment

### Heathfields Development

The Heathfields development (planning ref: 2011/1804) includes for 151 dwellings located to the west of Hethersett with access provided from Great Melton Road, approximately 55 metres from the junction of Great Melton Road / New Road.

It is understood that the last few homes to the east are still being constructed. All homes have been sold and the development is nearing completion.

Based on the Transport Assessment prepared for the development, it is understood that the development proposals included for the following:

- A two metre footway on the southern side of Great Melton Road to tie into the existing footway to the east of the site and to be extended west for approximately 26.5 metres to the west of the site access (provided);
- A two metre footway on the northern side of Great Melton Road for the same distance as the southern footway (provided);
- Dropped crossing with tactile paving at either end of the proposed footway extent (provided);
- Provision of a pedestrian link through Cedar Road;
- Install lighting and improve footway surfacing along the public right of way; and
- Facilitate a vehicular connection to the north for the Hethersett North development to connect through the site (provided).

## 2.3 Report Structure

The remaining sections of this report are set out as follows:

- Section Three provides a brief description of the existing site and the relevant consented schemes in the vicinity of the site;
- Section Four sets out a review of the sustainable transport network, including the existing and future facilities proposed as part of the consented developments, for pedestrians, cyclists and public transport users;

- Section Five sets out a review of the accident history on the local highway network in the vicinity of the site;
- Section Six sets out the proposed scheme details and proposed access strategy;
- Section Seven describes the methodology undertaken to estimate traffic generation for the proposed site and provides the likely distribution of vehicular trips;
- Section Eight provides a review of the potential operation of the junctions on the surrounding highway network and identifies potential highway network improvements where likely to be required.
- Section Nine provides a review of the potential mitigation requirements associated with the proposed scheme; and
- Section Ten provides a summary and conclusion of the report.

# Site Location and Description

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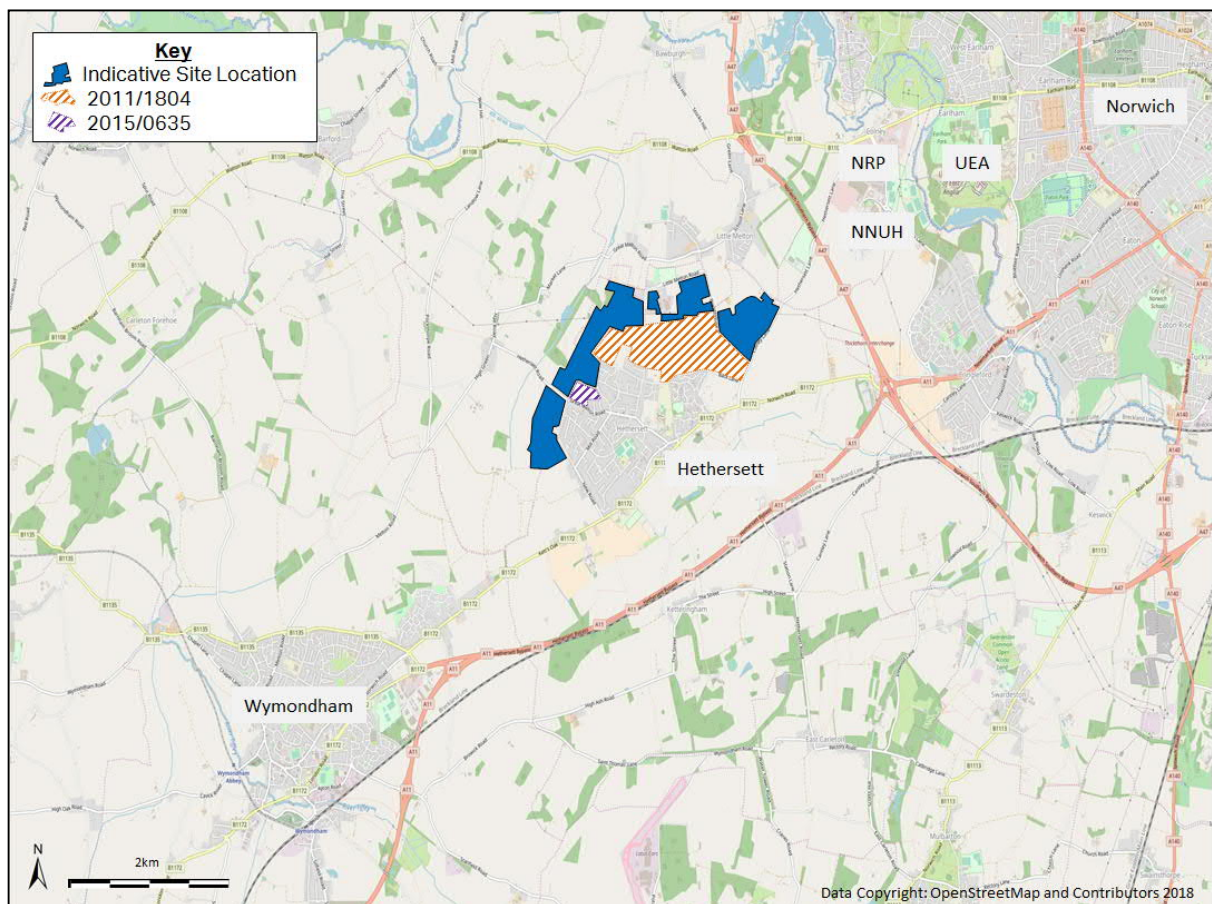
### 3. Site Location and Description

#### 3.1 Site Location and Description

The development site covers some 111ha of land which is currently used for agricultural purposes. Due to the agricultural nature of the land, there are a number of informal accesses provided from Great Melton Road, New Road, Little Melton Road, Burnthouse Lane and Colney Lane. The site itself is relatively flat in terms of topography.

The site wraps around the existing village of Hethersett to the west and north and forms a natural extension of Hethersett and the Hethersett North Development currently under construction. As discussed in the previous chapter, the site is adjacent to two consented development sites which are currently being constructed for the purposes of providing some 1,196 homes under planning permission 2011/1804 and 151 homes under planning permission 2015/0635. Further details of these developments are provided in the below sections. The site location, along with the consented development locations are illustrated on Figure 3 below.

Figure 3. Site Location



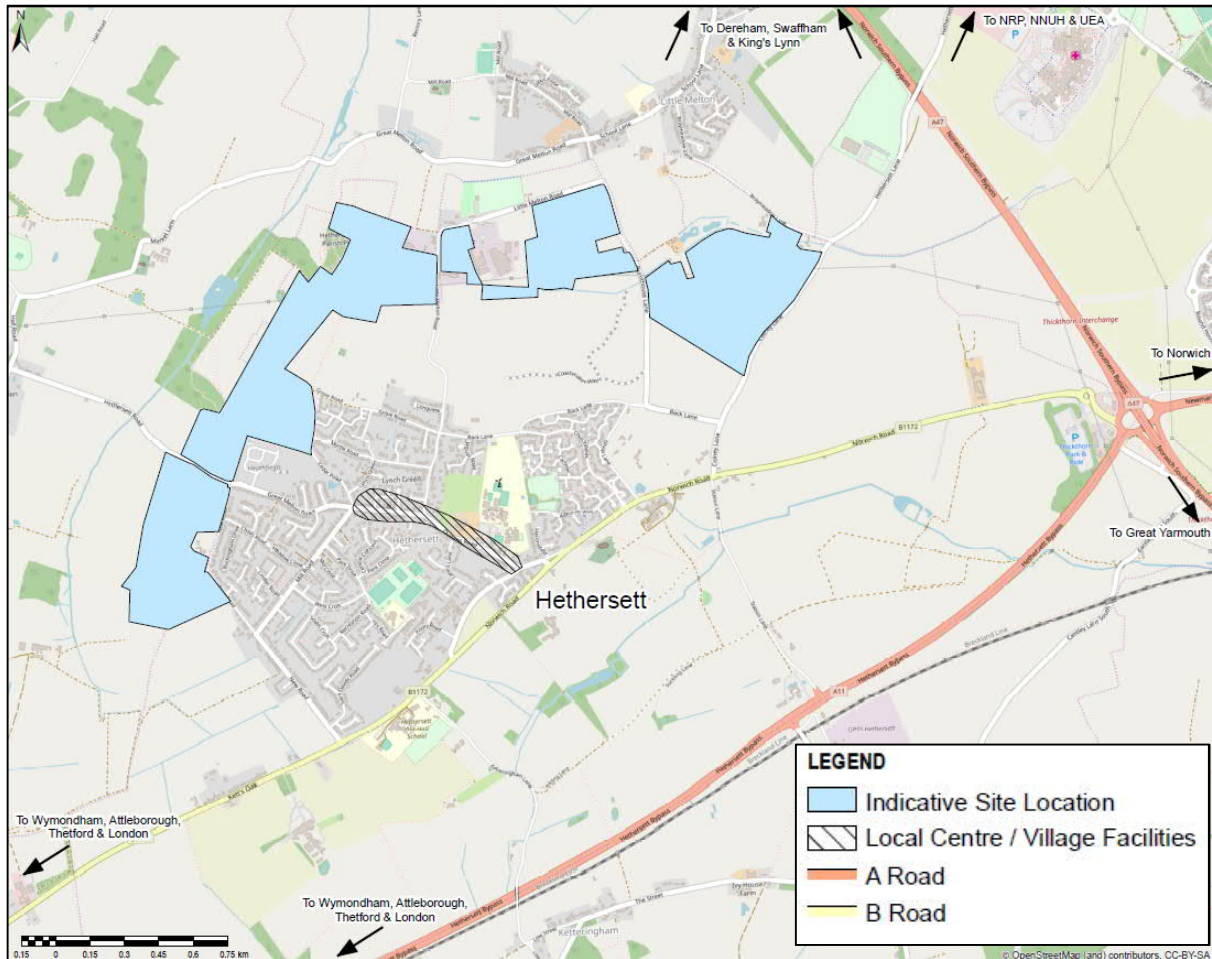
The proposed scheme details are set out in Chapter 6.

The site is situated such that a number of vehicular routes are available to the north, east and west to access both the A11 and A47.

The B1172 Norwich Road sited to the south of Hethersett, which provides vehicular access to the village, connects with Colney Lane as well as Churchfields and New Road which links to Great Melton Road, Little Melton Road, and Burnthouse Lane. The B1172 Norwich Road also provides access to the A11 at Thickthorn Interchange.

The A11 is a Trunk Road which provides the key route between Norwich and Cambridge, the Midlands and south towards London. The A11 also connects with the A47 which serves Lowestoft, Great Yarmouth, King's Lynn and Peterborough. This provides opportunities for traffic from the site to be diluted across the highway network to access the different strategic road networks. Figure 4 below illustrates the existing local and strategic highway network in the vicinity of the site.

Figure 4. Highway Network



Sustainable  
Transport Network  
Review

04



## 4. Sustainable Transport Network Review

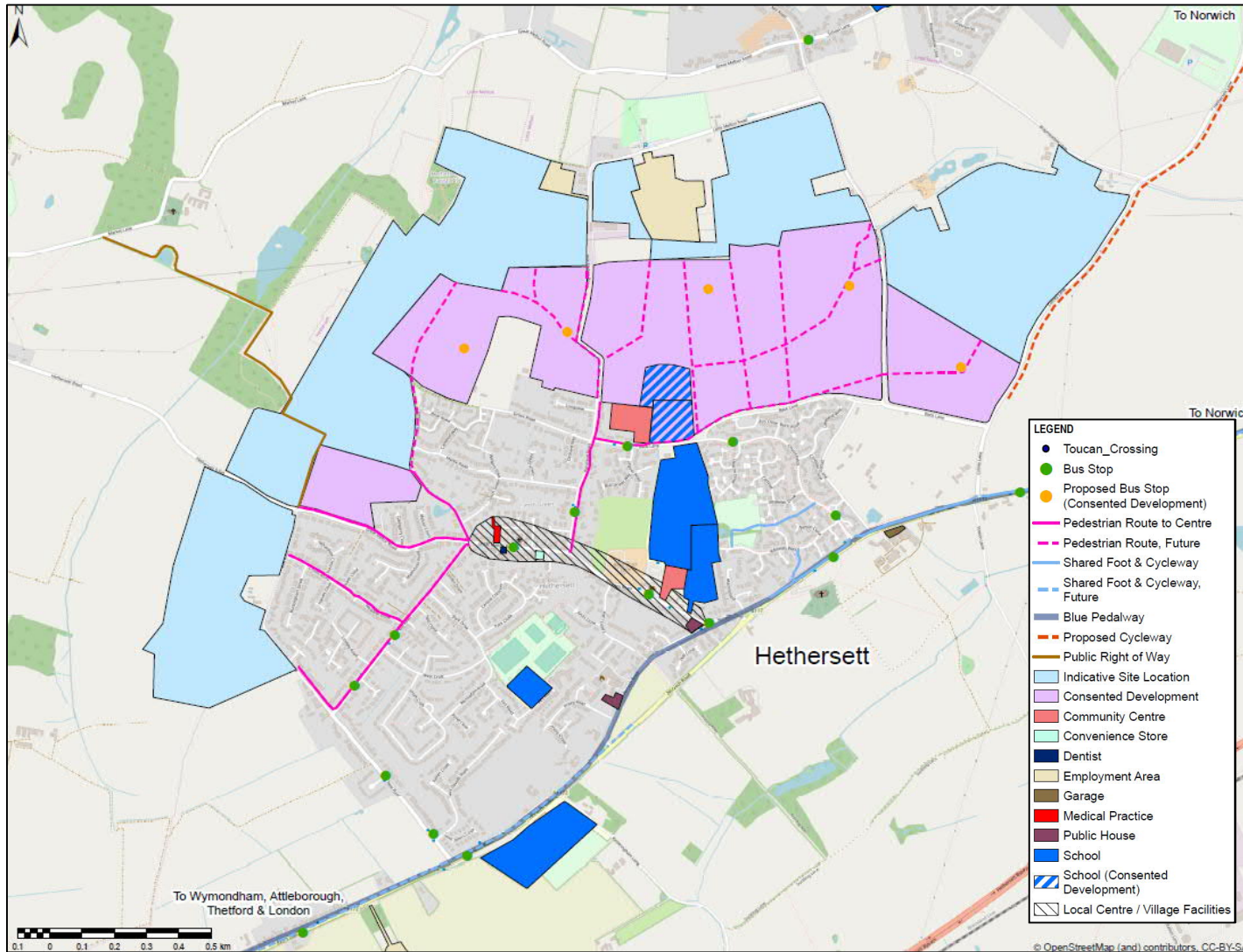
### 4.1 Introduction

This section provides a review of the sustainable transport network in the vicinity of the site and discusses how well connected the site is in respect of a range of sustainable transport options.

### 4.2 Connectivity

Figure 5 below illustrates the site location in the context of the sustainable transport network and the local amenities and facilities with the consented developments in place. The plan highlights the site's location in relation to nearby facilities and amenities as well as the provision for pedestrians, cyclists and public transport users.

Figure 5. Local Amenities and Facilities



A summary of the facilities and links available from the site are set out in the following paragraphs.

#### 4.2.1 Walking and Cycling

Whilst there are currently no formal pedestrian or cyclist facilities within the site, footways are present on the eastern side of New Road and alongside a number of residential roads which connect with Great Melton Road, Little Melton Road, Burnthouse Lane and Colney Lane. These routes are lightly trafficked and provide good connectivity to nearby facilities, amenities and the village centre which are all within reasonable walking distance of the site.

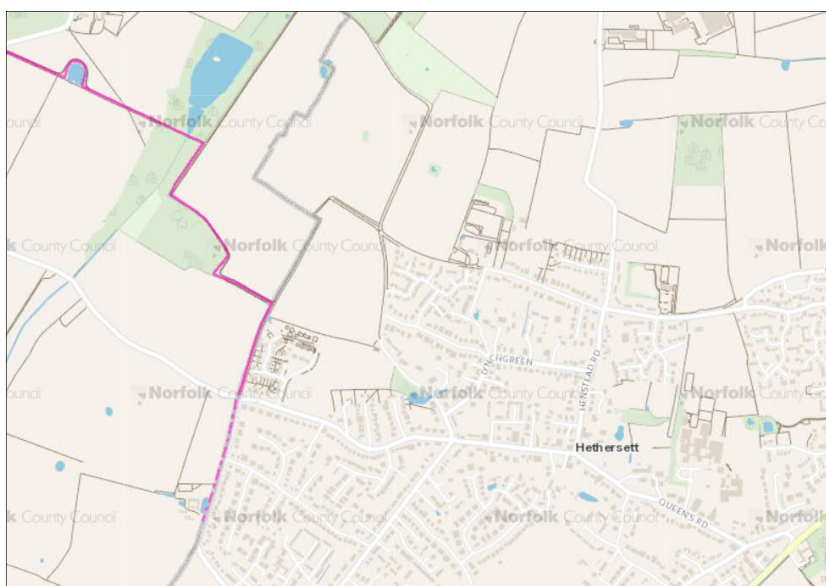
The presence of multiple frontages to the site enables the site to provide additional facilities for pedestrians and cyclists such as further crossing points and paths to connect with existing and proposed (as part of the consented developments) footways / cycleways facilitating access to amenities and facilities in Hethersett village centre via active modes of transport without recourse to the private car.

The Institute of Highways and Transportation (IHT) document 'Providing for Journeys on Foot' (2000) recommends a maximum walking distance of up to two kilometres for trips to work. It should however be noted that there are pedestrians who will travel in excess of this distance and therefore it should be considered indicative. Employment areas to the north of Hethersett and those within Hethersett are all located within the two kilometres recommended walking distance to all areas of the site making it well placed to encourage sustainable transport behaviour.

In terms of cycling, a distance of up to five kilometres is generally considered to be the recommended maximum distance for the average cyclist to travel to and from work. It should however be noted that there are cyclists who will travel in excess of this distance and therefore it should be considered indicative. On this basis, all areas described above are within cycling distance as well as employment areas on the eastern edge of Wymondham, Elm Farm Business Park, Norwich Research Park (NRP), Norfolk and Norwich University Hospital (NNUH) and University of East Anglia (UEA). In addition the Thickthorn Park & Ride is also located with five kilometres of all areas of the site; as such the site is well placed to access significant employment opportunities via active travel.

A public right of way (footpath) is present to the north and east of the site boundary of Area B (as shown on the concept masterplan – see Figure 9) which then continues south to the east of Area A in the form of a restricted byway along New Road. It is proposed that this will be retained as part of scheme within a green corridor. These public rights of way are shown in pink on Figure 6 below.

Figure 6. Public Rights of Way (of relevance to the site)



Source: Norfolk interactive map - <http://maps.norfolk.gov.uk/highways/>

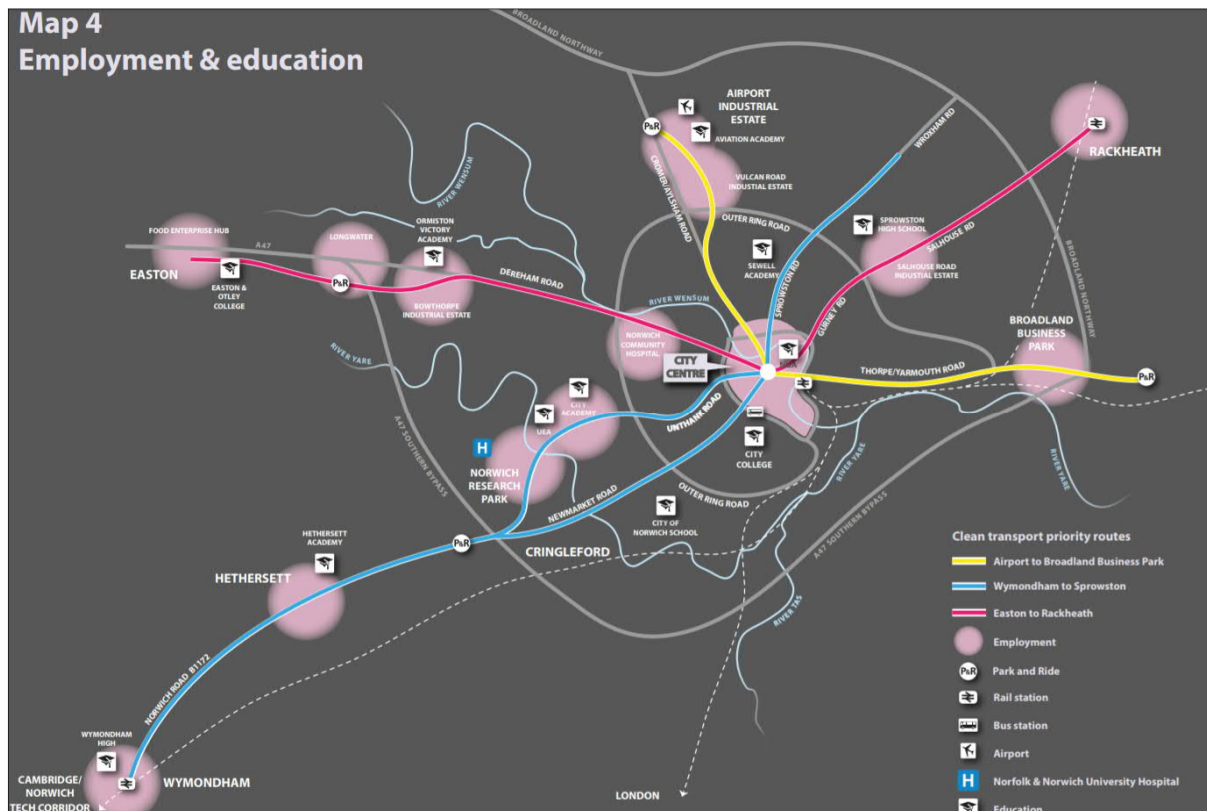
Norfolk County Council (NCC) are currently in the process of providing a 3.3 kilometre long shared footway / cycleway facility between Hethersett and Tutttles Lane East in Wymondham along the B1172 Norwich Road, to the south of Hethersett. This will create a new path linking to existing facilities at either end of the new path and will form part of the Blue Pedalway, a cycle link between Sprowston and Wymondham, via Norwich city centre. This new facility will be easily accessible, and will provide greater cycle links to Norwich and Wymondham, increasing the likelihood of trips being made by cycle. This cycle route will also provide for cycle access to Thickthorn Park & Ride where high frequency bus services are provided to Norwich City.

Further to the extension of the Blue Pedalway, along Colney Lane / Hethersett Lane Norfolk County Council (NCC) are providing a cycle route to the A47 overbridge after which it will be continued as part of the mitigation package for Norwich Research Park (NRP), through to the accesses to NRP South and the B1108 Watton Road providing a greater cycle connection to these key employment areas.

These facilities illustrate that the site is well placed to encourage trips by cycle and encourage sustainable transport behaviour.

NCC, in partnership with Norwich City Council, Broadland District Council and South Norfolk Council, has made an application to the Department for Transport (DfT) as part of the Transforming Cities Fund. The fund aims to make it easier for people to access jobs, training and retail. In September 2018, Greater Norwich was one of ten city areas shortlisted to apply for a share of the £840m grant. The application form shows that one of the clean transport priority routes is Wymondham (via Hethersett) to Sprowston, including access though employment areas such as UEA, NNUH and NRP further enhancing this route for sustainable travel modes. The proposals are illustrated on Figure 7 below.

Figure 7. Clean Priority Routes - Transforming Cities Fund



Source: Norwich Transforming Cities Fund Application Form June 2018

As part of the adjacent Hethersett North consented residential development, a walking and cycling strategy was proposed for implementation over the course of the build period, which is still on-going. This included the following:

- Downgrading of Back Lane and Shop Lane to provide a green pedestrian route linking to Colney Lane from the development and Hethersett;

- Provision of shared surface streets throughout the development;
- Traffic calming / shared-space improvements to Little Melton Road within the site to deter rat-running;
- Traffic calming / shared-space improvements on Henstead Road and Back Lane west of Churchfields;
- Provision of direct, safe and secure pedestrian and cyclist routes between the new residential neighbourhoods and local schools and nearby facilities and amenities;
- Provision of signed walking and cycling routes;
- Provision of a footway along Colney Lane linking to the downgraded Back Lane pedestrian / cycle route;
- Improved pedestrian links to the existing Public Rights of Way network;
- Improved crossing facilities at the B1172 Norwich Road / Colney Lane signalised junction; and
- Provision of a dedicated off-road cycleway along Colney Lane.

As part of the adjacent Heathfields consented residential development, the following improvements to walking and cycling facilities were proposed for implementation over the course of the build period. This included the following:

- A two metre footway on the southern side of Great Melton Road to tie into the existing footway to the east of the site and to be extended west for approximately 26.5 metres to the west of the site access (provided);
- A two metre footway on the northern side of Great Melton Road for the same distance as the southern footway (provided);
- Dropped crossing with tactile paving at either end of the proposed footway extent (provided);
- Provision of a pedestrian link with Cedar Road;
- Install lighting and improve footway surfacing along the public right of way; and
- Facilitate a vehicular connection to the north for the Hethersett North development to connect through the site (provided)

It is envisaged that further improvements to cycling infrastructure will be provided along the frontages of the proposed site, with shared footway / cycleway facilities incorporated into the site design such that they connect with other facilities encouraging trips to be made by bicycle and reducing the need to use the private car.

The existing facilities, planned improvements, as well as further enhancements that could be provided as part of the proposed scheme would result in the provision of high quality network for pedestrians and cyclists such that greater use of these modes is made.

#### 4.2.2 Bus

There are a number of existing bus stops located within Hethersett which are served by highly frequent services over the course of the day. These services pass along Great Melton Road. Those bus stops nearest the site are located on Great Melton Road (adjacent to Cromwell Close), Henstead Road (adjacent to Lynch Green), Back Lane (adjacent to Jaguar Road), Churchfields (adjacent to Lakeland Way and Deacon Drive) and on B1172 Norwich Road (adjacent to Churchfields), which are within a short walk of the site. The services using these stops are summarised in Table 1 below.

Table 1. Bus Services Serving the Nearest Bus Stops to the Development Site

Service	Route Description	Weekday	Saturday	Sunday	Operator	Nearest Existing Stop Location
6	Watton – Norwich	Every 60 mins	Every 60 mins	-	Konectbus	B1172 Norwich Road
6A	Attleborough – Norwich	1 per day	-	-	Konectbus	B1172 Norwich Road
9	Silfield – Norfolk & Norwich University Hospital	Every 120 mins	-	-	Konectbus	B1172 Norwich Road, Great Melton Road, Henstead Road, Back Lane, Churchfields
9A	Hethersett – Norfolk & Norwich University Hospital	1 per day	-	-	Konectbus	B1172 Norwich Road
13	Shipdham – Watton	1 per day	-	-	Konectbus	Great Melton Road, Henstead Road, Back Lane, Churchfields
13A	Attleborough – Norwich	2 per day	3 per day	3 per day	First	Great Melton Road, Henstead Road, Back Lane, Churchfields
13B	Attleborough – Norwich – Spixworth	2 per day	1 per day	Every 60 mins	First	Great Melton Road, Henstead Road, Back Lane, Churchfields
13C	Attleborough – Norwich	1 per day	-	-	First	Great Melton Road, Henstead Road, Back Lane, Churchfields
14	Wymondham – Dussindale Drive	Every 30 mins	-	-	First	Great Melton Road, Henstead Road, Back Lane, Churchfields
15	Wymondham – Blofield Heath	Every 60 mins	-	-	First	Great Melton Road, Henstead Road, Back Lane, Churchfields
15A	Wymondham - Lingwood	Every 60 mins	Every 60 mins	-	First	Great Melton Road, Henstead Road, Back Lane, Churchfields

Source: Traveline South East

Thickthorn Park & Ride is also within a fifteen minute cycle of all parts of the site and is situated along the Blue Pedalway. The Park and Ride provides services every 15 minutes to Norwich City Centre.

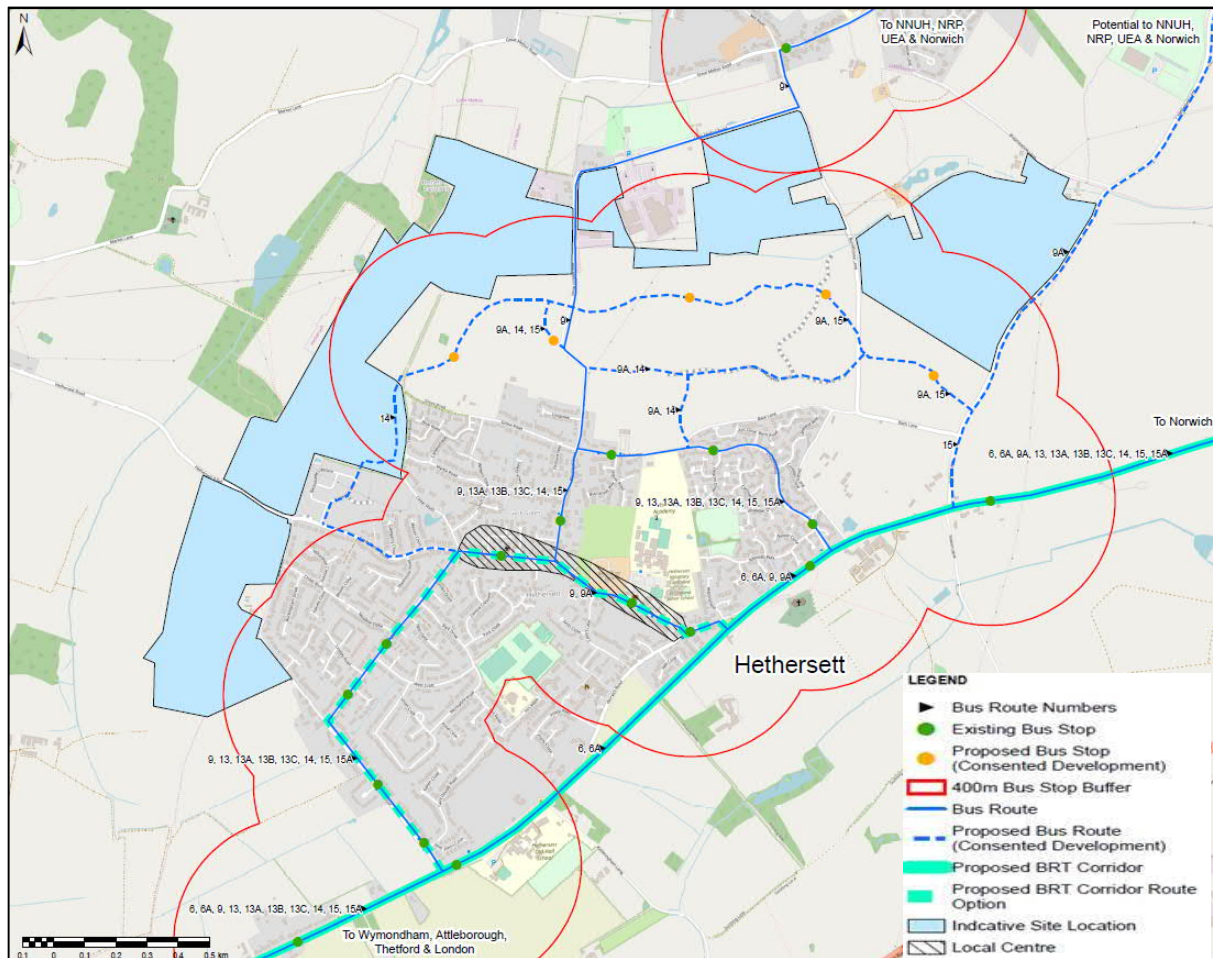
Hethersett also benefits from a Flexibus Ring and Ride service providing a door to door service. There is no fixed timetable; instead the bus follows a route set by the pre-booked requests of passengers. Passengers call the service and their collection and destination locations are programmed into the route for the day.

Table 1 above demonstrates that there are a number of highly frequent services using the existing bus stops within walking distance of the site, therefore encouraging trips to be made by bus reducing the impact of the private car journeys on the local highway network. The site is therefore well located to encourage trips by bus.

Services using those stops nearest the site provide links to the nearby employment and retail areas of Wymondham and Norwich as well as services to other locations such as Attleborough and Watton therefore acting as an excellent alternative to the private car for journeys to other centres.

The location of the existing and proposed bus network (proposed as part of the Hethersett North development) in relation to the proposed site are shown on Figure 8 below.

Figure 8. Hethersett Bus Routes and Stops (Existing and Proposed as part of Hethersett North)



In terms of future provision, the Hethersett North development has a public transport strategy (as shown on Figures 1 and 2) which proposes that all dwellings will be within 400 metres of a bus stop with access to regular bus services between the site and Norwich city centre. Existing routes will also be extended to travel through the site with higher frequencies proposed on other routes especially those linking Hethersett with NRP and NNUH especially during peak commuting periods.

As shown above in Figure 8 the majority of the site areas would be within a 400 metre walking distance of a bus stop (either existing or proposed). Where site areas are more than 400 metres walking distances it is proposed that new bus stops will be provided as part of the scheme. Specifically additional bus stops on Hethersett Road, Little Melton Road and Hethersett Lane would ensure good coverage of the site. Increased frequency, which would be justified once greater population lives in Hethersett, would further improve bus attractiveness as a travel mode.

Furthermore, a Bus Rapid Transit (BRT) route has been identified within the Norwich Area Transport Strategy (NATS) along Norwich Road in Hethersett, with a route option to divert through Hethersett Village. This could further increase the attractiveness of bus travel.

Enabling bus services to travel through the site / close to the site would also further increase the viability of bus travel for residents therefore reducing the reliance on the private car.

#### 4.2.3 Rail

The nearest railway stations are located in Wymondham, some eight kilometres south-west and Norwich, some 14 kilometres to the east. Both can be accessed by bus and could be accessed by bicycle using the Pedalway network. At present some 28 cycle parking spaces are provided at Wymondham whilst at Norwich there are some 442 cycle parking spaces.

Wymondham railway station is situated on the Norwich to Liverpool line where services are available to the end locations as well as intermediate stations such as Ely, Cambridge, Peterborough and Nottingham. Services from the station generally run every hour in either direction, however between 08:00 and 09:00 hours and 17:00 and 18:00 hours, an additional service is provided in each direction increasing the frequency to two per hour.

Further to the services from Wymondham, Norwich railway station also provides highly frequent services to Ipswich, Chelmsford and London providing additional options for journeys by sustainable modes.

Mode share data from the 2011 Census suggests that rail use by those living in Hethersett was relatively low with only 1% of residents using the service, however the demographic and bus network has changed significantly over the past 8 years which is likely to result in higher levels of rail use.

### 4.3 Connectivity to Existing and Consented Amenities and Facilities

There are a number of existing and consented (as part of Hethersett North Development) amenities and facilities shown on Figure 5. Table 2 below sets out the distances from the site and the sustainable mode of transport which could be utilised to reach the amenity and facility identified, based on industry accepted distances and travel times.

The IHT document 'Providing for Journeys on Foot' (2000) recommends a suggested acceptable walking distance to access town centres, commuting and schools and elsewhere. The walking distances from each of the different areas of the proposed scheme, as described in Chapter 6, are summarised in Table 3 below.

Table 2. Suggested Acceptable Walking Distance

	Village Centre (m)	Commuting/School (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1000	800
Preferred Maximum	800	2000	1200

Source: Institute of Highways and Transportation (IHT) document 'Providing for Journeys on Foot' (2000)



Table 3. Distance to Existing and Consented Amenities and Facilities and Mode of Sustainable Transport

Facility / Amenity	Mode	Areas A & B			Area C			Area D			Area E & F						
		Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)	Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)	Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)				
Village Centre	Walking / Cycling	0.8 km	10	2	-	1.0 km	12	3	-	1.2 km	14	4	-	1.8 km	22	5	-
Community Centre	Walking / Cycling	1.5 km	18	5	-	1.2 km	14	4	-	0.9 km	11	3	-	1.8 km	22	5	-
Local Shops	Walking / Cycling	0.8 km	10	2	-	1.0 km	12	3	-	1.2 km	14	4	-	1.9 km	23	6	-
Foodstore (Tesco)	Walking / Cycling	0.95 km	11	3	-	1.1 km	13	3	-	1.2 km	14	4	-	1.9 km	23	6	-
Public House	Walking / Cycling	1.5 km	18	5	-	1.7 km	20	5	-	1.6 km	19	5	-	1.9 km	23	6	-
Library	Walking / Cycling	1.3km	16	4	-	1.5 km	18	5	-	1.4 km	17	4	-	2.1 km	25	6	-
Nearest Dentist	Walking / Cycling	0.8 km	10	2	-	1.0 km	12	3	-	1.4 km	17	4	-	2.0 km	24	6	-
Hethersett Academy - High School	Walking / Cycling	1.4 km	17	4	-	1.6 km	19	5	-	1.5 km	18	5	-	2.2 km	26	7	-
Doctors	Walking / Cycling	0.8 km	10	2	-	1.0 km	12	3	-	1.4 km	17	4	-	2.0 km	24	6	-
Nearest Primary School	Walking / Cycling	1.5 km	18	5	-	1.5 km	18	5	-	0.9 km	11	3	-	0.5 km	6	2	-
Thickthorn Park & Ride	Bus / Cycling	4.3 km	-	13	10	4.3 km	-	13	9	4.0 km	-	12	7	3.3 km	-	10	5

Transport Appraisal

Facility / Amenity	Mode	Areas A & B			Area C			Area D			Area E & F						
		Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)	Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)	Distance*	Walking Time (mins)	Cycling Time (mins)	Bus Time <sup>†</sup> (mins)				
NRP	Bus / Cycling	6.0 km	-	18	17	5.4 km	-	16	12	4.6 km	-	14	9	3.9 km	-	12	8
NNUH	Bus / Cycling	6.7 km	-	20	21	6.2 km	-	19	15	5.4 km	-	16	13	4.7 km	-	14	12
Police Station	Bus / Cycling	4.6 km	-	14	5	5.2 km	-	16	7	5.6 km	-	17	8	6.2 km	-	19	10
Leisure Centre	Bus	5.6 km	-	17	12	6.3 km	-	19	14	7.3 km	-	22	15	7.3 km	-	22	17
Railway Station	Bus	6.8 km	-	20	15	7.4 km	-	22	17	7.8 km	-	23	18	8.3 km	-	25	20

\*Measured from the centre point from the above areas and assumes Hethersett North Development has been fully developed.

<sup>†</sup>Bus times are taken from existing bus services at the nearest bus stop for each area.

- Where there is no value, this mode is not considered to be an option for this trip.

The information set out in Table 3 demonstrates that the majority of the proposed development site areas are within a preferred maximum walking distance of a wide range of local facilities and amenities (existing and proposed). The above table illustrates that the village centre is highly accessible by those travelling by bicycle and for those walking with journey times of approximately five minutes for those cycling and less than 25 minutes for those walking.

The majority of the facilities and amenities located within Hethersett, as well as nearby large employers such as those located at NRP and the NNUH are within a five kilometre cycling distance of the proposed development. This highlights that the site is well located to encourage trips by alternative modes to the private car therefore reducing impact on the local road network.

Further to this, the employment areas at Hethel Engineering Centre, Lotus Cars and Longwater Business and Retail Park in Costessey are located within reasonable cycling distance albeit at a greater distance than five kilometres, which is generally considered to be the recommended maximum distance for the average cyclist to travel to and from work.

A new pre-school, primary school and a Key Stage 3 Campus (up to 990 pupils) is included as part of this scheme and also another pre-school and primary school will be provided as part of the Hethersett North development, which will significantly reduce the distance which future residents of the site are required to travel to the current schools in Hethersett.

#### 4.4 Summary

The above paragraphs summarise how well connected the site is with existing facilities and amenities in Hethersett and the surrounding area. The site will be located within reasonable walking distance of a number of facilities and amenities and accessible through well maintained and lit walking routes. A number of walking and cycling routes will be provided through the adjacent residential areas to the south providing increased connectivity and reducing the reliance on the private car for journeys.

Well served existing and proposed bus stops are located within walking distance of the proposed site whilst the railway stations in Wymondham and Norwich are accessible by taking a number of buses. Where bus stops are not located within acceptable walking distance, it is proposed that new bus stops will be provided along existing and proposed (as part of Hethersett North) bus routes to ensure the proposed site is well served by buses.

New bus stops could therefore be provided along the site frontages to:

- Little Melton Road; and
- Great Melton Road.

Equally the site frontages will include pedestrian and cycle facilities which connect with the existing and proposed pedestrian and cycle network in Hethersett.

The layout of each of the proposed development areas should be designed to be permeable with pedestrian and cycle connections to adjacent development areas maximising the convenience of walking / cycling routes and promoting connectivity with the Village.

The existing and proposed connections ensure that the use of sustainable modes of transport for journeys to work, especially the major employment areas at NRP, UEA and NNUH, retail and schools are possible therefore reducing the reliance on the private car promoting sustainable travel behaviour.

Accident History

05

## 5. Accident History

### 5.1 Introduction

This section of the report sets out a review of the accident history for the local highway network.

### 5.2 Accident Review

A review of the accident records held on the Crashmap website for the most recent five year period for the highway network in the vicinity of the site has been undertaken. Causality factors are not provided within Crashmap and therefore a detailed review of the accidents could not be undertaken.

Table 4 below sets out the number and severity of accidents which have occurred in the vicinity of the site. This confirms that a total of 16 accidents occurred in the area reviewed; with the majority being slight in terms of severity. A single accident was shown to have resulted in a fatality, which resulted in a pedestrian casualty and involved a goods vehicle. This occurred on Great Melton Road, approximately 190 metres to the east of the junction with New Road, which is not located along the site frontage of the site. It is likely that this accident occurred before the footway along the site frontage of the Heathfields development, on the northern side of Great Melton Road, was implemented.

A total of five accidents occurred at the B1172 Ketts Oak / New Road junction, which all involved cars. It is understood that all these accidents involved at least two cars and therefore were likely to be vehicular collisions. No pedestrians or cyclists were casualties. No information on cause of the accidents are provided on Crashmap and an examination of the junction does not highlight any immediate issues. The level of 'slight accidents' is likely to be a combination of vehicle volumes, and vehicle speeds on the edge of the village. Notably there have been no accidents within the last 2 years, and so there may have been some recent changes which have improved the safety record.

Table 4. Accident Severity by Location

	Location	Accident Severity			Total
		Slight	Serious	Fatal	
1	B1172 Ketts Oak / New Road	4	1	0	5
2	Great Melton Road	0	0	1	1
3	Great Melton Road / Mill Road / Lynch Green	0	2	0	2
4	Great Melton Road (village centre)	1	0	0	1
5	Lynch Green	1	0	0	1
6	Queens Road	0	1	0	1
7	Norwich Road / Haconsfield	1	0	0	1
8	Back Lane / Baker Drive / Churchfields	0	1	0	1
9	B1172 Norwich Road / Churchfields	2	0	0	2
10	Little Melton Road / Burnthouse Lane	0	1	0	1
	Total	9	6	1	16

Source: Crashmap.com

On the basis of the above, it is not considered that highway safety is an existing issue which would be affected by the proposals. In addition new footways on both the northern and southern sides of Great Melton Road are now available near the vicinity of the accident, therefore improving pedestrian safety. However as part of any transport related document which is prepared to accompany a planning application, a detailed review of the accident data available from the local authority would be undertaken.

Proposed Scheme

06

## 6. Proposed Scheme

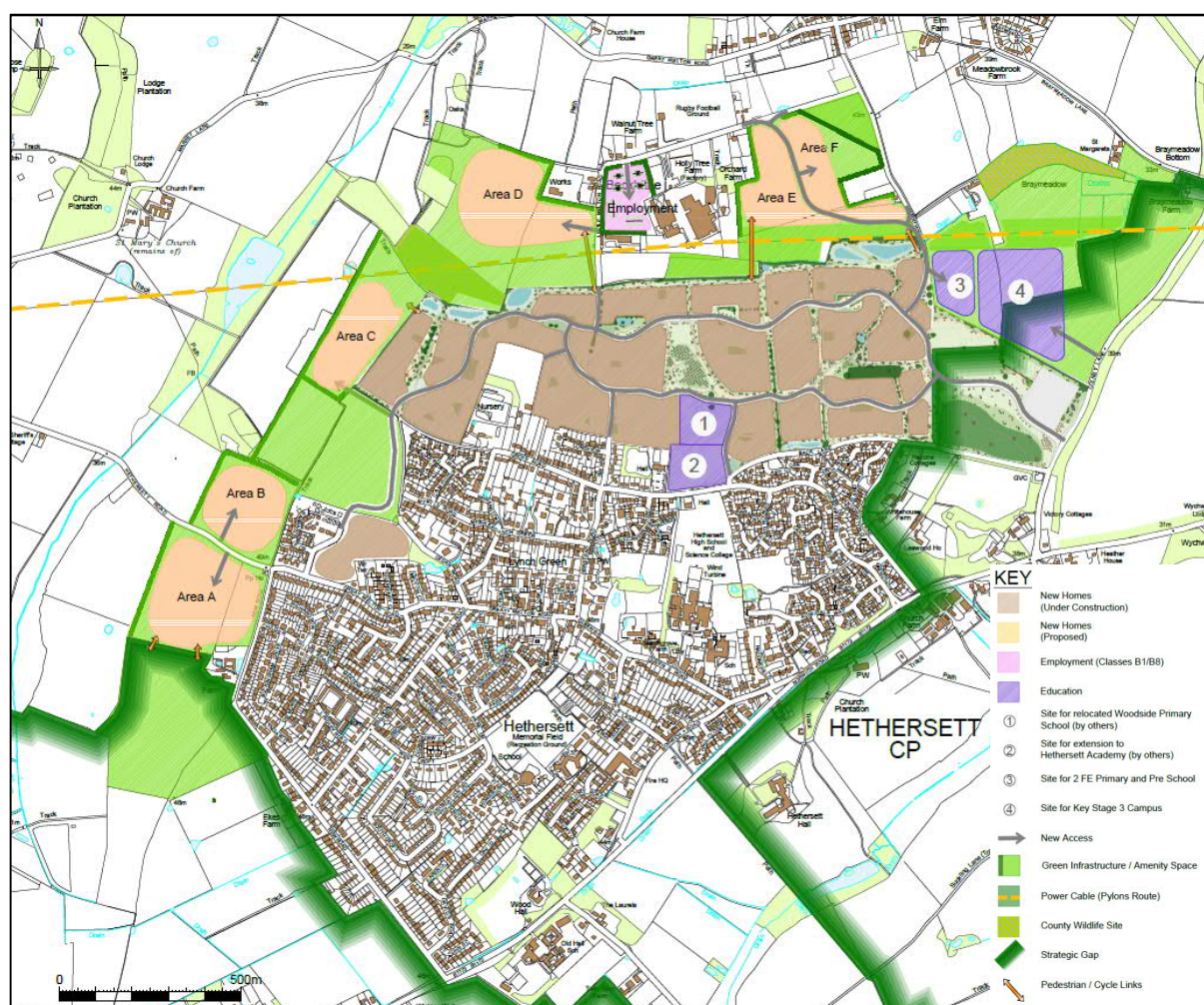
### 6.1 Scheme Overview

The scheme comprises of a residential led mixed use development with the potential to deliver up to approximately 1,000 homes. Further to the new homes, the scheme will provide:

- Green infrastructure and extensive areas of amenity space;
- B1/B8 use classes;
- Community uses;
- A site for a 2 FE primary school and pre-school; and,
- A site for a combined Key Stage 3 and Sports Campus.

The concept masterplan is shown in Figure 9 below.

Figure 9. Concept Masterplan



The concept masterplan illustrates a number of areas, connected by an extensive green infrastructure framework, together with principal access points. The nature of the site and the favourable topography will ensure that design requirements for accesses on any of the frontages will be achievable.

The location of the site accesses allows for the scheme to be delivered in phases. The proposed access arrangements are set out in Table 5 below.

For each area, the proposed scheme can provide pedestrian and cycle connections which will either connect into the Hethersett North development or into existing infrastructure, to ensure high levels of connectivity to the facilities and amenities in Hethersett.

The nature of the site ensures that it is capable of delivering a scheme which is compliant with national guidance in the form of Manual for Streets (MfS). This would ensure that road widths are sufficient to cater for vehicular access but with provision for sustainable modes such as walking and cycling being the priority with new off-road cycle and pedestrian linkages being provided throughout.

To assist in ensuring that safety remains a key priority of the scheme, it is envisaged that the existing 30 mph zones would be extended along the frontages to the site. This would also be beneficial for pedestrians and cyclists travelling between the site and the facilities and amenities within the village.

Following a review of the concept masterplan, Table 5 below sets out the proposed access strategy for the each area of the site.



Table 5. Proposed Access Strategy

	Access and Road Type Requirements	Vehicular Access and Form	Vehicular Access Comments	Pedestrian and Cycle Access/ Links	Public Transport Connectivity (shown on Figure 8)*
Area A Residential (up to circa 280 dwellings)	Type 2 Feeder Road	Main access - New staggered priority crossroads with Hethersett Road and Area B access. (A roundabout could also be provided if required to reinforce the village 'gateway')  Emergency access- could be provided either on Hethersett Road or New Road (could double up as a pedestrian / cycle link), if required.	Junction spacing with Area B vehicular access and New Road will accord with the required staggered junction standards (based on Manual for Streets the standards are 60 metres for a junction on the same side, and 30 metres for a junction on the opposite side).  Localised road widening would be required. Land available within site boundary, therefore feasible to provide this.  Extension of 30mph speed limit to extend to the western side of the access along Hethersett Road.	Pedestrian and cycle accesses via:  1. Vehicular access on Hethersett Road. Footways will be provided to link in from site accesses to existing footways as well as crossing points.  2. New pedestrian / cycle only access and crossing on New Road site frontage to link to existing village footway network  3. Pedestrian and cycle access to the south to enable access to green space  4. Pedestrian / cycle access could also be provided from the emergency access.  Footways will be provided to link in from site accesses to existing footways as well as crossing points.	Nearest bus stop is the existing bus stop located on Mill Road.  New bus stop to be provided along Great Melton Road within 400 metres of the site.
Area B Residential (up to circa 172 dwellings)	Type 3 Access Road	Main access - New staggered priority crossroads with Hethersett Road and Area A access. (A roundabout could also be provided if required to reinforce the village 'gateway')  Emergency access- could be provided either on Hethersett Road (could double up as a pedestrian / cycle link), if required.	Junction spacing with Area A vehicular access and New Road will accord with the required staggered junction standards (based on Manual for Streets the standards are 60 metres for a junction on the same side, and 30 metres for a junction on the opposite side).  Localised road widening would be required. Land available within site boundary, therefore feasible to provide this.  Extension of 30mph speed limit to extend to the western side of the	Pedestrian and cycle accesses via:  1. Vehicular access on Hethersett Road. Footways will be provided to link from site accesses to existing footways as well as crossing points.  2. West of the site to connect into existing public right of way, providing a connection though the Heathfields development.  3. Pedestrian / cycle access could also be provided from the emergency access.	Nearest bus stop is the existing bus stop located on Mill Road.  New bus stop to be provided along Great Melton Road to the east of the site frontage, within 400 metres of the site.

access.

<p>Area C Residential (up to circa 151 dwellings)</p>	<p>Type 2 Access Road leading to a Type 3 access Road within the site (loop to be provided)</p>	<p>Main access - New Priority T access provided from Hethersett North spine road provided to the south of Hethersett North</p>	<p>Access will be phased with delivery of Hethersett North spine road.</p>	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular access on Hethersett Road. Footways will be provided to link in from site accesses to existing footways as well as crossing points.</li> <li>2. The east of the site to connect into the Hethersett North Development. This connection could also double up as an emergency access.</li> </ol>	<p>Nearest bus stop is the proposed bus stop located on the Hethersett North spine road to the east of the proposed site which is within 400 metres of the site.</p>
<p>Area D Residential (up to circa 238 dwellings)</p>	<p>Type 2 Feeder Road</p>	<p>Main access - New Priority T junction access off Little Melton Road  Emergency access – could be provided off Little Melton Road, if required.</p>	<p>Localised road widening to be provided along Little Melton Road.  Speed limit to be reduced in the vicinity of the site.  Junction spacing with other existing accesses along Little Melton Road and the emergency access for this site will accord with the required staggered junction standards (based on Manual for Streets the standards are 60 metres for a junction on the same side, and 30 metres for a junction on the opposite side).</p>	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular access on Hethersett Road. Footways will be provided to link in from site accesses to existing footways as well as crossing points.</li> <li>2. A new pedestrian/cycle access could potentially connect into the Hethersett North development to the south via the green space.</li> </ol>	<p>Nearest bus stop is the proposed bus stop located on the Hethersett North spine road, just off Little Melton Road to the south of this area. Part of this site is within 400 metres of this bus stop.  New bus stop to be provided along Great Melton Road to the west of the existing employment area situated to the west of Little Melton Road, which would enable the whole of the site to be with a 400 metres walking distance of a bus stop (for bus service 9).</p>
<p>Area E Residential (up to circa 133 dwellings)</p>	<p>Type 3 Access Road from Type 2 Feeder Road</p>	<p>New route proposed from Burnthouse Lane to Melton Road as part of the scheme. This would be a Type 2 Feeder Road.  Access to the new feeder road could be provided in the form of two priority T</p>	<p>Junction spacing with vehicular accesses for a T junction along this new route will need to accord with the required standards (based on Manual for Streets the standards are 60 metres for a junction on the same side, and 30 metres for a junction on the opposite side).</p>	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular accesses on Type 2 feeder road. Footways will be provided to link in from site accesses and along this new route to footways within Hethersett North and Burnthouse Lane.</li> <li>2. A separate pedestrian/cycle access to connect into the Hethersett North Development to the</li> </ol>	<p>The nearest bus stops are the proposed bus stop located on the spine road as part of Hethersett North, located to the south of the site and are within a 400 metres distance.</p>

junctions, one to the north-west with Little Melton Road and another to the south-east with Burnthouse Lane. The feeder road would act as the minor arm.

Main access –a staggered T junction with access for Areas F provided off the new route or a mini roundabout.

Emergency access –a access could be provided off the new route, if required.

Speed limit to be reduced in the vicinity of the feeder road on Burnthouse Lane and Little Melton Road.

Localised road widening required along Burnthouse Lane

south via the green space.

3. Pedestrian / cycle access could also be provided from the emergency access.

<p>Area F Residential (up to circa 105 dwellings)</p>	<p>Type 3 Access Road from Type 2 Feeder Road</p>	<p>New route proposed from Burnthouse Lane to Melton Road as part of the scheme. This would be a Type 2 Feeder Road.</p> <p>Access to the new feeder road could be provided in the form of two priority T junctions, one to the north-west with Little Melton Road and another to the south-east with Burnthouse Lane. The feeder road would act as the minor arm.</p> <p>Main access – a staggered T junction with access for Areas E provided off the new route or a mini roundabout</p> <p>Emergency access – could be provided off the new</p>	<p>Junction spacing with vehicular accesses for a T junction along this new route will need to accord with the required standards (based on Manual for Streets the standards are 60 metres for a junction on the same side, and 30 metres for a junction on the opposite side).</p> <p>Speed limit to be reduced in the vicinity of the feeder road on Burnthouse Lane and Little Melton Road.</p>	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular accesses on Type 2 feeder road. Footways will be provided to link in from site accesses and along this new route to footways within Hethersett North and Burnthouse Lane.</li> <li>2. A separate pedestrian/cycle access to connect into the Hethersett North Development to the south via the green space.</li> <li>3. Pedestrian / cycle access could also be provided from the emergency access.</li> </ol>	<p>The nearest bus stops are the proposed bus stop located on the spine road as part of Hethersett North, located to the south of the site and are within a 400 metres distance of the site.</p>
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route, if required.

<p>Area 3 Site for 2FE Primary and Pre- School</p>	-	<p>Main access - New priority T-junction access from the proposed new alignment of Burnthouse Lane.</p>	-	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular accesses on Burnthouse Lane. Footways will be provided to link site accesses to the proposed footways to be provided along the new aligned Burnthouse Lane.</li> <li>2. Potential to provide a separate pedestrian/cycle access to connect into the Hethersett North Development to the south via the green space.</li> </ol>	<p>The nearest bus stops are the proposed bus stop located on the spine road as part of Hethersett North, located to the south west of the site and is located within a 400 metres distance of the site (proposed to be served by the 5 and 9A services).</p>
<p>Area 4 Site for Combined Key Stage 3 and Sports Campus</p>	-	<p>Main access – new priority T junction access from Burnthouse Lane with scope to provide a main access –(New priority T junction) off Colney Lane, depending on the nature of proposed uses.</p>	-	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. A cycle / pedestrian connection linking area 3 with area 4 to allow connectivity onto Burnthouse Lane</li> </ol>	<p>The nearest bus stops are the proposed bus stop located on the spine road as part of Hethersett North, located to the south west of the site and is located within a 400 metres distance of the site (proposed to be served by the 5 and 9A services).</p>
<p>Employment Area B1/B8 Use Class</p>	-	<p>New vehicular access provided in the form of a priority T junction from Little Melton Road.</p>	-	<p>Pedestrian and cycle accesses via:</p> <ol style="list-style-type: none"> <li>1. Vehicular access on Little Melton Road. Footways will be provided to link in from site accesses to existing footways.</li> <li>2. A separate pedestrian/cycle access on the southern western corner of the site, onto Little Melton Road which would tie in to the footway provided as part of Area D.</li> </ol>	<p>Nearest bus stop is the proposed bus stop located on the spine road, just off Little Melton Road to the south of this area. Part of this site is within 400 metres of this bus stop.  New bus stop to be provided along Great Melton Road to the east of the existing employment area situated to the west of Little Melton Road, which would enable the whole of employment site to be with a 400 metres walking distance of a bus stop (for bus service 9).</p>

\* This has been based on the proposed bus routes as set out in the Hethersett North decision notice as part of the parameter plans, as well as the proposed bus stop locations as illustrated in the Transport Assessment associated with that development.

# Trip Generation and Distribution

07

## 7. Trip Generation and Distribution

### 7.1 Introduction

This section of the report sets out the potential level of vehicular trips which could be generated by the scheme and how they could be distributed onto the local road network.

### 7.2 Trip Generation

#### Residential

In order to establish the level of vehicular trips considered likely to be generated by the scheme, reference has been made to the TA prepared for Land North of Hethersett development which is adjacent to the site. In order to derive trips associated with Hethersett North, the following methodology was used:

- 'Total people' trip rates were obtained from the Trip Rate Information Computer System (TRICS) database.
- Disaggregation of 'total people' trip rates by 'peak hour journey purpose' obtained from National Travel Survey (NTS) Table 0502.
- Disaggregation of 'total people' commute trip rates by modal split obtained from Census 2001 'Travel to Work' data.
- Aggregation of vehicular Commute, Education and Other Purpose trip rates to determine final trip rates for the Land North of Hethersett consented development.

The resultant vehicular trip rates used in the assessment for the Hethersett North development are set out in Table 6 below.

Table 6. Vehicular Trip Rates - Weekday

Mode	Trip Rates Per Dwelling					
	AM Peak (0745-0845)			PM Peak (1700-1800)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Vehicles	0.101	0.362	0.463	0.311	0.180	0.491

Source: Transport Assessment for Land North of Hethersett, Bidwells, 2012

As the Hethersett North development is sited adjacent to the site, it is considered appropriate to apply these rates to the new homes element of the scheme (approximately 1,000 homes). This results in the number of vehicular trips as set out in Table 7 below.

Table 7. Vehicular Trip Generation - Weekday

Mode	Trip Generation (1,078 Dwellings)					
	AM Peak (0745-0845)			PM Peak (1700-1800)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Vehicles	109	389	498	334	194	528

#### Employment

The scheme includes for the provision of employment space to the west of the existing employment, although the precise amount and nature of this element of the scheme is unknown at this stage. It is expected that a proportion of residential trips generated in the peak hours would be travelling to these employment facilities. According to the National Travel Survey results for 2016, only 27% of trips are for commuting and business purposes, with the remaining 73% for personal trips such as education, escorting, leisure and shopping. With the site's connectivity with the facilities and amenities in Hethersett as well as the nearby Thickthorn Park and Ride facility and the employment sites at NRP, the UEA and the NNUH, there is significant scope to reduce the level of vehicular trips the site could generate through the use of more sustainable modes of transport.

## Education – Pre-school, Primary School and Key Stage 3 Campus

The scheme includes a new 420 pupil primary school, and a 56 space pre-school. Also a Key Stage 3 Campus is proposed for up to 990 pupils, of which 810 would be relocated from Hethersett Academy, therefore resulting in an additional 180 new pupil spaces. These education facilities would mainly provide for existing and future education needs local to Hethersett with pupils from the wider area accessing the site by bus. As such this use would be largely ancillary to the proposed scheme, Hethersett North development and Hethersett village. Therefore the trip generation for these education facilities has not be quantified within this report, which is consistent with the approach taken for the Hethersett North development at planning stage. The provision of these education facilities as part of the proposed scheme would enable a more sustainable development.

The pre-school and primary school is proposed to be located on Site 3, located east of Hethersett North development. The Key Stage 3 Campus is proposed to be located adjacent to Site 3, on Site 4, with both sites to be accessed via Burnthouse Lane for all modes of transport, allowing the site to be well connected in terms of sustainable travel to the committed and proposed extension of Hethersett. A possible vehicular access could be provided from Colney Lane, as shown on the concept masterplan.

The pre-school and primary school would predominantly cater for those pupils moving into the new homes provided as part of Hethersett North and also as part of the proposed scheme. The majority of trips associated with the new Key Stage 3 campus would be existing trips being relocated from Hethersett Academy. It would be expected that the majority of these school trips would be via sustainable modes of travel, however for those pupils who live outside of Hethersett, it is likely that school buses will continue to be provided to key villages in the surrounding catchment area.

Due to the education site location is anticipated that any associated vehicular trips would travel to the schools via the existing internal roads in Hethersett and also via the highway network associated with Hethersett North development. It is therefore anticipated that the majority of vehicular trips would not enter onto the highway network external to Hethersett.

## Sports Campus

It is anticipated that the Sports Campus also proposed as part of the scheme, on Site 4, would not generate peak hour vehicular trips other than staff, which would be small in number, therefore the trip generation for this use has not been quantified within this report, and it would be considered an ancillary facility for this stage of assessment.

## 7.3 Mode Share

A review of the data from the 2011 Census enables a travel to work mode share for Hethersett to be derived. The resulting mode share, applicable to the site, is set out in Table 8.

Table 8. Census 2011 Mode Share (Hethersett) – Based on Journey to Work data

Mode	Percentage
Rail	1%
Bus	11%
Taxi	0%
Motorcycle	1%
Car Driver	73%
Car Passenger	5%
Cycle	5%
Pedestrian	4%
Total	100%

Source: NomisWeb

This demonstrates that the most commonly chosen mode of transport to work for residents of Hethersett at this time was to drive. This therefore provides a significant opportunity for reducing car driver mode share in Hethersett for existing and future trips.

The increasing levels of traffic congestion in Norwich and generally, along with the ongoing investment in sustainable transport infrastructure in the area, including the proposed cycleway link with NRP via Colney Lane, improvements to the Blue Pedalway will support mode shift from car use in Hethersett for existing and future trips. Furthermore the position of the site near to the existing employment areas of NRP, NNUH and the UEA as well as nearby Hethel Engineering Centre, Lotus Cars and Longwater Business and Retail Park will assist in encouraging trips to be made by more sustainable modes of transport thus further reducing the reliance on the private car and enabling the development to achieve targets set out in the Travel Plan.

The proposed site location provides strong access to sustainable modes of transport for journeys within Hethersett and to wider destinations. NCC requires Travel Plans to be implemented at developments across the county. A well-structured Travel Plan promoting the highly accessible nature of the development site would be implemented. Within NCC’s guidance a target mode shift of 18% is applicable to developments located in the Norwich policy area, which covers Hethersett. Applying an 18% reduction to car driver mode shares would result in the travel to work mode shares as set out in Table 9 below. Implementation of a well-funded Travel Plan at this already accessible site would be expected to achieve this target reduction.

Table 9. Anticipated Future Mode Share (Hethersett)

Mode	Percentage
Rail	1%
Bus	11%
Taxi	0%
Motorcycle	1%
Car Driver	60%
Car Passenger	5%
Cycle	5%
Pedestrian	4%
Total	100%

Taking this anticipated reduction in car driver trips into account, the development site would be expected to result in car driver trips as set out in Table 10 below.

Table 10. Anticipated Car Driver Trips

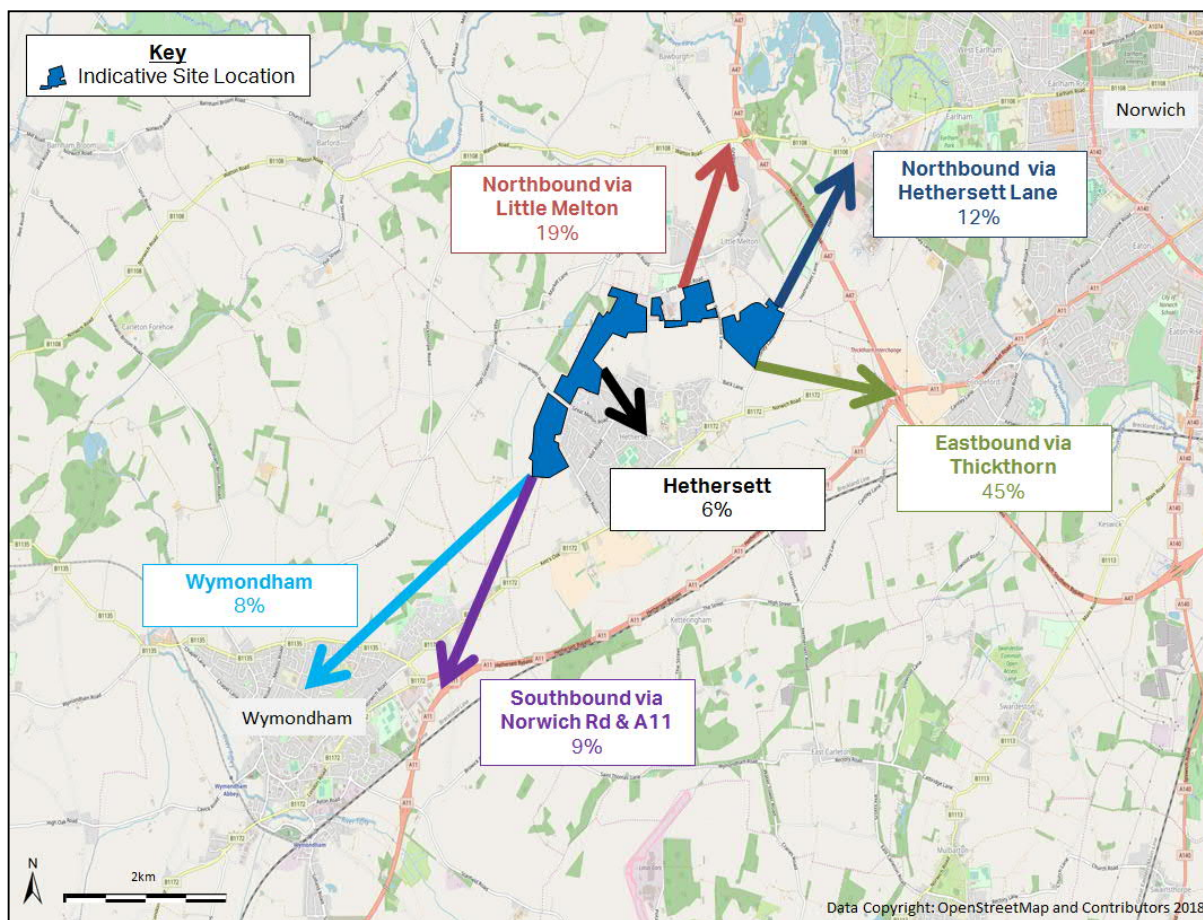
Mode	Development Trips					
	AM Peak (07:45-08:45)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Car Driver	89	319	408	274	159	433

## 7.4 Trip Distribution

A review of the Census 2011 Journey to Work Origin Destination data provides the distribution of all travel to work car driver trips from Hethersett. These trips are widely dispersed to a number of locations, with the strongest draw being to Norwich. The vehicular resultant trip distribution is illustrated on Figure 11 below.



Figure 11. Vehicular Trip Distribution



The site is well located such that residual traffic can utilise a number of different routes and modes therefore dispersing car trips onto the external highway network.

Some 45% of trips are expected to travel east towards Norwich using the Thickthorn Interchange. This is the desire line for which sustainable transport choices such as bus, rail, cycle and ride from Thickthorn Park & Ride, car sharing and cycling are strongest, and which has been the subject of significant improvements and for which further improvements are planned.

Some 6% of car driver trips to work are expected to remain within Hethersett, for which there is good accessibility by foot, and cycle.

Some 19% of trips would be expected to head north from Hethersett, potentially through Little Melton, although equally for the sites A and B, it may be preferable to access the A47 northbound through Thickthorn Interchange.

This trip distribution has been based on 2011 Census data, and therefore does not take into account any recent changes to travel patterns due to improvements in local transport infrastructure in the local area. Equally it does not take into account changes in employment areas, for example the nearby employment areas at NRP have permission to deliver in the region of 5,000 jobs and as this development comes forward it is likely to alter the distribution of travel to work trips from Hethersett.

In addition with improvements to the local sustainable transport network proposed, this will encourage trips to be made by modes other than the private car therefore reducing the impact of the development at the junctions on the network identified as being constrained.

However, based on the current available evidence it is expected that cumulatively the proposed development areas would generate traffic as indicated in the Table 11 below.

Table 11. Potential Development Trips on the Highway Network

Trip Generation (1,075 Dwellings)

	AM Peak (0745-0845)			PM Peak (1700-1800)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
A11 South via Wymondham	8	29	37	25	14	39
A47 East via Thickthorn	28	102	131	88	51	139
A47 West via Little Melton	15	54	69	47	27	74
B1108 via Little Melton	2	6	8	5	3	9
Hethersett Lane	11	38	49	33	19	52
Newmarket Road via Thickthorn	12	45	57	38	22	61
Norwich Road South Towards Wymondham	7	26	33	22	13	35
Within Hethersett	5	19	24	16	10	26

The potential implications of these increases in traffic are discussed further in the next Chapter.

# Highway Network Review

08

## 8. Highway Network Review

### 8.1 Introduction

This section sets out the potential operation of the junctions which would be affected by the proposed scheme and sets out any potential highway network improvements.

### 8.2 Potential Off Site Highway Network Constraints

A review of the Transport Assessment prepared for the Hethersett North development identifies that, in the future, parts of the network are predicted to operate close to or at capacity. The junctions local to the site where capacity issues were identified by other developments, or are known through AECOM's experience, are:

- B1172 Norwich Road / Colney Lane priority 'T' junction;

This junction is predicted to experience up to 188 two way additional vehicle movements in the AM Peak and up to 199 additional two way vehicle movements in the PM Peak. This represents an increase of up to 8 % in both peak hours over the design flows assumed for the committed Hethersett North development. Due to the location of the different development areas and associated vehicular accesses it is likely that not all development trips would pass through this junction.

This junction was identified for improvement as part of the Transport Assessment for the Hethersett North development with a signalised option assessed.

The results for the signalised option in the Transport Assessment suggest that the critical time was the AM peak hour, when the junction was predicted to operate with minimal spare capacity (-5.1% Practical Reserve Capacity (PRC)). PRC is a term used to denote the maximum desirable flow through a signalised junction and 0% PRC is reached when one or more of the approaches to the junction are operating at 90% of their capacity. Therefore it should be recognised that the actual maximum limit for a signalised junction is -10% PRC and a junction could therefore be considered to be operating within its maximum capacity with a PRC value of -9.99%. The proposed junction was predicted to operate within 4.49% of maximum capacity limits during the AM Peak period.

At this location it is expected that MOVA would be implemented as part of the forthcoming signalised junction. This prioritises approaches that have a high demand and efficiently alters the green time allocated at the junction. MOVA aims to determine a set of signal timings which maximises the throughput of the junction under the current conditions. MOVA has been reported to provide a 13% reduction in queue lengths; however this reduction can vary from junction to junction. The implementation of MOVA cannot be easily replicated in the junction modelling software therefore the results provided in the Hethersett North Transport Assessment do not take into account the benefits of MOVA.

Therefore whilst this junction was a constraint in the past, the mitigation scheme identified to support Hethersett North ensures that there is some reserve capacity available.

With the addition of predicted vehicular trips associated with this scheme, it is likely that the proposed signalised junction will operate close to capacity in the AM peak hour but based on the level of increase in traffic predicted it is expected that scope exists to manage the development impacts with optimised signal timings.

Further measures which could be implemented to improve the situation further would include promoting bus use for trips to the east from the site, and equally promoting pedestrian and cycle trips to both the Park & Ride facility and towards Norwich.

- B1108 Watton Road / Hethersett Lane priority T junction;

This junction is predicted to experience up to 49 two way additional vehicle movements in the AM Peak and up to 52 additional two way vehicle movements in the PM Peak.

This junction was identified for improvement as part of the Transport Assessment for the Hethersett North development with a signalised option assessed. Since this Transport Assessment was prepared further proposals for development at NRP have come forward resulting in this junction being upgraded to a signalised 'T' junction. The design of the junction has been such that it can cater for traffic growth up to at least 2026 and to accommodate traffic associated with a number of residential developments local to NRP.

The results in the NRP Transport Assessment illustrate that the signalised junction has spare capacity in the 2026 future year with development scenario, with a maximum Degree of Saturation of 74% in the PM peak hour. Degrees of Saturation values of 90% and less are indicators that a junction is operating within capacity. Although a junction would be said to be operating at capacity at values of 100%, the use of 90% allow for a margin of error and fluctuations in traffic flows. Junctions are therefore only identified as operating over capacity if these values are exceeded. Therefore based on these results it is likely that the signalised junction would be able to accommodate the vehicular trips associated with this scheme. Reducing traffic demand by targeting a lower car driver mode share in the area through supporting sustainable travel options would help to improve the situation further.

This junction is not expected to be a constraint.

- Priority T junction at B1172 Norwich Road / Churchfields;

This junction was assessed as part of the Transport Assessment for the Hethersett North development, which illustrated that the junction would operate over capacity in the AM peak hour on Churchfields arm, without the addition of any trips associated with this development. Despite this junction operating over capacity in the AM peak, Hethersett North did not propose any mitigation at this junction, due to the minimal number of development trips predicted to use this junction.

Based upon the concept masterplan for the proposed scheme, it is anticipated that due to the likely development trip distribution there would not be a significant amount of development trips utilising this junction to access onto the B1172. Other junctions onto the B1172 would be more attractive for use of the development trips based on the location of the development areas, and would therefore use other junctions as New Road / B1172 junction and the Colney Lane / B1172 junction.

Potential mitigation at this junction could include signalisation to assist traffic exiting Churchfields.

- Priority T junction at B1172 Norwich Road / New Road;

This junction was assessed as part of the Hethersett North Development, and in the future year with development it was predicted to operate with spare capacity, with a maximum Ratio of Flow to Capacity (RFC) of 0.59. It is generally accepted that RFC values of 0.85 or less are indicators that a junction is operating within capacity. Although a junction would be said to be operating at capacity at values of 1, the use of 0.85 allow for a margin of error and fluctuations in traffic flows. Junctions are therefore only identified as operating over capacity if these values are exceeded. With the likely distribution of development trips it is anticipated that this junction can accommodate the proposed development trips and therefore likely that no mitigation would be required.

- B1135 Tuttle Lane East / Norwich Road / B1172 Norwich Common / B1135 four-arm roundabout;

This junction is predicted to experience up to 69 two way additional vehicle movements in the AM Peak and up to 74 additional two way vehicle movements in the PM Peak. This level of trips is not considered to be significant at this location and many of the Wymondham bound trips would have the option of increasing sustainable travel options.

This junction was identified for improvement as part of recent developments and NCC have implemented a capacity improvement scheme to cater for current consented growth in Wymondham.

Previously identified schemes to signalise the Tuttle Lane East / Norwich Road / Norwich Common junction may need to be re-examined as part of a detailed transport assessment of the development proposals in the context of managing future traffic movements, but not before the potential distribution of trips across other modes and other routes is fully taken into account. Of the trips predicted to pass through this junction, almost 50% are travelling between Wymondham and Hethersett, which, given the 5km distance and improving bus services, could be catered for easily through sustainable modes.

- Harts Farm Road / B1135 / Falconers Chase Roundabout – Wymondham;

Issues experienced at this junction relate to blocking back problems from the adjacent B1135 Tuttlés Lane East / Norwich Road / B1172 Norwich Common / B1135 four-arm junction and the proximity to Waitrose at times impacts on the effectiveness of operation.

This junction in isolation is not predicted to suffer capacity problems in the near future and the recent improvements at the B1135 Tuttlés Lane East / Norwich Road / B1172 Norwich Common / B1135 four-arm roundabout have alleviated problems.

- A47 / A11 junction, known as Thickthorn Interchange;

This junction is predicted to experience up to 188 two way additional vehicle movements in the AM Peak and up to 200 additional two way vehicle movements in the PM Peak.

Whilst this junction has long been acknowledged as a constraint to traffic growth, a number of committed improvements have been identified for implementation by local permitted developments. These are being progressed through discussions with the highway and planning authorities.

Furthermore this junction has been identified for improvement as part of a £15.1 billion investment to improve journeys on England's major A roads and motorways. A scheme to upgrade the junction to a high quality interchange including free-flow links in both directions between the A11 and the A47 eastern link is being progressed through the Development Consent Order (DCO) process. The proposals for improvements to the Thickthorn Interchange are at an advanced stage with work to improve the junction likely to start in 2020/2021. The proposals are designed to cater for a 30% increase in traffic up to 2036. The junction will therefore be more than able to cater with the traffic associated with the proposed development.

Also the Park & Ride at Thickthorn provides a feasible and viable option for people travelling into Norwich from Hethersett, especially with the increase in car parking spaces being provided as part of Hethersett North development, therefore this has the potential for a reduction in vehicular trips at this junction.

- Little Melton / Burnthouse Lane Priority T Junction; and

This junction was not assessed as part of the Hethersett North Development, however from reviewing the current junction arrangement possible improvements to the junction to improve visibility to the left (for those exiting Little Melton Road) would likely need to be provided.

- Great Melton Road / Mill Road / School Lane / Burnthouse Lane Crossroads.

This junction is predicted to experience up to 77 two-way additional vehicle movements in the AM Peak and up to 83 additional two way vehicle movements in the PM Peak.

This junction was not assessed as part of the Hethersett North Development. From reviewing the current junction arrangement, the available land at the junction is limited; therefore major changes to the junction would not be possible and would also not be in keeping with the junctions in the surrounding area. Any mitigation would therefore likely involve traffic calming measures along the key routes through Little Melton, to slow traffic and make the route less attractive.

The above junctions would be fully assessed as part of any planning application which came forward to ensure that they could accommodate the traffic associated with the proposed scheme.

It is clear that existing junction capacity constraints are being addressed through improvements which have been carried out, or are planned to address existing highway capacity issues.

In terms of the strategic road network the improvements planned will allow for further growth in this area and the need for substantial further capacity improvements is unlikely, but this would be assessed in detail at the planning application stage.

Equally the development site is positioned such that more than one route option is available to access the wider highway network from all site parcels. The nature of the scheme also means that it could be phased alongside highway improvements.

The implementation of the clean priority route from Wymondham to Norwich and Sprowston, as well as the extension of the Blue Pedalway to Wymondham, is likely to assist in reducing the number of vehicular trips using a number of these junctions such as B1172 Norwich Road / Colney Lane priority 'T' junction, B1135 Tuttle Lane East / Norwich Road / B1172 Norwich Common / B1135 four-arm roundabout, Priority T-junction at B1172 Norwich Road / Churchfields and the A47 / A11 junction, known as Thickthorn Interchange.

Overall there are no insurmountable highway capacity issues anticipated on the highway network serving the site.

Mitigation

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## 9. Mitigation

### 9.1 Introduction

This section of the report provides a review of the likely mitigation requirements associated with the proposed development and the deliverability of those requirements.

### 9.2 Sustainable Travel

Given the site location is in close proximity to schools, services, jobs and sustainable links to other major centres, it is anticipated that focussing on sustainable transport promotion in the first instance is the most appropriate way to approach development mitigation.

In order for the development to come forward it is anticipated that the following mitigation may be required:

- Improvements to the pedestrian and cycle network within Hethersett such that proposed provision associated with other developments and existing provision are linked and well connected;
- Provision of enhanced cycle and pedestrian facilities and infrastructure;
- Provision of enhanced bus services and infrastructure;
- Potential provision of additional bus stops;
- Provision of enhanced facilities at nearby bus stops;
- Investment in additional cycle parking at Thickthorn Park & Ride;
- Implementation of a Travel Plan for all aspects of the proposed scheme which could include the below measures to promote sustainable travel modes:
  - Promotion of car/ lift sharing;
  - Provision of a car club;
  - Promotion of electric bikes;
  - Travel Information Welcome Packs (to include sustainable transport information); and
  - Community Notice Board (to include sustainable transport information).
- Investment in local travel planning in the nearby residential areas to support generalised mode shift in Hethersett.

### 9.3 Off Site Highway Network

The highway network in the context of the proposed scheme was discussed in Chapter 7, with the following junctions identified as possibly requiring mitigation or contributions:

- B1172 Norwich Road / Colney Lane signalised scheme as part of Hethersett North development;
- Priority T-junction at B1172 Norwich Road / Churchfields;
- B1108 Watton Road / Hethersett Lane signalised junction;
- Little Melton / Burnthouse Lane Priority T Junction;
- Melton Road / Mill Road / School Lane / Burnthouse Lane Crossroads;
- B1135 Tuttle Lane East / Norwich Road / B1172 Norwich Common / B1135 four-arm roundabout; and
- A47 / A11 junction, known as Thickthorn Interchange.

It is clear that some of the highway constraints are being addressed through improvements which have been carried out, or are planned to address existing problems. Additional mitigation or contributions to highway schemes may be required once further analysis of the junctions has been undertaken.

Previously identified schemes to signalise the Tutttles Lane East / Norwich Road / Norwich Common junction may need to be re-examined as part of a detailed transport assessment of the development proposals in the context of managing future traffic movements, but not before the potential distribution of trips across other modes and other routes is fully taken into account.

In terms of the strategic road network the improvements planned will allow for further growth in this area and the need for substantial further capacity improvements is unlikely, but this would be assessed in detail at the planning application stage.

In addition to the proposals for the Thickthorn Interchange, NCC and Highways England (HE) are proposing improvements at locations slightly further afield which will further increase the capacity at Thickthorn Interchange. This includes the extension of the Norwich Distributor Road (NDR) to the west linking with the A47 whereby traffic currently travelling through Thickthorn Interchange from the west to reach destinations to the north of Norwich will use the NDR therefore reducing traffic and pressure at Thickthorn.

# Summary and Conclusions

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## 10. Summary and Conclusions

The concept scheme includes provision for up to 1,000 new homes, employment area for B1/B8 use classes, a new Education and Sports Campus for a 2 FE primary school and pre-school and a site for a Key Stage 3 campus, green infrastructure and extensive areas of amenity space on land North and West of Hethersett. Access to the site is proposed from a number of locations off Great Melton Road, Little Melton Road, Burnthouse Lane and Colney Lane.

The site has good connectivity and links to a number existing facilities and amenities within Hethersett, as well as a number of others situated within reasonable walking or cycling distance along existing, and proposed routes conducive to both modes. A cycle distance of five kilometres reaches Wymondham, Elm Farm Business Park, Thickethorne Park and Ride, Norwich Research Park (NRP), Norfolk and Norwich University Hospital (NNUH) and University of East Anglia (UEA). The existing and proposed primary and existing and proposed high school/ Key stage 3 campus are within walking and cycling distance of the site.

6% of Hethersett residents remain in Hethersett for jobs, reducing the need for car travel out of Hethersett. The quantum of development is also large enough to further support internalisation of trips relating to the proposed employment use reducing the need for vehicular travel.

Well served existing and proposed (as part of Hethersett North) bus stops are located within reasonable walking distance of the site. These include frequent routes serving Wymondham and other local towns such as Watton, Dereham and Attleborough as well as excellent links to Norwich. Many of these bus services will benefit from planned and ongoing improvements to the bus network, including a Bus Rapid Transit (BRT) route which has been identified within the Norwich Area Transport Strategy (NATS) along Norwich Road in Hethersett. Additional bus stops within the proposed scheme will ensure all areas are within walking distance of travel by bus.

The site would be linked to the Blue Pedalway connecting Hethersett to Sprowston via Norwich city centre to the east, and to Wymondham to the west, currently under construction. The Blue Pedalway also links the development site with Thickethorne Park and Ride from which bus services to Norwich are provided every 15 minutes. The same route is also being promoted as a clean route as part of the Transforming Cities Fund, and also includes access through employment areas such as UEA, NNUH and NRP enhancing this route for sustainable travel modes.

Along Colney Lane / Hethersett Lane Norfolk County Council (NCC) are providing a cycle route to the A47 overbridge after which it will be continued as part of the mitigation package for Norwich Research Park (NRP), through to the accesses to NRP South and the B1108 Watton Road, providing improved cycle access to these key local employment areas.

Given the links to sustainable modes of transport, the use of the private car should not be the first mode of choice for residents of the development therefore limiting the effect on nearby junctions. The high level of car driver trips for journeys to work from Hethersett at 73%, as recorded in the 2011 Census, is expected to reduce significantly given the changes on the local transport network. Further, the scheme will be designed to encourage a significantly higher sustainable transport mode shares given the local facilities available.

The site is situated such that there are a number of routes for those travelling by car to access the A11 and wider highway network. The site location will allow the dilution of impacts across the road network. The recently improved B1135 Tuttle Road East / Norwich Road / Norwich Common four-arm roundabout is a local network constraint which may require some form of signalisation to manage future traffic movements, but it is not anticipated to present a constraint.

The Thickethorne Interchange between A11 and A47 is a long standing local network constraint which will be addressed as part of a major scheme being delivered by Highways England. Construction of the major scheme is planned to commence in 2022. The proposed scheme has been identified to cater for growth up to 2036. Again, this junction is not anticipated to present a constraint.

Further improvements are proposed as part of the adjacent consented residential development at the B1172 Norwich Road / Colney Lane junction in the form of signalisation. It is anticipated that this signalised scheme would be able to accommodate the vehicular trips associated with this scheme. Reducing traffic demand by targeting a lower car driver mode share in the area through supporting sustainable travel options would help to improve the situation.

The B1108 Watton Road / Hethersett Lane junction has already been signalised as part of the Norwich Research Park Expansion. This junction is not anticipated to be a constraint.

It is anticipated that the following enhancements could be provided as part of the scheme:

- Improvements to the pedestrian and cycle network within Hethersett such that proposed provision associated with other developments and existing provision are linked;
- Provision of enhanced cycle and pedestrian facilities and infrastructure;
- Provision of enhanced bus services and infrastructure;
- Provision of additional bus stops;
- Provision of enhanced facilities at nearby bus stops;
- Investment in additional cycle parking at Thickthorn Park & Ride;
- Implementation of a Travel Plan for all aspects of the proposed scheme, which could include the below measures to promote sustainable travel modes:
  - Promotion of car/ lift sharing;
  - Provision of a car club;
  - Promotion of electric bikes;
  - Travel Information Welcome Packs (to include sustainable transport information); and
  - Community Notice Board (to include sustainable transport information).
- Investment in local travel planning in the nearby residential areas to support generalised mode shift in Hethersett; and
- Potential contribution towards signalisation of the B1135 Tuttle Road East / Norwich Road / Norwich Common four-arm roundabout.
- Little Melton / Burnthouse Lane Priority T Junction visibility improvements
- Traffic calming in Little Melton and surrounding the Melton Road / Mill Road / School Lane / Burnthouse Lane Crossroads
- Potential mitigation at the priority T-junction at B1172 Norwich Road / Churchfields, which may be in the form of signalisation

In summary, the proposed scheme is deliverable in terms of transportation and offers a significant opportunity to provide new homes, education facilities and green infrastructure in a sustainable location which is accessible by sustainable modes to the existing nearby facilities and amenities and to key employment centres.

