



Carrow Works, Bracondale, Norwich, Norfolk  
Proposed residential-led mixed-use development

## **TRANSPORT ASSESSMENT**

**Prepared by:** Entran Ltd

**On behalf of:** Fuel Properties Ltd

**Date:** July 2022



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**GOLD AWARD**



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## 1.0 INTRODUCTION

### 1.1 Overview

- 1.1.1 This Transport Assessment (TA) has been prepared by Entran on behalf of Fuel Properties Ltd in support of a hybrid planning application (part outline, part full) for the proposed redevelopment of the Carrow Works site in Norwich, to provide a mixed-use development. Full details of the proposed development are included as Section 4 of this report.
- 1.1.2 The site falls within the jurisdiction of Norwich City Council (NCiC) who are the planning authority and Norfolk County Council (NCoC) who are the local highway authority.
- 1.1.3 A pre-application scoping note was submitted in May 2022, and pre-application meeting held with NCoC and NCiC in May and June 2022. This TA has been developed following those discussions with the highway authority; it takes account of the comments received as well as local and national guidance.

### 1.2 Policy and guidance

- 1.2.1 Guidance published by the DfT and the DCLG in 2007 provided advice on the content and preparation of Transport Assessments and Transport Statements. It also assisted stakeholders to determine whether an assessment may be required and, if so, what the level and scope of the assessment should be.
- 1.2.2 Previous guidance on the assessment of traffic implications associated with development proposals was contained in the “Guidelines for Traffic Impact Assessment” published by the Institute of Highways and Transportation (IHT). Since the IHT guidelines were produced, there has been a significant change in Government policy and general guidance regarding improved sustainability in transport. The fundamental difference between TAs and the old TIAs is that TAs seek to influence modes of travel and assess person-trips rather than vehicle trips, whereas TIAs were based on the principles of “predict and provide” for the private car.
- 1.2.3 In 2014 DCLG published a suite of Planning Practice Guidance including advice entitled “Travel plans, transport assessments and statements in decision taking”. The 2007 guidance has been formally superseded by the PPG as current government guidance on the transport related effects of development, but many highway authorities still refer to it as useful advice on detailed matters of transport assessment.
- 1.2.4 The NCoC publication “Safe, Sustainable Development: Aims and Guidance notes for Local Highway Authority requirements in Development Management” was revised in 2019. These guidance notes are in line with the National Planning Policy Framework (NPPF) and are intended to act as best practice and general guidance for use by local authorities, developers, designers, Councillors and the local community. The intention is to ensure good design is achieved, thereby improving the safety and quality of the places in which we live.

## 2.0 SITE LOCATION AND DESCRIPTION

### 2.1 Location

2.1.1 The Carrow Works site is located to the south of the River Wensum and forms part of the East Norwich Masterplan area. The masterplan area comprises of four key sites as shown in Figure 2.1.

Figure 2.1 – East Norwich masterplan area



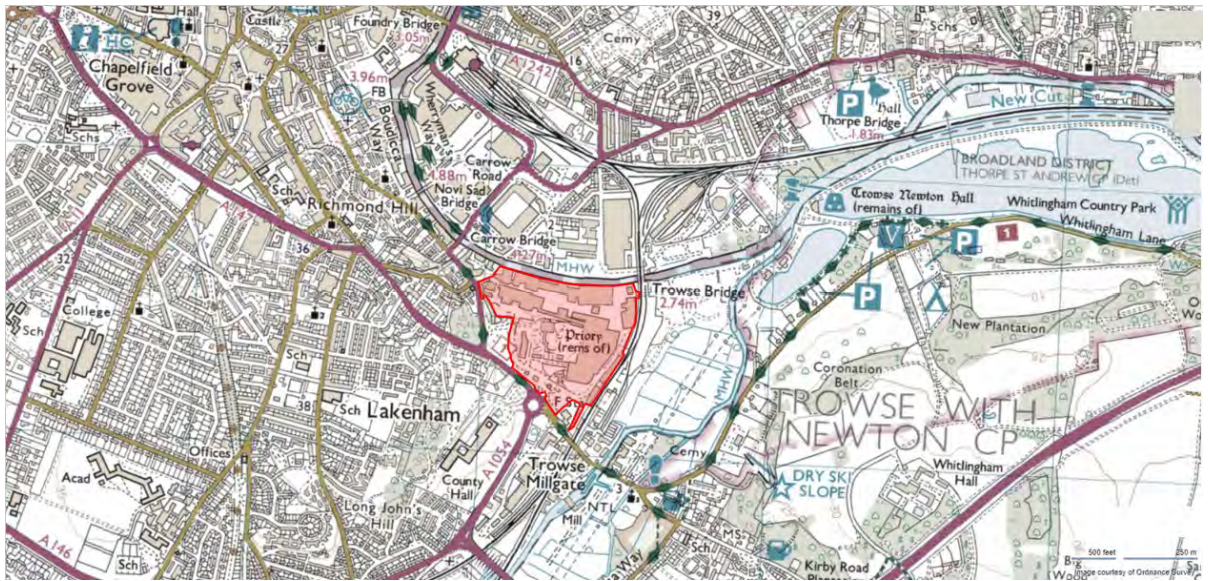
2.1.2 The East Norwich development represents a transformative opportunity for regeneration of this area and the wider city. It is an ambitious project to create a sustainable new urban quarter for the city, supported by the preparation of a joined-up development masterplan for east Norwich and a commitment to substantial future investment. The development of the masterplan is one of the eight projects funded by the Towns fund. <https://www.norwich.gov.uk/masterplan>

### 2.2 Existing land use

2.2.1 The Carrow Works site was home to the famous Norwich manufacturer, Colman's for 160 years. At its peak, the company employed 2300 people. Colman's became part of Unilever UK Ltd in 1995 after which the site was not only the home of Colman's mustard, but also Britvic soft drinks. The factory closed in 2020. The Carrow Works site is also home to the Grade I listed Carrow Abbey and the scheduled monument Carrow Priory ruins. The site location is shown in Figure 2.2 below.



**Figure 2.2 – Site location**



- 2.2.2 The site takes vehicular access from the ring road via the five-arm roundabout junction of Martineau Lane (A1054) and Bracondale (A147). Due to the former factory use, the access from Bracondale is 14m wide at the highway boundary, widening out within the site to effectively provide three barrier-controlled entry lanes and two barrier-controlled exit lanes. This is illustrated in the aerial image below.

**Figure 2.3 – Aerial image of existing site access**



- 2.2.3 The existing site access has footways on both sides but due to the former factory having intensive HGV usage, the pedestrian routes are protected from the carriageway by barriers. The pedestrian routes are safe but not particularly convenient. There are no segregated cycle routes.
- 2.2.4 Beyond the entry control barriers, an internal access road runs east and west from the control point and forms a complete circuit around the perimeter of the site.



- 2.2.5 The site also benefits from pedestrian, cycle and emergency access at the north-western corner via Paper Mill Yard, and pedestrian/cycle access at the north-eastern corner via an existing underpass beneath the rail line. There is a further emergency access at the south-east corner which emerges onto Bracondale adjacent to the Fire Station.
- 2.2.6 Further information on the history of the site is contained in the Design and Access Statement prepared by JTP Architects and information on the planning Use Classes and lawful use of the site is contained in the Planning Statement prepared by Turley Associates.
- 2.2.7 This complex site contains a wide range of buildings, some of which will be retained as part of the redevelopment, and some of which will be replaced. The buildings to be retained, and those to be demolished, are shown in **Appendix A**.



## 3.0 LOCAL TRANSPORT NETWORK

### 3.1 General

- 3.1.1 Bracondale is a classified road (which forms part of the A147 running north from the site into the City Centre. Some 250m north of the site access, the A147 diverges at a three-arm signal-controlled junction; Bracondale runs north-west towards the Bus Station and Notre Dame High School, and King Street runs north towards the City Centre. The A147 diverges again where Carrow Road heads north-east across Carrow Bridge towards Carrow Road football stadium and Riverside Retail Park. All roads to the north of the site access roundabout are subject to a 30mph speed limit and benefit from a comprehensive system of street lighting.
- 3.1.2 The site takes access from a five-arm roundabout at the junction of the A147 and the A1054. Two of the arms are named Bracondale, the A1054 is named Martineau Lane and the remaining two arms of the site access and the vehicle access into County Hall. There are splitter islands acting as pedestrian refuges on all five arms; there are uncontrolled pedestrian crossings on all arms. The roundabout is subject to a 40mph speed limit.
- 3.1.3 The south-eastern Bracondale arm heads over the rail line towards Trowse Newton but also provides access to the leisure uses at Norfolk Snowsports Club, Whittingham Country Park and Whittingham Broads.
- 3.1.4 Martineau Lane heads south-west to a three-arm signal-controlled junction with the A146. This forms part of the Norwich Ring Road and also provides a link to the A47, part of the trunk road network under the jurisdiction of National Highways.

### 3.2 Accessibility audit and Active Travel Zone assessment

- 3.2.1 Initial pedestrian, cycle and public transport audits have been carried out for the area surrounding the site.

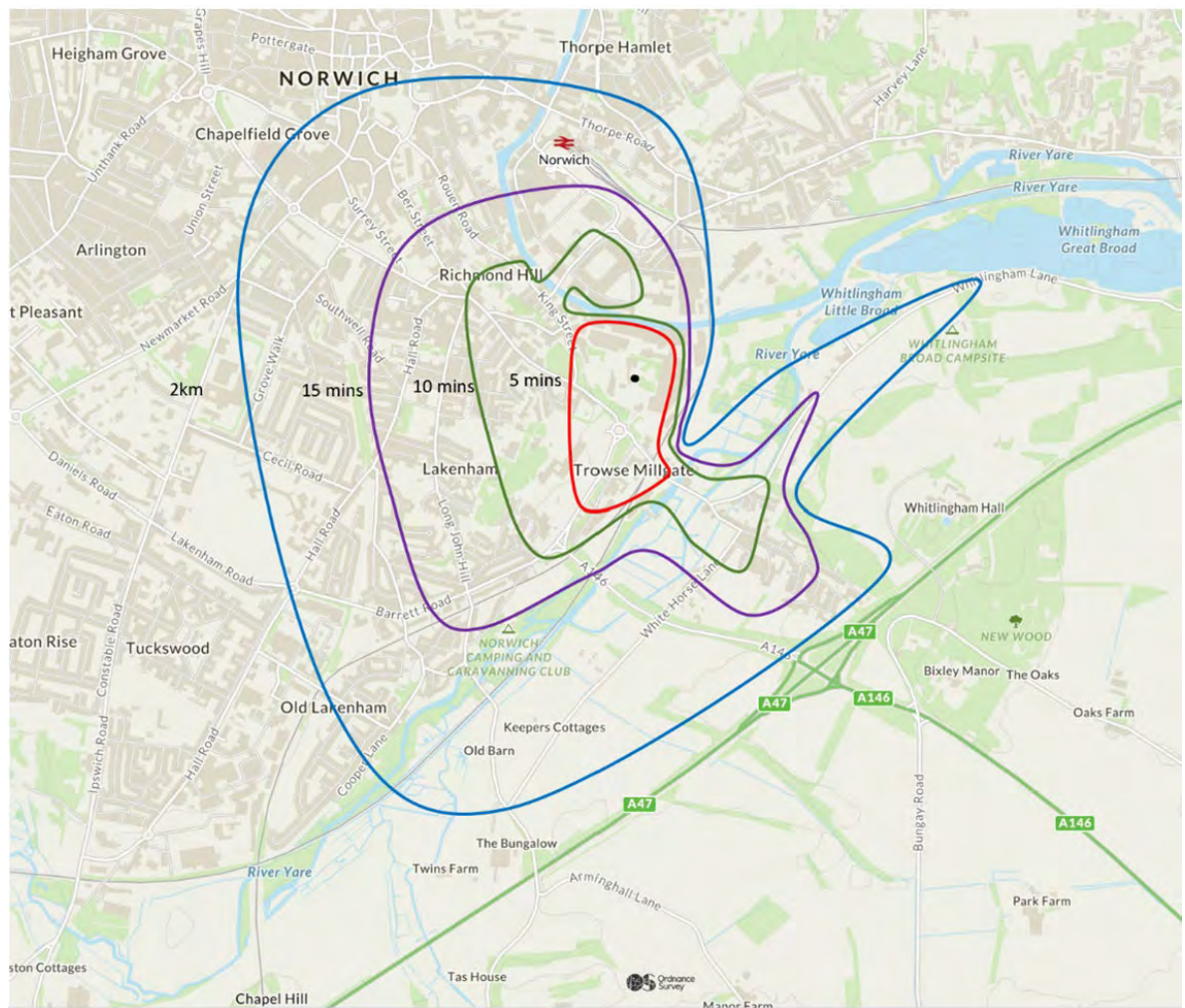
### 3.3 Pedestrian movement

- 3.3.1 Acceptable journey distances on foot vary depending on the purpose of the journey, the environment in which the journey is taking place and of course the individual walking. Prior to being superseded by the National Planning Policy Framework (NPPF), PPG13 suggested that walking offers the greatest potential to replace short car trips for journeys less than 2km. The IHT guide 'Providing for Journeys on Foot' suggests that for journeys to work a desirable walking distance would be 500m, an acceptable walking distance would be 1km and the preferred maximum walking distance would be 2km, in line with the PPG13 advice.
- 3.3.2 For security reasons, all pedestrian movement into the factory site has been via the main access on Bracondale. All staff and visitors have had to check in at the main gate security. The site previously had additional pedestrian access from Paper Mill Yard at the north-western corner, and a footbridge link to Carrow House. However, these accesses have been gated and are not currently accessible.
- 3.3.3 The main pedestrian routes to the site are via King Street and Bracondale to the north and west as well as a segregated route alongside Martineau Lane to the south-west. Surrounding the site there are key facilities within a suitable walking distance such as the local leisure centre, primary and secondary schools, a number of employment uses and the Riverside Retail Park with Morrisons supermarket approximately 1km away.
- 3.3.4 The footways either side of Bracondale and King Street are a minimum of 2m wide, generally in good condition and with relatively little clutter caused by street furniture. All pedestrian crossing points have flush dropped kerbs (max upstand 6mm) but not all crossing points have tactile paving.
- 3.3.5 The three-arm signal-controlled junction of Bracondale and King Street has central pedestrian refuges on the northern and western arms, but none on the eastern arm. There are dropped kerbs but no dedicated pedestrian crossing phases.
- 3.3.6 Approximately 160m north of the junction a pelican crossing provides a controlled crossing over King Street.



- 3.3.7 Further north again, the junction of King Street and Carrow Road has an uncontrolled crossing on the northern arm, but none on the eastern arm (Carrow Road) or southern arm.
- 3.3.8 Figure 3.1 below shows 5, 10 and 15-minute walking isochrones as well as a 2km walking distance, measured from the centre of the site.

**Figure 3.1 – Pedestrian isochrones.**

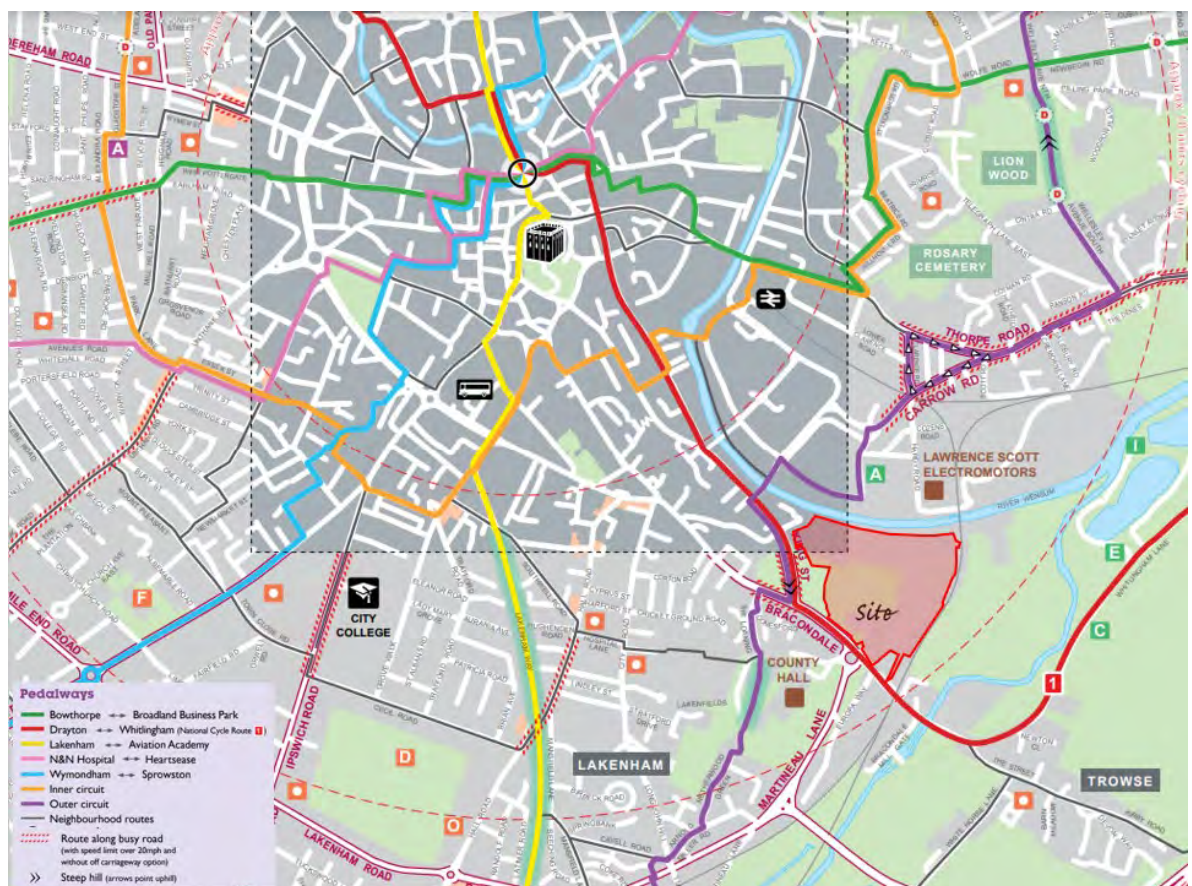


- 3.3.9 Figure 3.1 illustrates that the River Yare creates a degree of severance to the north and the rail line is a barrier to the east. Notwithstanding this, the Carrow stadium and its environs are within a 10-minute walk of the site. A large residential catchment in the Lakenham and Richmond Hill area are within a 15-minute walk of the site as is the Riverside retail park.
- 3.3.10 Measures to increase permeability across the river and the rail line would significantly improve the pedestrian catchment to the north and east of the site. This is covered in more detail in Section 9.
- 3.3.11 At present, Norwich station is slightly more than 15 minutes' walk from the site, but well within the 2km walking distance. Importantly, the main city centre with its range of retail, leisure and employment facilities is around 2km walking distance from the site.

### 3.4 Cycle movement

- 3.4.1 The National Cycle Network Route 1 (NCN1) runs past the south and west of the site and straight through the centre of Norwich; this national cycle route intersects multiple other cycle routes such as the inner circuit and the West to East route to access the majority of the city.
- 3.4.2 As it passes the site, NCN1 is in the form of a shared cycleway footway along the north-eastern side of Bracondale. NCN1 is a long-distance cycle route which runs in sections from Dover to the Scottish highlands; it is a much-loved and well used leisure route, however, locally it provides a direct and convenient route to Fakenham (north-west of Norwich) and Beccles (to the south-east). From Beccles, additional national routes run to Lowestoft and Southwold.
- 3.4.3 Figure 3.2 below is an extract from the Norwich Cycle Network plan and shows the site's proximity to the National Cycle Network and the network of local routes. The full plan is included as **Appendix B**.

**Figure 3.2 – Norwich cycle network (extract)**

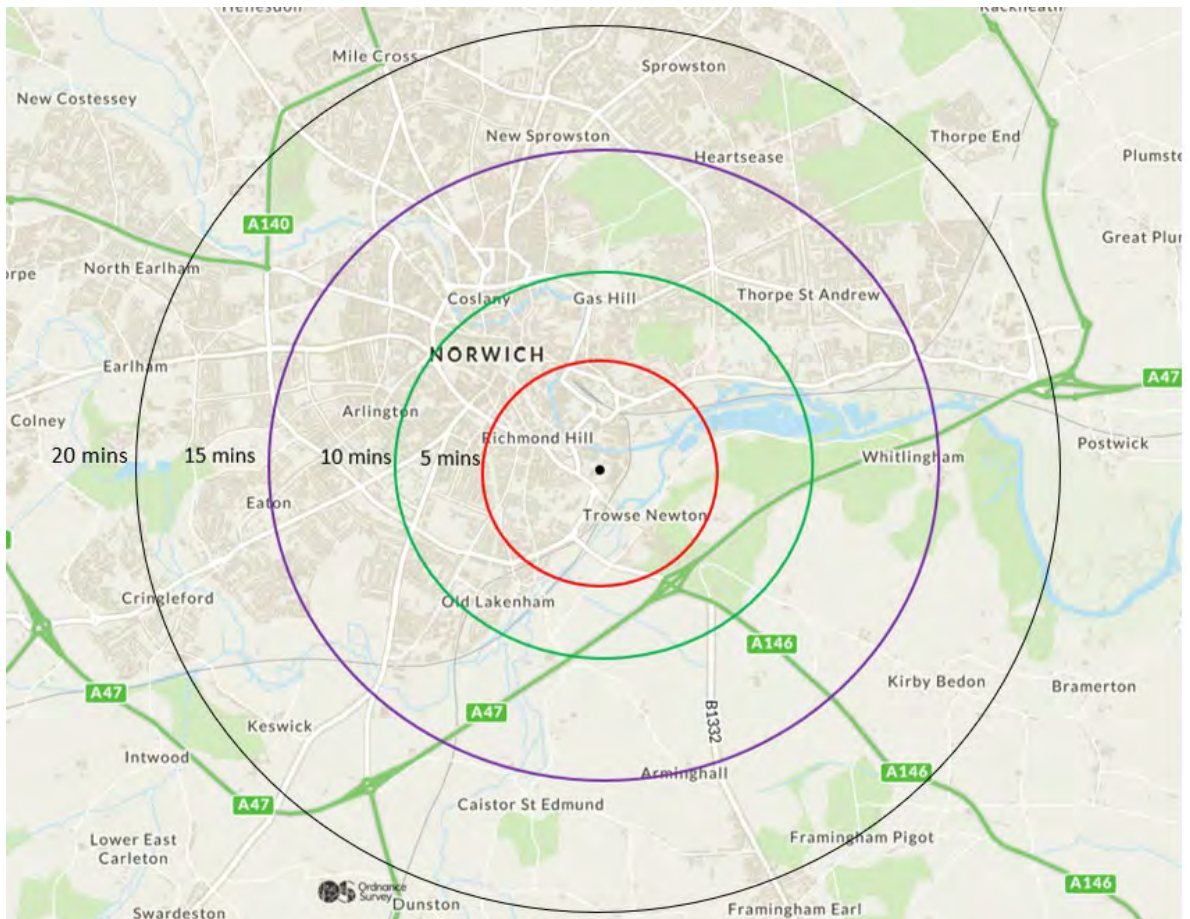


- 3.4.4 The outer circuit is located to the west of the site and runs along King Street (A147) and across Carrow Bridge. The outer circuit as the name would suggest runs around the outer parts of the city.
- 3.4.5 Figure 3.2 (and the plan at Appendix B) shows that both NCN1 and the outer circuit are described as a “route along a busy road” at the junction of Bracondale and King Street.

Figure 3.3 below shows 5, 10, 15 and 20-minute cycle isochrones.

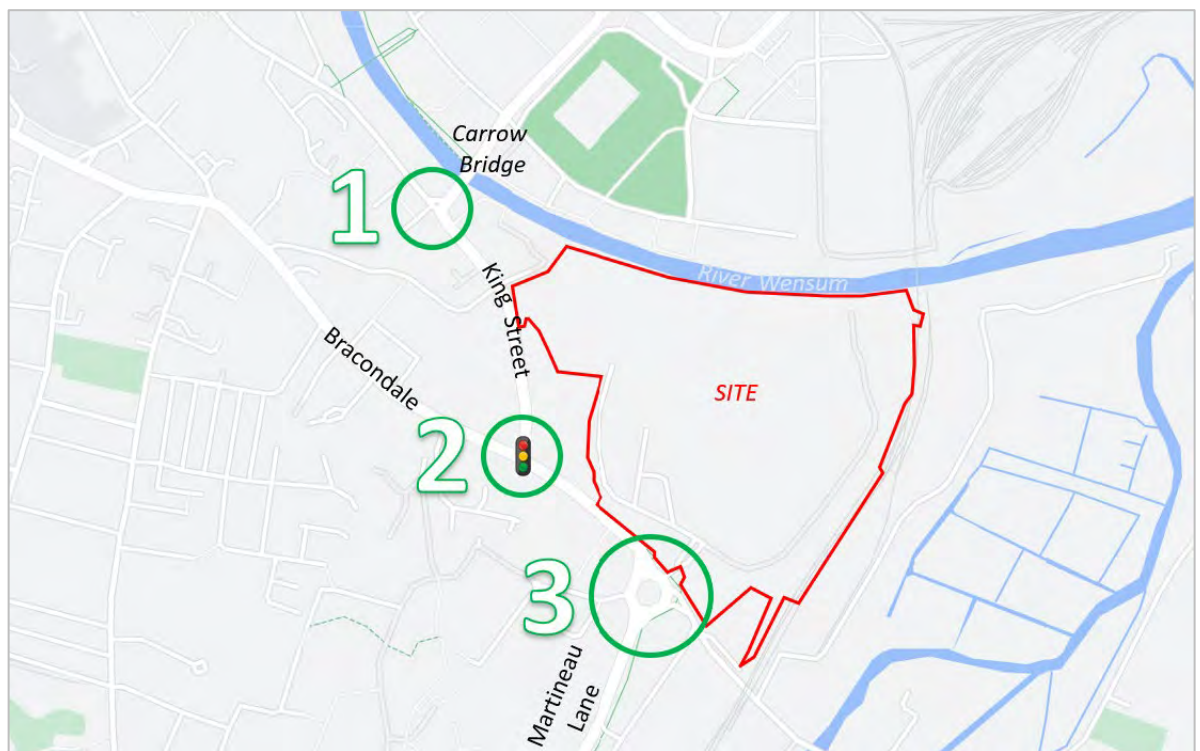


**Figure 3.3 – Cycle isochrones**



- 3.4.6 This illustrates that the city centre lies within easy cycling distance of the site and that a large area of Norwich can be reached from the site by bike within 20 minutes.
- 3.4.7 The combination of the National Cycle Network, local cycle routes and lightly trafficked residential roads make the Carrow Works site an excellent location to promote travel by bike.
- 3.4.8 During scoping discussions NCoC identified three junctions where cyclists currently experience delay, difficulties in crossing the carriageway or intimidation from traffic on busy roads. These are illustrated in Figure 3.4 below.

**Figure 3.4 – Existing junctions identified by NCoC as requiring improvement for cyclists**



3.4.9 The three junctions are:

1. King Street j/w Carrow Road – simple priority junction (no right turn from Carrow Road during weekday peak hours)
2. King Street j/w Bracondale – signal-controlled junction
3. Bracondale j/w Martineau Lane – five-arm roundabout

3.4.10 It is noted that these three junctions are located on the route of NCN1 and form the main cycling route from the site to the city centre. They also form the main cycling route from County Hall to the city centre. During scoping discussions, Entran requested details of any previous feasibility studies that had been carried out by NCoC to improve walking and cycling facilities in these locations, but none were forthcoming.

3.4.11 Further details of the assessment of improvement options are provided in Section 9.

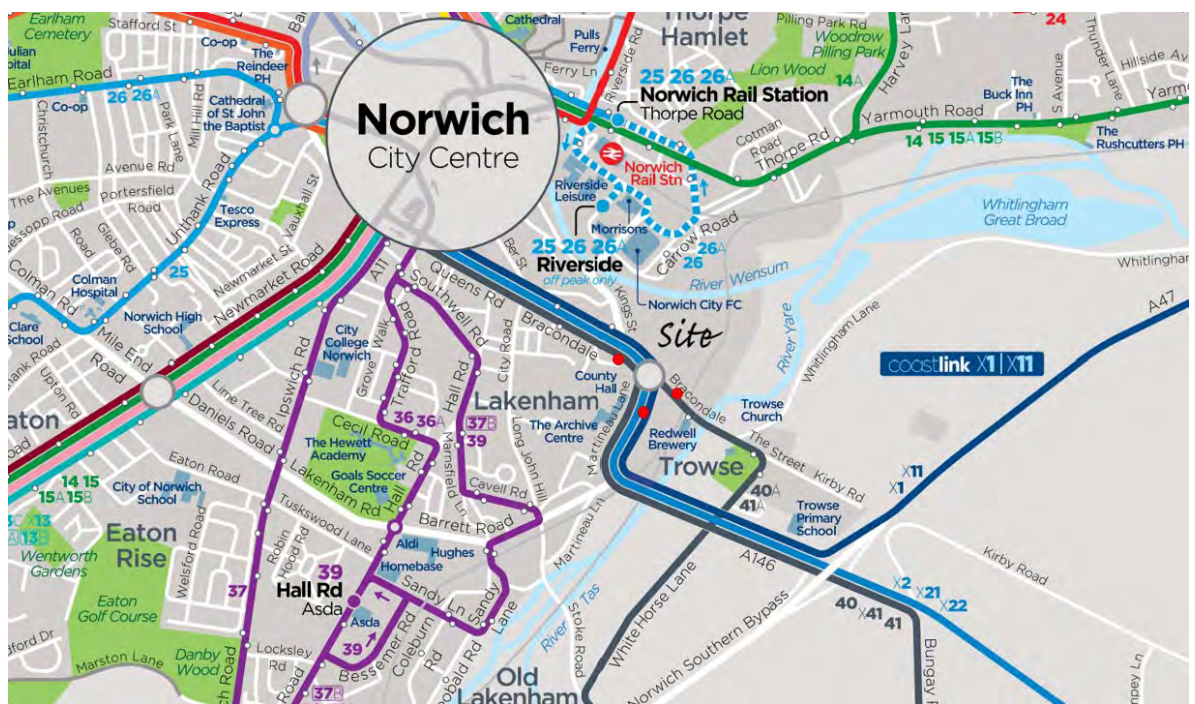
### 3.5 Public transport

3.5.1 Three bus stops are located to the South of the site. These are shown in red in Figure 3.3 below. A northbound stop is located on Bracondale outside County Hall (Stop D). This bus stop has a dedicated layby but no shelter or seating. A southbound bus stop is located on Bracondale to the south-east of the roundabout (The Street), but this is served by a limited number of routes. An additional southbound stop is located on Martineau Lane (County Hall); this stop has a shelter, seating and timetable information. All three stops are within a 5-minute walk from the centre of the site.





**Figure 3.5 – Local bus routes and stops.**



3.5.2 The full bus network plan is included as **Appendix C**. The bus routes serving these bus stops are summarised below (full bus timetables can be found on the NCoC website).

**Table 3.1 – Bus route summary**

No	Details	Duration	Frequency
85	Norwich-Claxton (Our bus)	0730-1700	1hr
86	Beccles-Norwich (Our Bus)	0700-1400	3 hours
146	Norwich – Southwold (Border bus)	0900-1900	30 mins
X2	Norwich – Lowestoft (First Norfolk and Suffolk)	0830-1900	30 mins
X21	Norwich- Lowestoft (First Norfolk and Suffolk)	0700-0830 1800-2030 2300	1hr20
X22	Norwich – Lowestoft (First Norfolk and Suffolk)	0700--2000	30 mins
X1	Norwich – Lowestoft (First Norfolk and Suffolk)	0700-2300	30 mins
X11	North-Belton (First Norfolk and Suffolk)	0745-1915	30 mins
40	Norwich-Poringland (First Norfolk and Suffolk)	0815-1700	1hr
41	Norwich- Bungay (First Norfolk and Suffolk)	0845-1700	2hr
X41	Norwich-Bungay (First Norfolk and Suffolk)	0745-1750	2hr
41A	Norwich-Bungay (First Norfolk and Suffolk)	1730-2230	1hr

3.5.3 Figure 3.5 and Table 3.1 illustrate that the site is well served by a range of existing bus services operating throughout the day to a wide catchment. A number of the services operate at a 30-minute frequency which is sufficient for passengers to simply turn up to a bus stop and catch the next bus rather than having to plan their journey around the timetable.

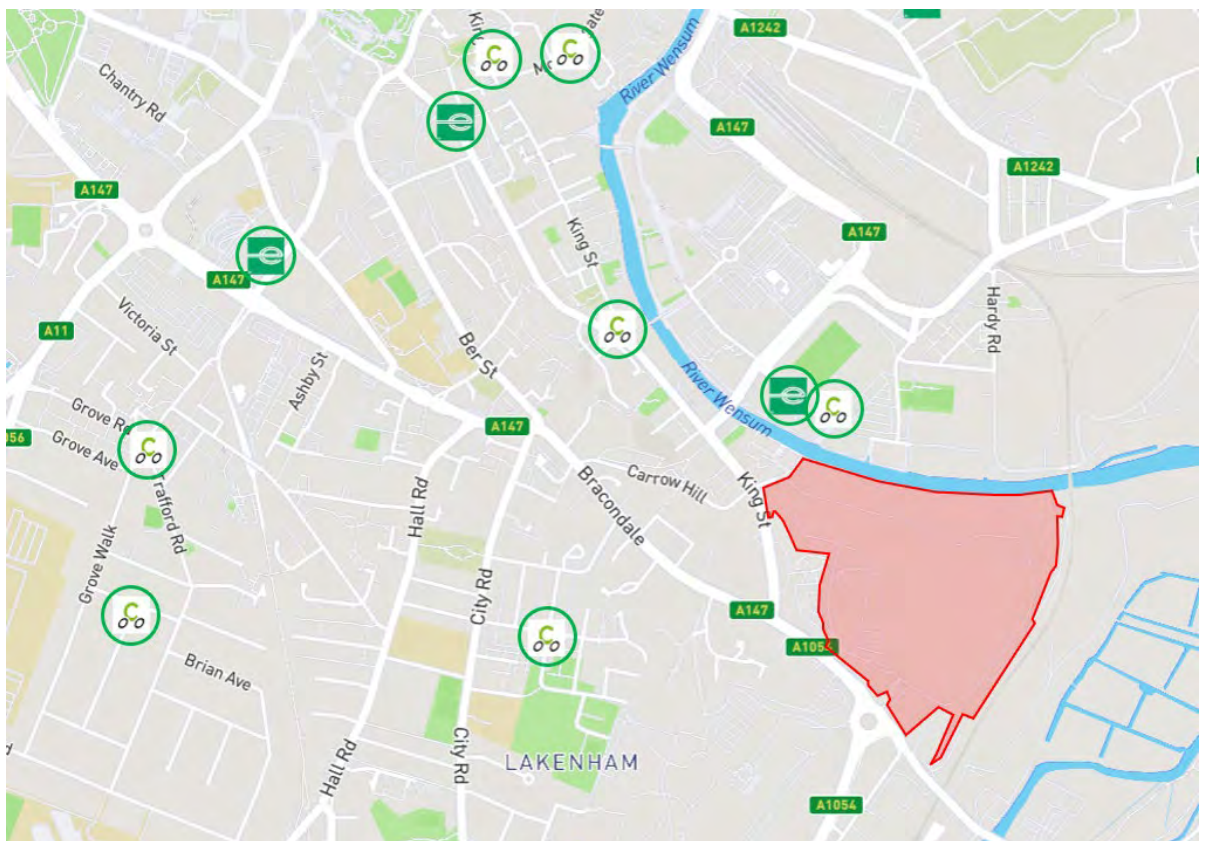


- 3.5.4 The nearest rail station is Norwich, some 1.2km to the north of the site. This is a within a 20-minute walk or 5-minute cycle. Norwich station benefits from a bus terminus and secure covered cycle parking. Trains from Norwich provide direct links to Stansted airport (2hr), London Liverpool Street (2hr), Great Yarmouth (35 mins), Sheringham (1hr), Lowestoft (45 mins) and Liverpool Lime Street (5hr 30 mins). This provides a wide catchment area for daily commuters and UK-wide travel connections.

### 3.6 Car Clubs

- 3.6.1 There are currently 109 Car Club vehicles in operation across Norwich. These are generally operated by Co-wheels and Enterprise Car Club. The closest of these are located on Geoffrey Watling Way next to the Carrow Road Stadium.

**Figure 3.6 – Existing Car Club locations**

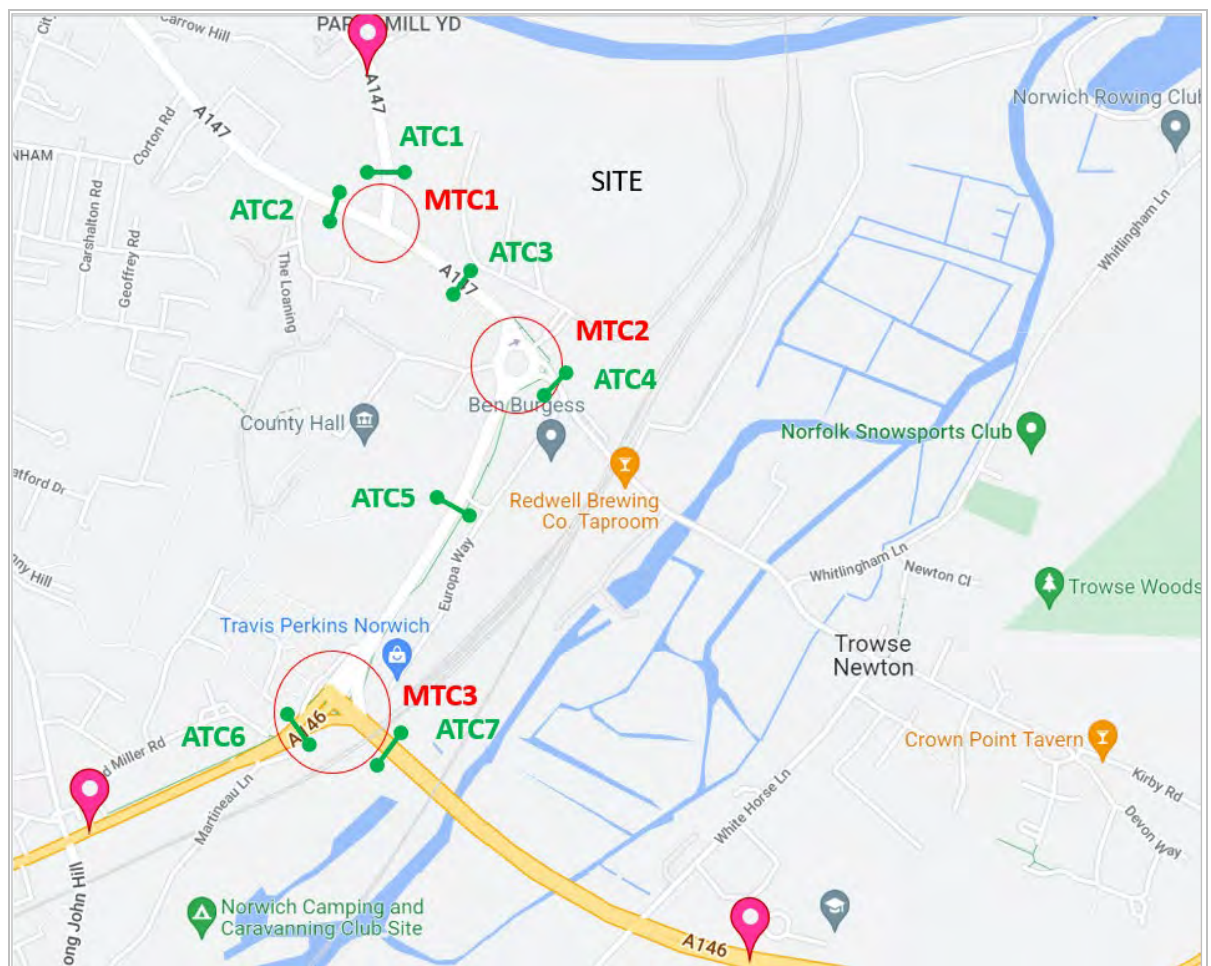


- 3.6.2 It is clear that ample opportunities exist to travel to and from the site by foot, by bike, or using local public transport. This is a good site to promote sustainable travel and reduce reliance on the private car.

### 3.7 Baseline highway conditions

- 3.7.1 A number of traffic surveys have been undertaken on the surrounding highway network. A set of automatic traffic counters (ATCs) were installed to record 14 days of classified direction vehicle flows, including vehicle speeds in seven locations surrounding the site. These are supported by manual peak hour turning counts (MTC) at three junctions. The survey locations are shown below and at **Appendix D**.

**Figure 3.7 – Traffic survey locations**



- 3.7.2 The surveys were undertaken during a neutral month and avoiding school holidays. They were carried out during morning and evening peak periods (3 hours each) and across a Saturday lunchtime (4 hours). The ATCs include a Saturday during which Norwich City FC were playing a home game, and a Saturday when they were not. The combination of ATC and MTC data allows for peak hour junction capacity analyses to be carried out at the three junctions and to establish any proportional increase in vehicle movements beyond this study area.
- 3.7.3 Three permanent traffic count sites (shown pink in Figure 3.7) provide annual average daily flows (AADF) from 2000 to 2020. These show a marked reduction in 2020 due to the global pandemic; however, the available information from 2000 to 2019 allows an assessment of the ATC data to compare traffic flows in April 2022 to pre-pandemic conditions. This demonstrates that the observed daily flows in April 2022 were generally equivalent to the 2019 AADF. The only exception was that the data from ATC7 (A416 link road) was approximately 11% lower than the 2019 AADF for that link.
- 3.7.4 The observed daily flows are summarised in Table 3.2 below:

**Table 3.2 – Observed daily traffic flows**

	Road Name	24hr AADT
1	A147 King Street	22193
2	A147 Bracondale	16447
3	A147 Bracondale	21902
4	Bracondale (south)	5130
5	A1054 Martineau Lane	27891
6	A146 Barrett Road	16321
7	A146 (link road)	31373



## 4.0 PROPOSED DEVELOPMENT

### 4.1 General

4.1.1 A hybrid planning application is being submitted that seeks outline planning permission for the majority of the site but full planning permission for part of the site, including the setting of the listed buildings and the primary access road. Means of access will not be a reserved matter for the outline application. The planning boundaries are shown in **Appendix E**.

4.1.2 The description of development is:

Detailed (full) component

*“Full application comprising the construction of the principal means of access, the primary internal road and associated public spaces and public realm, including restoration and change of use of Carrow Abbey to former use as residential (Use Class C3), alteration and extension and conversion to residential use (Use Class C3) of the Lodge, Garage and Gardener’s Cottage and the Stable Cottages, development of the former Abbey Dining Room for residential use (Use Class C3), adaptation and conversion for flexible uses (Class E and/or and/or C2 and/or and/C1 and/or C3 and/or F1 and/or F2 and/or B2 and/or B8 and/or Sui Generis) for buildings 207, 92, 206, 7 (7a, 8 and 8a), 209, 35, the Chimney and Class E and/or B2 and/or B8 for the retained Workshop (Block 258), enhanced access to Carrow Abbey and Scheduled Ancient Monument and associated ancillary works.”*

4.1.3 The full component of the application covers a site area of 5.02 ha.

Outline component

*“Demolition of existing buildings and replacement with phased residential-led (Use Class C3 and/or Class E and/or F1 and/or F2 and/or C1 and/or C2 and/or B2 and/or B8 and/or Sui Generis), landscaping, open space, new and modified access, car parking and ancillary works.”*

4.1.4 The outline component of the application covers a site area of 11.9 ha.

4.1.5 A JTP Architects illustrative masterplan is included as **Appendix F**. This shows the site sub-divided into six-character areas. The Bowles and Wyer landscape layout is also included in **Appendix G**.

4.1.6 The illustrative masterplan includes 1855 new homes as follows:

**Table 4.1 – Proposed residential accommodation**

Dwelling type	Number
Refurbished apartments	125
New build apartments	1338
Refurbished houses	6
New build houses	386
<b>TOTAL</b>	<b>1855</b>

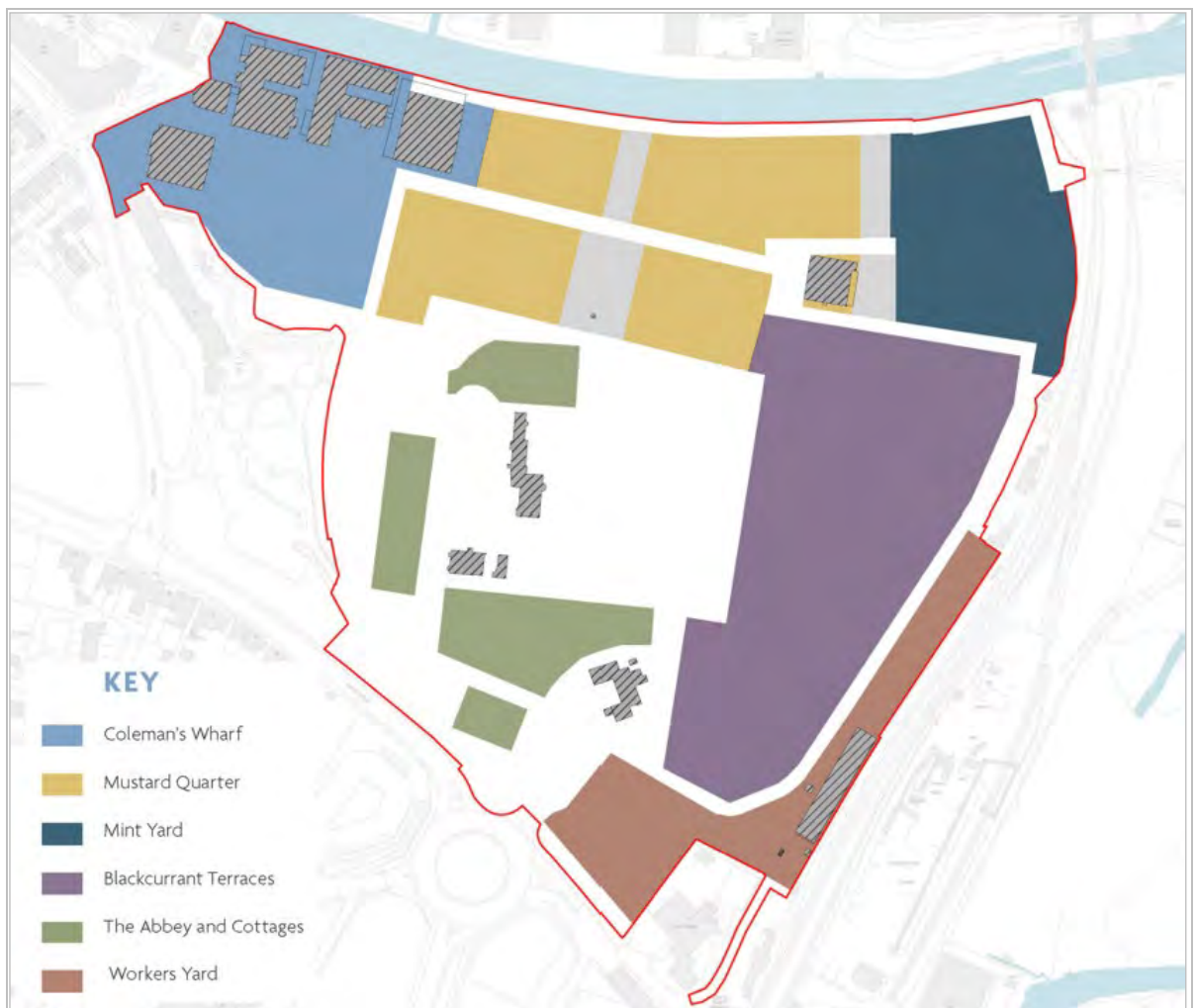
4.1.7 In addition to the new homes, the development will deliver a range of commercial, and employment uses falling within Use Class E/F/B1 (commercial) and B2/B8 (industrial). The illustrative masterplan includes the following non-residential floorspace areas.



**Table 4.2 – Proposed non-residential uses**

Use	GIA (m <sup>2</sup> )
Commercial (E)	23,273
Industrial (B2/B8)	3003
<b>TOTAL</b>	<b>1855</b>

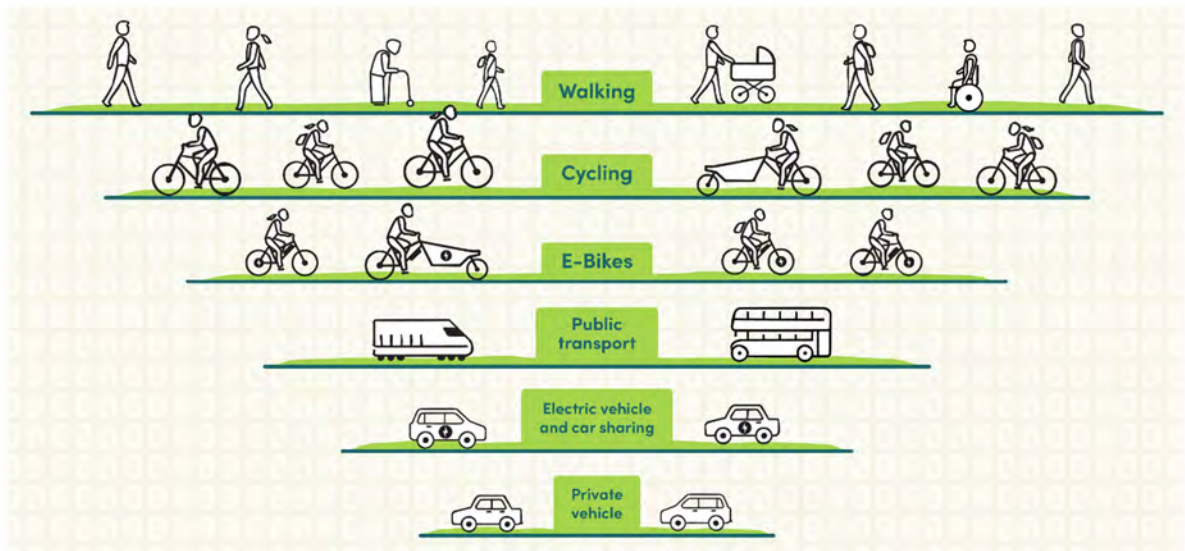
- 4.1.8 A series of accommodation schedules and plans showing the building references is included as **Appendix H**.
- 4.1.9 Due to the hybrid nature of the planning application, a Design Code has been developed which defines a series of Character Areas across the site. These reflect the relationship with the Abbey Grounds and Garden as well as the importance of the River Wensum and the different characters that will be developed through building types and street scene. This is of course relevant to the building types and landscape design but will also relate to the road types and street design. This is addressed further below.

**Figure 4.1 – Character areas.**

## 4.2 Movement strategy

4.2.1 The Movement Strategy has been devised around the following hierarchy of movement as set out in national and local policy and guidance.

Figure 4.2 – Movement strategy



4.2.2 A plan illustrating the Movement Strategy is included as **Appendix I**.

### Pedestrians and cyclists

- 4.2.3 The layout has been designed to be highly permeable for pedestrians and to provide safe routes for cyclists. The pedestrian/cycle routes radiate outwards from the site to link to existing infrastructure as well as proposed or potential routes linking to the City Centre.
- 4.2.4 The landscape treatment of the Abbey Grounds is highly sensitive and is being designed by Bowles & Wyer. This is relevant to the Movement Strategy in that the design includes some private space, some semi-private space and some public space. The pedestrian routes through those spaces will therefore have different levels of restriction, appropriate to the setting of the listed building.
- 4.2.5 A key element of the East Norwich Masterplan is the opening up of the riverside for public access. The illustrative masterplan shows a new riverside pedestrian/cycle route through the Railway Side, Waterside and Gateway areas, linking to Paper Mill Yard and King Street via a series of new public squares in the Gateway area. This route is shown dashed red in Figure 4.2.
- 4.2.6 A parallel east/west route is shown dashed blue. This key route, known as Mustard Mill Way, will be a semi-pedestrianised 'balanced street' which provides a safe route for pedestrians and cyclists but also serves as vehicular access to the northern part of the development.

**Figure 4.3 – Riverside access and east/west links**



- 4.2.7 A new pedestrian/cycle bridge over the River Wensum is shown at location B and is referred to in the East Norwich Masterplan. The delivery of this bridge forms part of the development proposal but is subject to approval from a third-party landowner in respect of the bridge-landing on the northern side of the river; however, land has been safeguarded within the site to ensure the southern bridge-landing is within the control of the Carrow Works site. The delivery of the bridge is expected to be secured by means of a Section 106 agreement.
- 4.2.8 The existing subway beneath the rail line is at location C. A number of options are being explored with NCoC to upgrade the subway to provide a pedestrian/cycle link between Carrow Works and Deal Ground. Those discussions are ongoing and are described in **Appendix J**. The upgrading of the subway forms part of the proposed development and is expected to be secured by means of a Section 106 agreement.
- 4.2.9 The movement strategy ensures high quality pedestrian/cycle routes will be delivered between points A, B and C.
- 4.2.10 As discussed in Section 3, NCoC identified three off-site road junctions which fall on the primary desire line between the site and the city centre, and which they consider deter cycle usage in their current form.

#### Public transport

- 4.2.11 During scoping discussions, two options were considered to make the scheme highly accessible for bus passengers; Option 1 included a new Bus Hub within the site, close to Bracondale (whole development within 400m of the Bus Hub); Option 2 allowed buses to circulate around the perimeter road with simple stops along the way, generally at 400m intervals. Option 2 has been progressed with buses entering the site and circulating in an anti-clockwise direction. The provision of three bus stops within the site will ensure the entire development is within 200m of a bus stop as shown below.



**Figure 4.4– Proposed bus stop locations**



- 4.2.12 The internal circular bus route is 1.2km long which equates to 2.5 minutes of driving time plus an average of 3 minutes of boarding/alighting time. The inclusion of bus stops within the development therefore requires a 5½ minute extension to the existing bus routes that would divert into the site. Border Bus and First (Norfolk & Suffolk) have been contacted with regards to extending routes 146 and X22 respectively. At the time of writing no formal agreement has been reached with the bus companies; however, the provision of high-quality bus infrastructure as part of the proposed development is a key element of the proposed movement strategy.
- 4.2.13 A vehicle swept path analysis using the proprietary software AutoTrack is included as **Appendix K**.



**Figure 4.5 – Bus Shelter**

### 4.3 Parking

- 4.3.1 Policy DM31 of the adopted Local Plan is entitled 'Car parking and servicing'. It states that car parking should be provided within the minimum and maximum levels set out in Appendix 3; that cycle parking should be provided to at least the levels prescribed; that the required provision should be made for disabled drivers and that provision should be made for electric vehicle charging points (EVCP). It states that parking restraint should be provided in areas of high accessibility.
- 4.3.2 Policy DM32 is entitled 'Encouraging Car Free and Low Car Housing'. It states that residential development must be car-free on sites identified in the Site allocations plan for car-free housing, within the city centre primary retail area and on sites within a controlled parking zone, and where vehicle access cannot be provided under DM30. The Carrow Works site does not fall within these categories.
- 4.3.3 DM32 also states that car-free or low-car housing will be acceptable in the controlled parking zones and city centre; other sites within 200m of a bus stop offering a service to the city centre of at least 10 minutes, or other sites within or adjacent to district centres where low-car housing can contribute to the beneficial reuse and regeneration of vacant or underused buildings (subject to the provisions of policy (DM21).
- 4.3.4 DM32 also states that the provision of Car Club spaces will be taken into account in assessing any proposal.
- 4.3.5 In line with the requirements of the NPPF, the parking standards vary depending on the location and accessibility of the development. The Carrow Works site is outside the city centre and not currently within a CPZ; however, as a core component of the East Norwich regeneration area it is appropriate for the parking provision to reflect the nature of the area once it has been redeveloped rather than the area as it currently is.
- 4.3.6 Taking full account of the above, the proposed parking provision is as follows:

**Table 4.3 – Proposed parking provision**

Use	GIA (m <sup>2</sup> )
<b>Flats</b>	0.2 spaces per dwelling
<b>Houses</b>	1 space per dwelling
<b>Commercial (E)</b>	1 space per 500m <sup>2</sup>
<b>Industrial (B2/B8)</b>	1 space per 750m <sup>2</sup>
<b>Foodstore</b>	1 space per 50m <sup>2</sup>



- 4.3.7 When the above parking ratios are applied to the proposed development, the parking requirements and provision are as shown below.

**Table 4.4 – Proposed parking distribution**

	Area	Refurb Apart	NB Apart	Refurb Houses	NB Houses	Resi total	Comm' l sqm	Ind'l sqm	P reqd	P prov
1	Gateway	125	50			175	15319		61	<b>0</b>
2	Waterside		556			556	3716		102	<b>74</b>
3	Railway Side		325			325	234		57	<b>45</b>
4	Build to Rent		250			250			44	<b>68</b>
5	Private Housing		77			77			13	<b>26</b>
6	Housing area 1				110	110			110	<b>110</b>
7	Housing area 2				234	234			234	<b>234</b>
8	Abbey Grounds			6	15	21			21	<b>21</b>
9	Abbey Gardens		18		27	45			30	<b>27</b>
10	Food store & employment		62			62	2030	3003	55	<b>129</b>
11	Mustard seed driers					0	1974		4	<b>0</b>
		<b>125</b>	<b>1338</b>	<b>6</b>	<b>386</b>	<b>1855</b>	<b>23273</b>	<b>3003</b>	<b>733</b>	<b>734</b>

- 4.3.8 The proposed development will provide a new Car Club and will provide car club spaces in publicly accessible locations. The strategy is to provide one car club space for every 200 dwellings from the outset but make provision for one space per 100 dwellings subject to demand. This equates to an initial 9 car club spaces, potentially doubling to 18.
- 4.3.9 Research by the independent charity CoMoUK suggests that one car club vehicle removes up to 20 private cars from the streets. The proposed level of car club provision therefore equates to 180 to 360 private parking spaces.
- 4.3.10 All eligible new residents within the Carrow Works development will be provided with free Car Club membership but the Car Club vehicles will be available to the wider local community, thereby reducing parking demand beyond the boundaries of the development.
- 4.3.11 Each planning Use Class has different parking standards for disabled drivers, EVCP and cycle parking provision.
- 4.3.12 Parking provision for disabled drivers will be provided in accordance with the standards. For Class E and B, 5% of total spaces will be allocated for disabled parking.
- 4.3.13 EVCP will be provided in accordance with the standards. For class E and B uses, one parking space will be provided with electric charging point plus one for every 5000m<sup>2</sup>. With regards to residential, a minimum of one space will be provided with an electric charging point in all communal unallocated parking areas and in all garages.
- 4.3.14 Cycle parking provision will be provided in accordance with the Local Plan standards. All long-stay cycle parking for flats will be provided in cycle stores within the building. Long stay cycle parking for houses will be provided in garages or storage areas. Short stay cycle parking will be in the form of Sheffield loop stands, incorporated into the landscaping.
- 4.3.15 For Class E, staff should be provided a secure cycle parking space per 100m<sup>2</sup>. Customers should be provided one cycle space per 50m<sup>2</sup> adjacent to principal entrances or nearby if on the highway. Class B, staff should be provided with one covered and secure cycle parking space per 75m<sup>2</sup>. Customers

should be provided with one cycle space per 500m<sup>2</sup>. For residential, covered and secure cycle storage space must be provided. 1 bed units: 1 space, 2 and 3 bed units: 2 spaces: 4+ bed units: 3 spaces.

#### 4.4 Means of access

- 4.4.1 The scoping note prepared by Entran in May 2022 suggested that the development would retain the existing primary access from the Bracondale roundabout but re-modelled in order to provide two separate carriageways. This would remove the need for a second vehicle access (other than emergency access via Paper Mill Yard). The principle of parallel carriageways has been tested and delivered in a number of locations as illustrated below.

**Figure 4.6 – Example of parallel access carriageways**



- 4.4.2 The development illustrated above was built on a former British Rail train yard and exceeded the conventional threshold for a single point of access. As a result, the access was designed with one entry carriageway and one exit carriageway with a landscaped median separating the two. The length is deliberately as short as possible and then within the site an internal loop road ensured every resident has two routes to the public highway.
- 4.4.3 The design of parallel carriageways allows for a landscaped access with good provision for pedestrians and cyclists. Each carriageway is 5.5m wide but incorporates 300mm blockwork channels to deliver an element of visual thinning. The purpose of parallel carriageways is to ensure that if in the unlikely event, one carriageway becomes blocked, the other carriageway is wide enough to act as a temporary two-way access and egress. The short length and careful placing of public utilities means that this eventuality is very unlikely, but the design allow for worst case planning.
- 4.4.4 If this approach was to be applied to the Carrow Works site, the access would look as follows:



**Figure 4.7 – Carrow Works parallel carriageway initial design concept.**



- 4.4.5 This shows that the access could incorporate 3m wide footway/cycleways on both sides within a newly landscaped setting. This would be a pleasant and convenient access for pedestrians and cyclists, would form a landscaped ‘gateway’ into the development and would make safe provision for all residents and businesses to enter and leave the site, even if one of the carriageways were to become obstructed.

#### Secondary access

- 4.4.6 However, notwithstanding this explanation, NCoC rejected the concept of parallel carriageways as the sole vehicular access to the side and directed the developer to investigate options for providing a secondary access. Four secondary access options were considered:
- Paper Mill Yard
  - Carrow House
  - Bracondale
  - South-eastern access
- 4.4.7 **Paper Mill Yard** is a private road. It was formerly part of the public highway but was ‘stopped up’ some considerable time ago. The developer has a legal right to use Paper Mill Yard for emergency access and for pedestrians and cyclists; they have no general legal right of vehicle access across this third-party private land.
- 4.4.8 The existing emergency access is denoted on the ground by yellow box junction markings and is to be retained as a pedestrian/cycle access which also serves as access for emergency vehicles.

**Figure 4.8 – Emergency access via Paper Mill Yard**



**Figure 4.9 – Paper Mill Yard images**



Paper Mill Yard (private street)



Existing emergency access from Paper Mill Yard

- 4.4.9 **Carrow House** is located to the west of the site and has an internal access from the Carrow Works perimeter Road. That access is currently gated but could be re-opened. Carrow House has two gated accesses onto King Street; both are single-width and therefore operate as separate access and egress. The access is 27m from the stop line of the King Street / Bracondale signal controlled junction; the egress is approximately 90m further north.
- 4.4.10 The internal road between the access and egress passes in front of Carrow House's main entrance and all vehicles leave the site via this route. The narrow egress has limited visibility to the back edge of footway and does not have the required 2.4m x 43m intervisibility between drivers. This egress would therefore need significant remodelling if it were to form any part of the Carrow Works means of access.



**Figure 4.10 – Carrow House existing accesses**



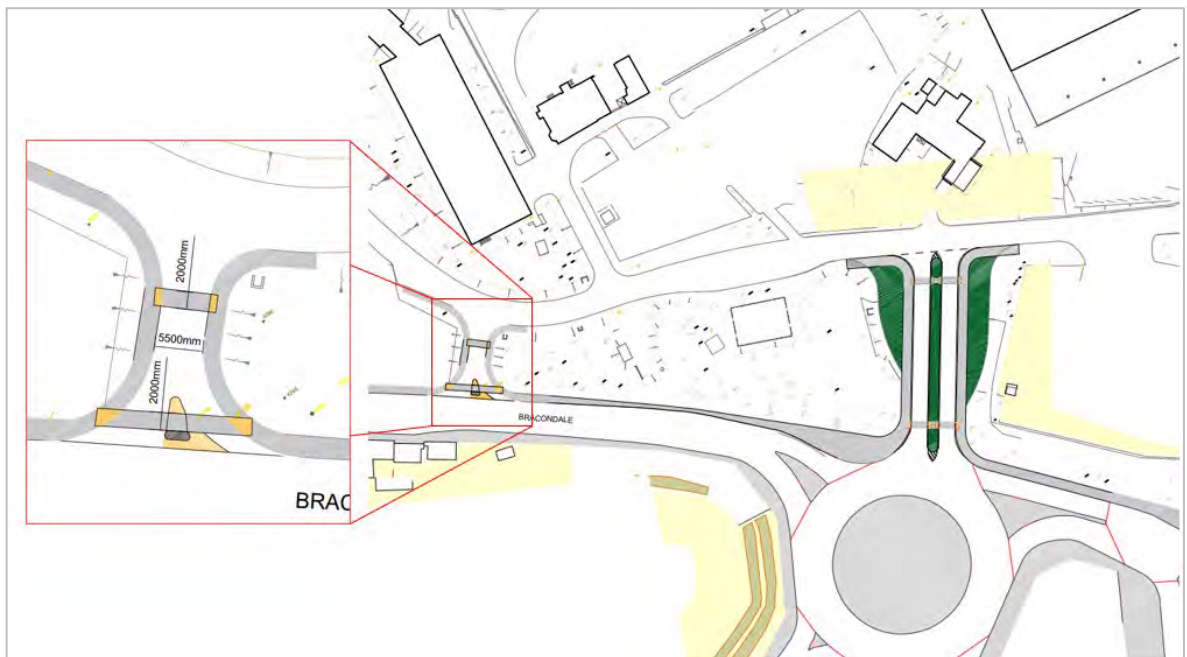
Carrow House access from King Street



Carrow House access from Carrow Works internal road

- 4.4.11 Of greater significance is the fact that the link road between the Carrow Works perimeter Road and the Carrow House access/egress passes directly through the Carrow House car park. This would be unsuitable even as a secondary access into the Carrow Works development and would therefore require the Carrow House car park to also be remodelled in order for this route to be used as means of access to the Carrow Works development
- 4.4.12 If general access were permitted into the Carrow Works site via Carrow House, this would be a more attractive route into (and potentially out of) the site for those travelling to and from the city centre This could therefore draw a significant level of additional daily vehicle movements through the Carrow House site.
- 4.4.13 It is important to note that the Carrow House land is also in private ownership (albeit public sector) and would therefore require that land to be incorporated within the planning boundary.
- 4.4.14 This is therefore feasible in principle but would be a very expensive option and unnecessarily complex if a suitable alternative were available.
- 4.4.15 A secondary access onto **Bracondale** could be delivered within land under the developer's control and public highway. It would not be desirable to provide an all-movements junction onto Bracondale, so a simple left-out design would restrict the general use of this secondary access. Vehicles turning left in would have no material effect on the operation of Bracondale; drivers are unlikely to turn left out as they would have to give way onto Bracondale and then give way at the roundabout. Drivers are also unlikely to turn right in, across opposing traffic when it would have been simpler to enter via the main access from the roundabout. Under normal conditions this would therefore be a lightly used access; however, if the main access were to be obstructed this would be a suitable temporary access to allow residents and businesses to gain access to the site.

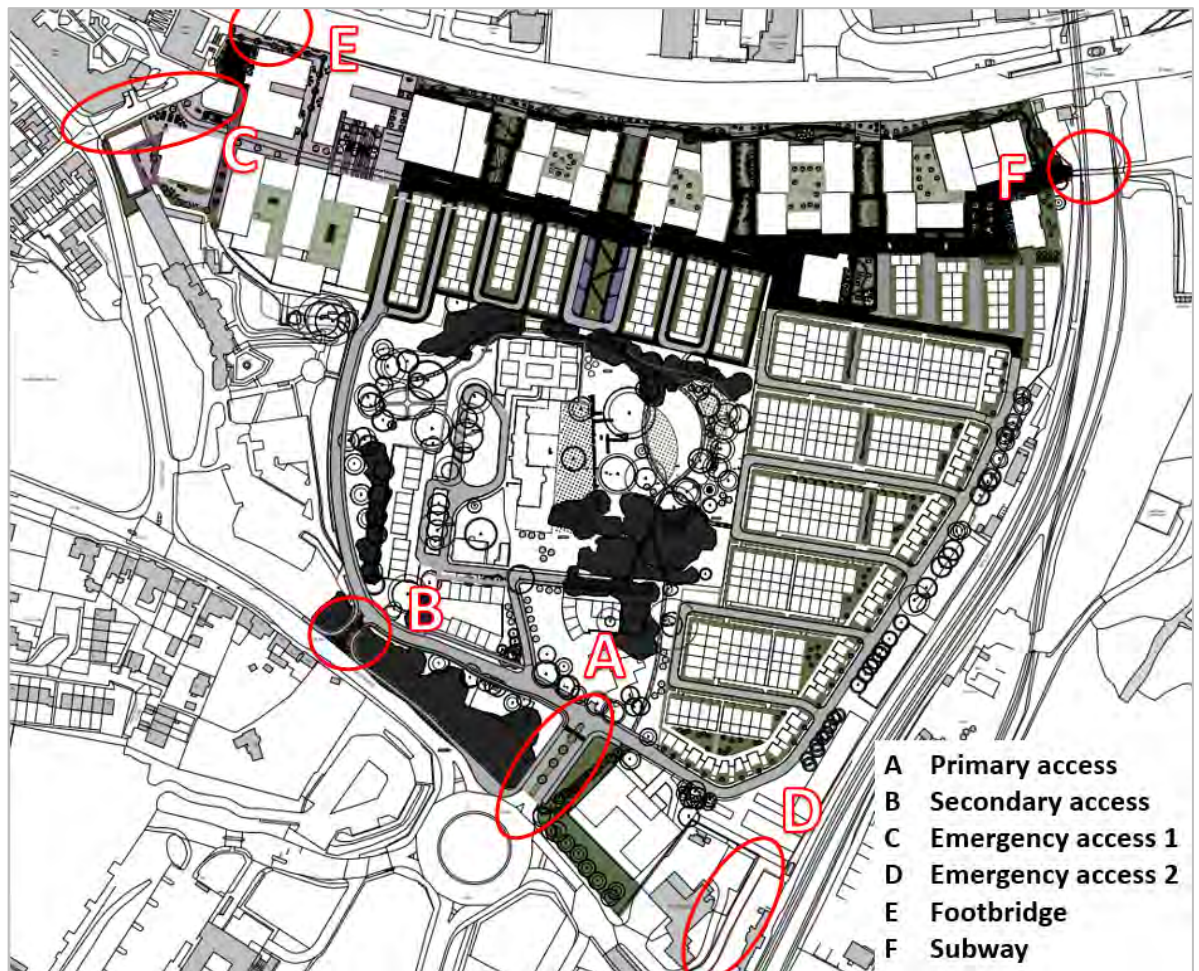
**Figure 4.11 – Secondary access from Bracondale**



- 4.4.16 This shows that a relatively modest secondary access could easily be accommodated onto Bracondale with no adverse effect on highway safety or operational capacity.
- 4.4.17 As the **south-eastern** extent of the site, the Carrow Works land has an existing emergency access onto Bracondale, to the east of the fire station. This gated access has served the site for many years but is now over-grown and unused. This access varies in width but is generally around 5.0m-5.5m wide. This is therefore adequate to accommodate two-way vehicular traffic, but not in conjunction with pedestrian access.
- 4.4.18 The limited width makes this unsuitable as a general secondary access but very suitable as a further pedestrian/cycle link which can be used by emergency vehicles.
- 4.4.19 The outcome of this option analysis is the conclusion that if the highway authority will not accept a parallel carriageway as the sole means of access, then a limited movements secondary access onto Bracondale would be the most suitable secondary access. These can work together to ensure access to all residents and businesses even if both carriageways of the main access were obstructed. Furthermore, the site will benefit from two further accesses for emergency vehicles of both the primary and secondary accesses were obstructed. This creates a highly permeable layout for pedestrians and cyclists on a daily basis and a very safe, highly accessible site for the emergency services.



**Figure 4.12 – Access strategy.**

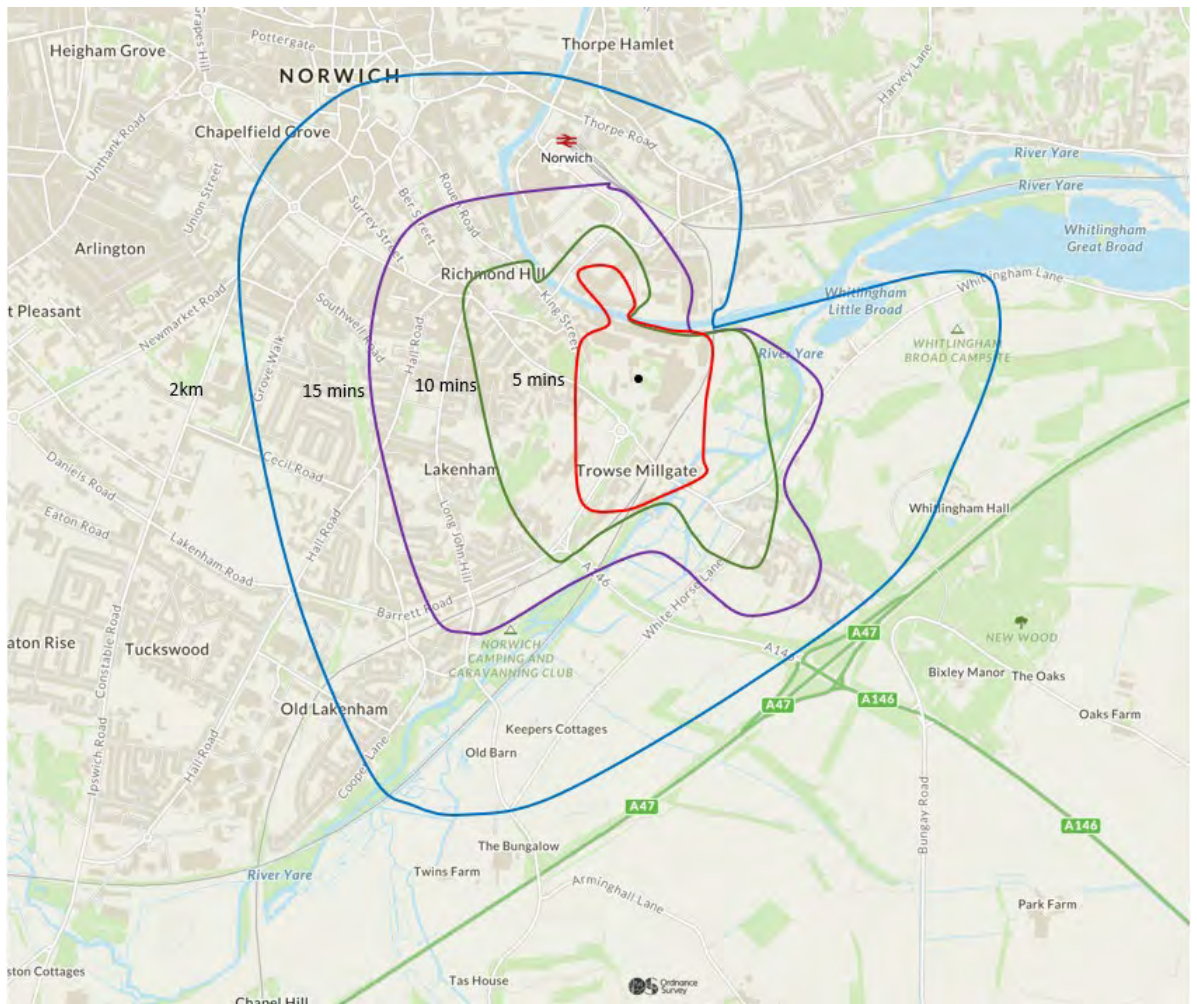


4.4.20 The provision of linkages to the north and east has a significant effect on the catchments within walking distance of the site; this is illustrated in the revised isochrones shown in Figure 4.11 below. The introduction of a footbridge across the River Wensum reduces the walking time to Norwich station so that it is within a 10-15 minute walk from the centre of the site. Equally, the opening up of the subway will place all of the new facilities to be delivered by this development within easy walking distance of the Deal Ground development. The subway will also open up access to the Whitlingham Broads and the River Yare to the east of the city.





**Figure 4.13 – Improved pedestrian isochrones**





### Healthy Streets approach

4.4.21 Within the development, the movement strategy reflects the hierarchy of road users set out in Section 4.2 above. This is achieved by applying the Healthy Streets approach, which is based on ten evidence-based indicators, each describing an aspect of the human experience of being on streets.

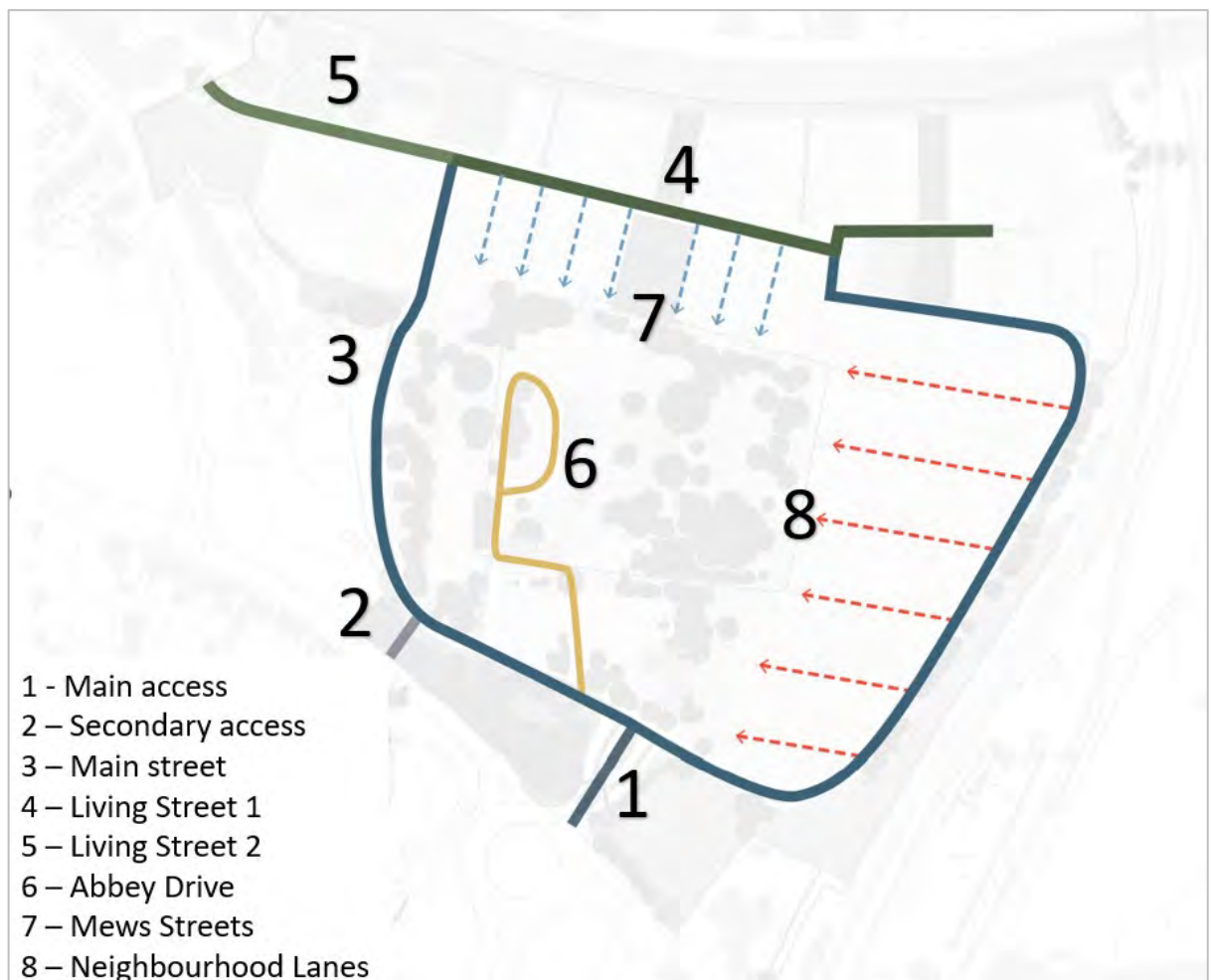
Figure 4.14- Healthy streets approach



4.4.22 These ten indicators must be prioritised and balanced to improve social, economic and environmental sustainability through the way in which the streets are designed and managed.

4.4.23 As described earlier, the development has distinct character areas. The streets within each of these character areas play an important role in defining that character. The principles of achieving Healthy Streets are applied to each of those different characters, but the outcomes for each character areas will necessarily differ.

**Figure 4.15 – Street characters**

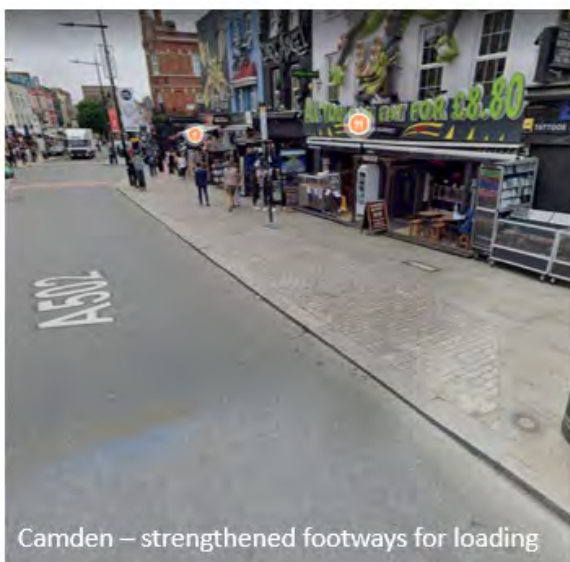


- 4.4.24 All internal streets will be subject to a 20mph speed limit and will benefit from a comprehensive system of street lighting. All pedestrian crossing points will have flush kerbs (maximum upstand 6mm) and tactile paving. Layouts will be designed to ensure natural surveillance of all routes where practicable. The landscape design is an integral part of the street design to ensure there are places to stop and rest as well as shade and shelter and interesting things to see and do throughout the development.
- 4.4.25 The main access has been described earlier; it will be a soft-landscaped gateway into Carrow Works with 3m wide shared cycleway/footways running along both sides. The short length with delineated pedestrian/cycle crossings at either end will ensure low vehicle speeds and a feeling of safety for all users.
- 4.4.26 The secondary access will be lightly trafficked and therefore suitable for cyclists. It will have 2m footways on both sides. The location of the access has been chosen to minimise any effect on existing trees and will therefore run between existing mature landscaping. Again, the short length with delineated pedestrian/cycle crossings at either end will ensure low vehicle speeds and a feeling of safety for all users.
- 4.4.27 The Main Street is the horse-shoe shaped perimeter road which uses the existing Carrow Works carriageway but ensures fully segregated 2m footways are provided on both sides along its full length. This route varies in width but has a minimum carriageway width of 6m so that it is suitable as a bus route. The movement strategy ensures there are alternative routes for cyclists, but the Main street is suitable for cyclists to use the carriageway.
- 4.4.28 The Living Street 1 which runs east-to west will be a balanced street. This is not a fully shared space



as it has low kerbs defining the central carriageway; however, the sensitive use of materials and landscaping provides pedestrians and cyclists with the feeling that this is public realm through which vehicles are allowed rather than a road with people pushed to the edges. A number of reference points have been examined in developing the balanced street approach for Carrow Works.

**Figure 4.16 – Balanced street reference points**



- 4.4.29 When appropriate materials are used in conjunction with a low kerb height (top left), the spaces for vehicles and pedestrians are less definitive, so the street feels far more in keeping with the Healthy Streets approach, but the presence of a defined kerb face means those with a visual impairment, or other diverse needs, can still negotiate the environment.
- 4.4.30 Contrasting materials with a flush surface (top right) also create a balanced street rather than a fully shared space. Many pedestrians feel comfortable using the full width of the street, but the tarmac 'carriageway' makes it clear which part of the route vehicles should use. This approach has its merits but is less able to meet the needs of a diverse population.



- 4.4.31 The perimeter road will provide a route for service vehicles; however, the use of strengthened footways (bottom left) rather than loading laybys means that rather than these areas being unused extensions of carriageway for most of the time, they are part of the pedestrian realm for most of the time and occasionally used by service vehicles when required.
- 4.4.32 Balanced streets will incorporate hard and soft landscaping from building to building to provide a space that is designed at the human scale, and which reflects the Healthy Streets approach.
- 4.4.33 Living Street 2 provides a link between Living Street 1 and Paper Mill Yard. This will be a true shared space, primarily used by pedestrians and cyclists but with limited access for service vehicles and infrequent access for emergency vehicles.
- 4.4.34 Abbey Drive has been developed following feedback from NCiC's conservation officer and reinstates the line of a historic route to the Abbey. This street forms part of the setting of the listed building and will therefore reflect the character of the Abbey. Whereas Abbey Drive is a functioning street, it forms an integral part of the Bowles & Wyer's details landscaping scheme for the Abbey and its grounds.
- 4.4.35 Street types 1 to 6 referred to above, all for part of the detailed planning application. Street types 7 and 8 fall within the outline part of the application; they are included in JTP's illustrative layout and described in the Design and Access Statement and Design Code; however, they do not form part of the means of access which is to be determined as part of this application.
- 4.4.36 Further details of the street design are set out in the Design Code.



## 5.0 RESIDENTS' TRAVEL INFORMATION

### 5.1 Introduction

5.1.1 As stated in the introduction, this TS has been developed to seek to influence modes of travel to the proposed redevelopment rather than merely predicting travel patterns and providing mitigation.

5.1.2 The development will be supported by a three-part Transport Implementation Strategy (TIS) comprising:

- Residents' Travel Information Pack;
- Delivery and Servicing Plan;
- Construction Logistics Plan.

5.1.3 These are described in the following chapters.

### 5.2 Residents' Travel Information Pack

5.2.1 Unlike employment, retail or educational sites it is not possible to dictate to residents how they should travel. For this reason, residential travel planning is based on the provision of infrastructure and information rather than the imposition of management procedures. In the case of this proposed residential development the introduction of appropriate infrastructure and the communication of relevant information are structured as a 'Resident's Travel Information Pack'.

5.2.2 The proposed development will provide appropriate infrastructure to encourage sustainable travel and will also provide information and incentives where practicable.

5.2.3 The effects of travel choices on our environment, our health and our quality of life are well documented. Sources describe how increases in road traffic have produced unsustainable levels of congestion and pollution. The effects can be felt at a local level through poor air quality, noise and busier roads and at a global level through suggested linkages to climate change. Journeys by road are becoming slower and more unreliable causing problems for business and stress to drivers. Even a small modal shift in home-work-home journeys away from the car would result in a considerable reduction in traffic congestion at peak times.

5.2.4 Travel planning must be realistic and should not expect to remove car usage altogether. Instead, an effective travel initiative will maximise the use of sustainable travel to achieve more sensible and appropriate use of the private car. If every car commuter used an alternative to the car on just one day a week, car usage levels for commuting would be reduced by as much as 20% immediately, with commuter parking requirements also reduced by up to 20%. In an accessible location such as East Norwich, however, low-car or car-free housing is a realistic prospect.

### 5.3 Infrastructure

5.3.1 A key element of the proposed development is the introduction of appropriate infrastructure to encourage sustainable travel.

5.3.2 The Site is already very accessible on foot, by bike and by bus and rail. The internal layout has been designed at a human scale using the Healthy Streets approach so that residents and visitors will choose to walk and cycle. New bus stops will be provided within the development to ensure every resident lives within 200m of a bus stop.

5.3.3 Beyond the site boundary, a series of infrastructure improvements will ensure there are no barriers to deter residents from walking or cycling into the City Centre.



## 5.4 Car Club

5.4.1 A number of Car Clubs already operate successfully throughout Norwich. The most common Car Clubs in this area are Co-wheels and Enterprise Car Club.



5.4.2 Whereas the existing Car Clubs would be available to the development's new residents, the developer will pursue the inclusion of a new Car Club within the site as part of the development. This would be available for the new residents but would also be available for the local community.

5.4.3 The initial provision would be on the basis of one car for every 200 households which equates to 9 Car Club spaces across the site. All Car Club spaces will be provided with electric vehicle charging points (EVCP).

5.4.4 The provision of the Car Club will be funded by the developer but delivered and operated by a professional Car Club operator. The initial proposal is expected to include.

- Free 3-year membership for new residents providing access to cars on site, the rest of Norfolk and the UK ;
- First car to be delivered by first occupation;
- Bespoke marketing material and membership certificates;
- Briefing of sales staff at the development on the Car Club and attendance at promotional events;
- 24/7 customer service team;
- 24/7 booking system including mobile booking site (IOS and Android) and iPhone app;
- Vehicle insurance;
- Vehicle maintenance;
- Creation of reports and statistics for the developer and Council;

5.4.5 This would be fully funded by the developer at no expense to the new occupiers. Importantly, the Car Club would also be available to local residents in the area. The provision of the Car Club can be secured by appropriate planning condition.

5.4.6 In accessible areas, Car Clubs allow residents who only require occasional use of a vehicle to make the choice not to own a vehicle themselves. Equally, many two-car households only use 1.1 cars on a regular basis, so the provision of a Car Club allows them to own a single vehicle and use the Car Club as often as they like on a pay-as-you-go basis. The charitable organisation CoMoUK states that one Car Club space can remove 20 vehicles from the road.

## 5.5 Residents' Travel Pack

5.5.1 It will be the responsibility of the developer to ensure that residents are provided with an information pack containing details of the Car Club, public transport timetables and maps, as well cycling and pedestrian infrastructure when they move into the houses and flats.



- 5.5.2 The site's communal areas will be maintained by a management company. The management company will be obliged to provide an update to the 'Residents Travel Pack' once every twelve months in order that any new residents are made aware of their local transport options.
- 5.5.3 The information pack will include information and incentives for all residents. The information will enable the new residents to make informed decisions about their modes of travel. The incentives will be provided by the developer in the first instance and will be dependent on negotiating suitable packages with local shops and services. The likely content of the Residents' Travel Pack will be:
- Car Club membership and information;
  - Cycle route information;
  - Sustrans leaflets on the beneficial effects of walking and cycling ;
  - Free or discounted reflective clothing i.e. cycle bib, arm bands etc.;
  - Free or discounted bicycle locks/helmets;
  - Developer to negotiate local cycle shop discount (e.g. Bicycle Lings, King Street) ;
  - Details of local cycle groups (e.g. CTC Norwich);
  - Details of BikeBUDi travel system ;
  - Cycle hire;
  - Bus route/timetable information;
  - Details of car-sharing website (e.g. [www.norfolk.Liftshare.com](http://www.norfolk.Liftshare.com));
  - Details of CarBUDi travel system;
  - Notice/message board in foyer of flats to allow people to car share/walk/cycle together (perhaps at night for safety);
  - Developer to negotiate preferential rates at local car-hire company;
  - Taxi company information – possible discount vouchers for a taxi company;
  - Details of TaxiBUDi travel system;
  - Supermarket home delivery details.
- 5.5.4 This list is not exhaustive or a prescriptive list of what will be in the travel pack but provides details of the likely content of the pack. Details of the final pack will be agreed in partnership with the Council.
- 5.5.5 Due to the hybrid nature of the planning application (part outline, part full) a Framework Travel Plan (FTP) will be prepared for the non-residential uses. The FTP will be secured by appropriate planning condition such that individual Operator Travel Plans (OTP) can be prepared under the aegis of the FTP and agreed in partnership with NCoC and NCiC within six months of each commercial unit being occupied.





## 6.0 DELIVERY AND SERVICING PLAN

### 6.1 Introduction

- 6.1.1 This Delivery and Servicing Plan (DSP) highlights the implications of the proposed redevelopment with regard to existing and also proposed servicing constraints. This report takes into consideration the adopted methods of good design practice. This DSP has been prepared in accordance with the Freight Transport Association document '*Designing for Deliveries*' and the guidance document '*Managing freight effectively: Delivery and Servicing Plans*.'
- 6.1.2 A DSP will aim to provide consideration of consolidation and collaborative delivery arrangements to help reduce the impact of commercial goods and servicing vehicle activity in and out of premises/developments.
- 6.1.3 A series of swept path analyses are included as **Appendix K**.

### 6.2 Refuse collection

- 6.2.1 NCiC currently operates residential kerbside collection in the Lakenham area. All houses within the development will have wheelie bins collected in the same manner as the existing local refuse routes. For flats within the development, refuse stores will be provided at ground floor level with double-doors opening directly onto hard paved private frontage. Residents will be able to bring refuse down to ground level where they will have easy access into the refuse stores. The refuse stores will have doors no further than 10m from the public highway. Refuse and recycling bins can be collected directly from the stores and wheeled to the vehicles.
- 6.2.2 All domestic refuse will be collected by NCiC; however, all commercial refuse will be collected under private contract.

### 6.3 Consolidation

- 6.3.1 Residents and business operators will be advised of the importance of consolidating deliveries where possible. New residents will be provided with information explaining how they can consolidate deliveries such as supermarket deliveries with their neighbours and how this can deliver cost savings. This accords with NCiC advice.

### 6.4 Hours of delivery

- 6.4.1 There are no restrictions on the hours of delivery to other residential or business premises served by Bracondale. There is therefore no need to restrict delivery hours.

### 6.5 Route management

- 6.5.1 The site takes access from the Bracondale. There are no height or weight restrictions on Bracondale (in the vicinity of the site), King Street or Martineau Lane; however, to the north of the King Street junction, Bracondale is subject to a 7.5t weight limit. This route is therefore unsuitable for HGVs with a gross laden weight greater than 7.5t. Most residential daily deliveries (parcels and groceries) are made by smaller vehicles whereas most commercial deliveries will be in vehicles larger than this.
- 6.5.2 As a principle, all drivers will be advised to use the highest category of road legally available to them and to avoid residential roads where practicable.

### 6.6 First time delivery

- 6.6.1 Provision will be made for first time deliveries. This will ensure that there is a safe and secure location to drop parcels off if residents are unavailable to take receipt of goods at time of delivery. This will reduce the need for return visits.



## **6.7 Promotion of LGV rather than HGV**

6.7.1 Residents will be advised of the benefits of promoting delivery by Light Goods Vehicles. New residents will be provided with a leaflet explaining what information should be provided to delivery companies to maximise the use of small vehicles for deliveries or to advise of appropriate servicing arrangements for larger vehicles. This accords with NCoC advice.

## **6.8 Ongoing control and regulation**

6.8.1 A refined version of this DSP will be prepared in partnership with NCoC and NCiC prior to the proposed development being occupied; however, the structure, obligations and principles are included here for agreement prior to determination.

## 7.0 TRIP GENERATION

### 7.1 Introduction

- 7.1.1 Guidance published in 2007 by the DfT and the then DCLG (now DLUHC) provided advice on the content and preparation of Transport Assessments and Transport Statements. In 2014 the DCLG published a suite of Planning Practice Guidance including advice entitled “*Travel plans, transport assessments and statements*”. The 2007 guidance has been superseded by the PPG as current government guidance on the transport related effects of development, but many highway authorities still refer to it as useful advice on detailed matters of transport development. In preparing this note, due consideration has been given to national guidance as well as the Norfolk County Council publication ‘*Safe, Sustainable Development: Aims and Guidance notes for Local Highway Authority requirements in Development Management*’ (2019).
- 7.1.2 The impact of the proposed development is determined by comparing the net increase in journeys between the existing and proposed uses. Accordingly, the DfT Guidance on Transport Assessment (March 2007) advises at paragraph 4.7 that baseline traffic data should be derived as follows:

#### **Baseline transport data**

- *The quantification of person trips generated from the existing site and their modal distribution, or, where the site is vacant or partially vacant, the person trips which might realistically be generated by any extant planning permission or permitted uses;”*
- 7.1.3 Accordingly, the transport effects of the proposed development should be determined by comparing the predicted travel demand associated with the proposed development with the potential travel demand generated by the permitted use of the site. The aerial image in Figure 7.1 below shows the wide range of buildings, external storage, HGV yards and car parking across the site.

**Figure 7.1 – Aerial image of site**

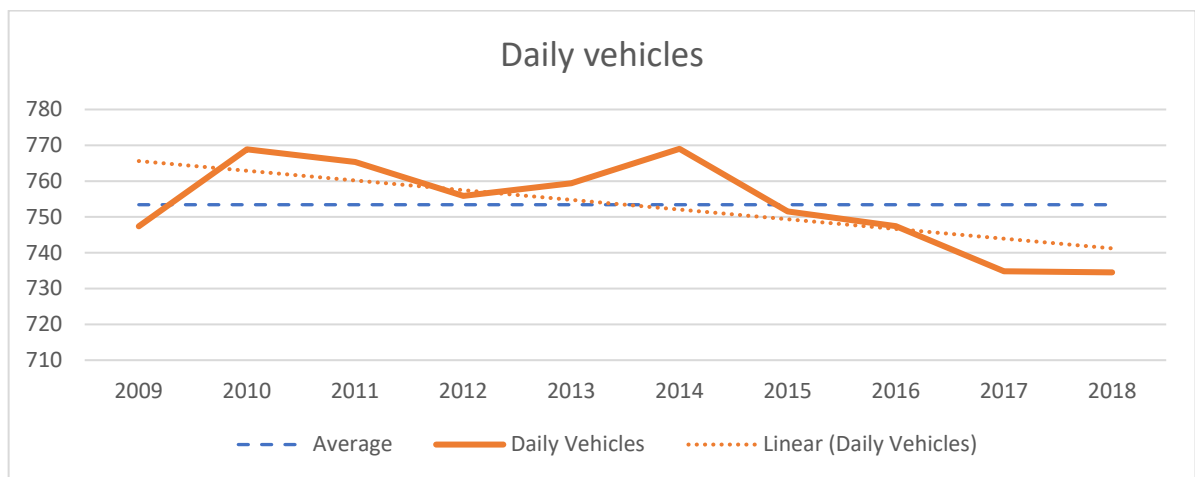




## 7.2 Existing

- 7.2.1 Daily traffic flows have been obtained from gate data, from 2010 to 2020. This data is split down into months of the year and is categorised into different visitor types. The gate data represents visitors (including all commercial deliveries and collections), but staff members had swipe cards and were recorded separately. Only partial data is available for 2019 and 2020 so the 2018 figures are considered to be the most recent representative flows.
- 7.2.2 Figure 7.2 below shows the decline in the average number of vehicles entering the site per day between 2009 and 2018 and in particular between 2014 and 2018.

**Figure 7.2 – Factory traffic, average daily vehicles**



- 7.2.3 It is important to note that Figure 7.2 illustrates the number of *vehicles* entering the site each day. Those same vehicles would also leave the site, so the number of *vehicle trips* is twice the number of vehicles.
- 7.2.4 This dataset shows that in 2018 some 735 vehicles entered the site on an average day, equating to 1470 vehicle trips per day. This is a little below the average 1506 vehicle trips per day across the ten-year period for which data has been reviewed.
- 7.2.5 In addition to baseline data for the site, a number of traffic surveys have been undertaken on the surrounding highway network. At the time of writing, a set of automatic traffic counters (ATCs) have been installed to record 14 days of classified direction vehicle flows, including vehicle speeds in seven locations surrounding the site. These are supported by manual peak hour turning counts (MTC) at three junctions.
- 7.2.6 The survey locations are shown below and at **Appendix D**. Full data in Excel format have been provided separately to the local highway authority.
- 7.2.7 No direct observed information is available to assess the average daily profile and peak hour vehicle movements; however, the TRICS database holds survey information for a variety of industrial uses. The proposed development re-provides an amount of industrial, and distribution uses as part of the mixed-use development, so it is necessary to interrogate the TRICS database to derive predicted peak hour and daily vehicle trips for those uses. It is therefore reasonable to use that dataset to derive an assumed daily profile for the former use of the site and apply that profile to the observed daily vehicle trips.
- 7.2.8 The TRICS data for the industrial uses relates to eight sites in England only, outside London and in locations with a similar level of accessibility to the proposed development site. The TRICS data is included in **Appendix L**.
- 7.2.9 The data for Industrial uses indicates that 9% of vehicle trips occur during the morning peak hour (0800-0900) and 6% during the evening peak hour (1700-1800). When these proportions are applied to the observed daily flows for the former use of the Carrow Works site, the peak hour and daily vehicle flows are as shown below.

**Table 7.1 – Carrow Works previous industrial vehicle trips**

	Arrive	Depart	Total
0800-0900	80	59	139
1700-1800	40	54	94
Daily	703	703	1506

### 7.3 Proposed

7.3.1 The TRICS database has been interrogated in order to derive predicted vehicle trips for the proposed site uses. In each case, the surveys selected were all in England, outside London, in areas with similar levels of accessibility and, where practicable, for sites of a similar size (+/- 50%).

7.3.2 Adjustments have been made where the proposed parking levels differ from the survey sites, and adjustments have been made to take account of internal and linked trips. This is explained further below.

#### Residential use

7.3.3 The TRICS database includes surveys of social rented and affordable housing. These generally show slightly lower trip rates than houses and flats in private ownership. For a robust assessment, only trip rates for private dwellings have been used. This is likely to slightly over-estimate the predicted travel demand.

7.3.4 The multi modal trip rates are shown in table 7.2 below.

**Table 7.2 – Flats in private ownership (1463 dwellings)**

	Trip rates			Vehicle trips		
	Arr	Dep	Total	Arr	Dep	Total
0800-0900	0.049	0.138	0.187	72	202	274
1700-1800	0.132	0.069	0.201	193	101	294
Daily	0.834	0.887	1.721	1220	1298	2518

7.3.5 The TRICS data for flats is based on five survey sites, all of which are in comparable locations; however, the average parking provision across all five survey sites is 1.06 spaces per dwelling. The proposed parking provision for the flats at Carrow Works will be in the order of 0.20 spaces per dwelling. The data would suggest that the Carrow Works flats will generate around 19% of the trips shown in Table 7.2; however, for a robust assessment vehicle trips will be based on 30% of the figures in Table 7.2. This is shown below.

**Table 7.3 – Flats in private ownership (adjusted)**

	Trip rates			Vehicle trips		
	Arr	Dep	Total	Arr	Dep	Total
0800-0900	-	-	-	22	61	82
1700-1800	-	-	-	58	30	88
Daily	-	-	-	366	389	755

7.3.6 The same process has been followed for the proposed houses, once again using Houses in Private Ownership for a robust assessment.

**Table 7.4 – Houses in private ownership**

	Trip rates			Vehicle trips		
	Arr	Dep	Total	Arr	Dep	Total
0800-0900	0.137	0.393	0.53	54	154	208
1700-1800	0.359	0.159	0.518	141	62	203
Daily	2.254	2.278	4.532	884	893	1777

- 7.3.7 As for the flats, the TRICS data for houses is based on 16 comparable sites; however, the average parking provision across those sites is 2.43 spaces per dwelling. The proposed parking provision for the houses at Carrow Works will be in the order of one space per dwelling. The data would suggest that the Carrow Works houses will generate around 41% of the trips shown in Table 7.4; however, for a robust assessment vehicle trips will be based on 60% of the figures in Table 7.4. This is shown below.

**Table 7.5 – Houses in private ownership (adjusted)**

	Trip rates			Vehicle trips		
	Arr	Dep	Total	Arr	Dep	Total
0800-0900	-	-	-	32	92	125
1700-1800	-	-	-	84	37	122
Daily	-	-	-	530	536	1066

- 7.3.8 The total residential vehicle trips are therefore derived by adding Table 7.3 and table 7.5.

**Table 7.6 – Combined residential vehicle trips**

	Trip rates			Vehicle trips		
	Arr	Dep	Total	Arr	Dep	Total
0800-0900	-	-	-	54	153	207
1700-1800	-	-	-	142	68	210
Daily	-	-	-	896	925	1821

#### Non-residential uses

- 7.3.9 The proposed development includes a range of commercial and industrial uses. The industrial uses fall within Use Classes B2 (general industry) and B8 (storage and distribution). For the purpose for this assessment, the industrial uses are assumed to comprise and equal mix of B2 and B8 uses.
- 7.3.10 The commercial uses will fall within Use Class E which includes a wide range of uses including retail, office, gyms, cafes. It is common when agreeing the scope of a TA for Use Class E to consider the 'worst case;' however, the worst-case mix of uses will change depending on whether we are considering daily traffic, peak hour traffic, number of HGVs, parking demand, linked trips, percentage of pass-by traffic etc. It may also be that the worst case in terms of, say, total daily traffic may be generated by 100% retail use. In practice, it would not be commercially viable for all the commercial units to be retail, nor would it be acceptable in terms of urban design. Given the above, it is more appropriate to assess a 'likely' mix of uses, but to acknowledge any increases or changes that would derive from an alternative mix.
- 7.3.11 For the purpose of this assessment, the likely mix of commercial uses is as set out below.



**Table 7.7 – Non-residential uses (likely mix)**

Area	Building	Type	GFA (m <sup>2</sup> )	Use	
1	Gateway	92	Existing	1003	Wine bar, <i>local retail</i> , offices
1	Gateway	207	Existing	1314	Foodhall
1	Gateway	206/5	Existing	2444	<i>Café</i> , offices
1	Gateway	7/7A/8/8A	Existing	2478	B&GF Leisure, FF offices
1	Gateway	209	Existing	7230	GF retail/studios, upper x4 offices
1	Gateway	1B	New	850	Foodhall
2	Waterside	2A	<i>New</i>	<i>1239</i>	<i>Local retail</i>
2	Waterside	2B	<i>New</i>	<i>1239</i>	<i>Local retail</i>
2	Waterside	2C	<i>New</i>	<i>1239</i>	<i>Local retail</i>
3	Railway side	3A	<i>New</i>	<i>234</i>	<i>Local retail</i>
3	Railway side	3B	New	0	
10	Foodstore	10A	New	2030	Food retail
10	Industrial	10B	Existing	1182	B2/B8
10	Industrial	10C	New	911	B2/B8
10	Industrial	10D	New	911	B2/B8
11	Mustard seed driers	35	Existing	1974	Food and beverage

- 7.3.12 The uses shown in italics would comprise of facilities designed to serve the Carrow Works development rather than be destination uses. These would be facilities such as convenience stores, sandwich shops, hairdressers etc. Journeys associated with these uses would be **internal** to Carrow Works and not new trips on the highway network. Indeed, they would remove the need for the new residents to travel externally for such services.
- 7.3.13 The other uses, not shown in italics would be destinations; however, it is reasonable to assume that a proportion of the customers using those facilities would be from the Carrow Works site or even Deal Ground residents who could walk or cycle to these new facilities. Workers in the new offices would be likely to use the retail uses and cafes within the site, as would the new residents. These would be **internal** trips and not new trips on the highway network.
- 7.3.14 Given the mix of uses, a proportion of the customers attracted to the site from external locations would be likely to make **linked** trips (i.e. visit more than one facility). A retail customer who then went for a coffee would only represent one arrival and one departure to and from the local highway.
- 7.3.15 Finally, for some of the uses such as the proposed foodstore in site 10, a proportion of the customers would already be using the A147 and would visit the store as part of an existing journey, particularly during the highway peak periods. These are referred to as **pass-by** trips; they would be new into and out of the site but would not be new trips on the local highway network.
- 7.3.16 The new trips into and out of the site that are not internal, linked or pass-by trips are referred to as **primary** trips. These represent new trips on the highway network.
- 7.3.17 The final trip type is **diverted** trips. For example, people will not buy more food just because a new food store is built, they will just buy it in a different location. The trips associated with the new foodstore will not be new, just diverted. Any trips diverted into to the study area will be treated as Primary trips



as part of the assessment; however, it should be noted that any diverted trips treated as primary within the study area will have been removed from another part of Norwich.

7.3.18 Table 7.8 below shows the trip type assumptions for each of the likely uses on the Carrow site:

**Table 7.8 – Trip type assumptions**

Use	Internal	Linked	Pass-by	Primary
B2 General industry	-	-	-	100%
B8 Storage & distribution	-	-	-	100%
Foodstore	20%	-	30%*	50%
Foodhall	50%	-	15%	35%
Offices	10%	-	-	90%
Gym/leisure	30%	20%	-	50%
Local / convenience	90%	10%	-	-
Residential	-	-	-	100%

7.3.19 Table 7.8 assumes that all trips associated with the residential and industrial uses will be primary trips and new to the highway network. This is a robust assumption as it does not deduct the internal trips for those uses.

7.3.20 The office uses are deemed to generate 90% primary trips. This is also a robust assumption as it assumes only 10% of employees working in the new office space will live in Carrow Works or Deal Ground.

7.3.21 The pass-by percentage for the foodstore is derived from TRICS research paper 1/95.

7.3.22 The internal and linked trips for all uses are considered to be reasonable assumptions, erring on the conservative side in order to ensure a robust form of assessment.

7.3.23 No deductions have been made for diverted trips. All external trips within the study area will be treated as primary trips. It should be acknowledged that all diverted trips will be removed from other parts of the highway network in Norwich.

7.3.24 The trip generation calculations based on Tables 7.7 and 7.8 are set out in **Appendix M**. The resultant primary trips on the highway network equate to:

**Table 7.9 – External vehicle trips**

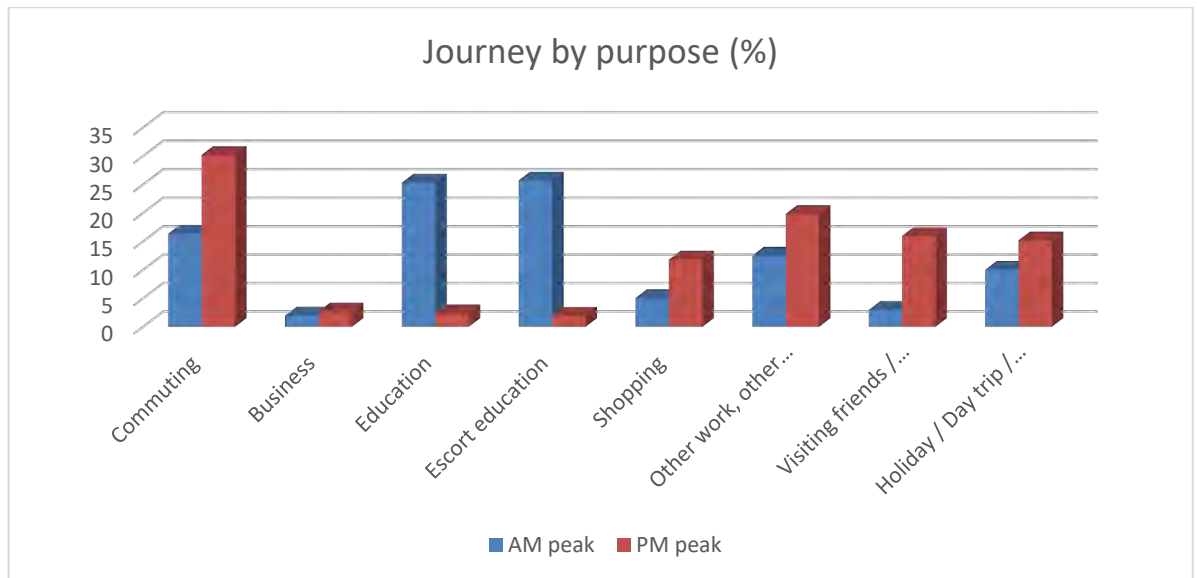
	Existing	Proposed	Net change
AM	135	396	261
PM	90	490	400
Daily	1503	4767	3264

#### Trip distribution

7.3.25 During scoping discussions NCoC requested that peak hour vehicle trip distribution should be based on journeys to work derived from Census data. Needless to say, not all vehicle trips during the highway peak hours are journeys to work. For this reason, the first assessment of Census data should always be to establish the proportion of trips that are journeys to work. The Census data does not hold information on journey purpose for Norwich specifically but it does for the East of England and for Norfolk. The Norfolk data is shown in the graphs below.



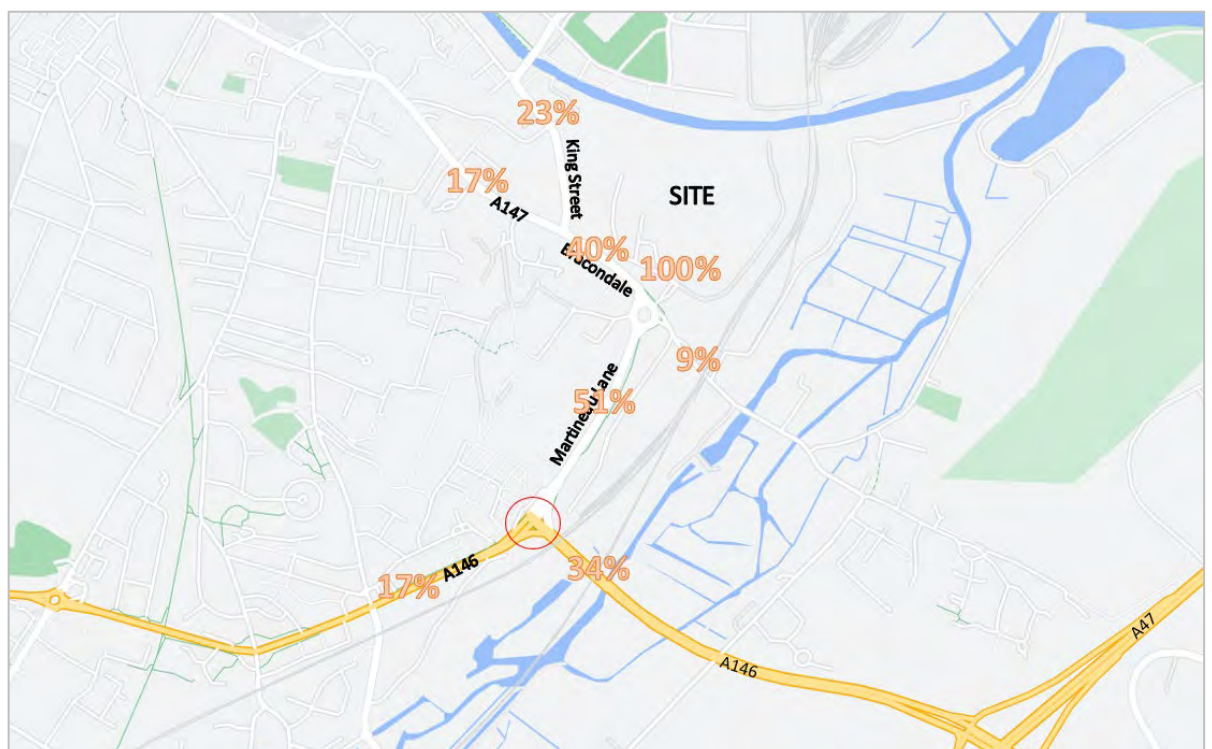
**Figure 7.3 – Peak hour journey by purpose**



7.3.26 This illustrates that during the morning peak (0800-0900) commuting only represents 16% of all journeys on the highway network with education being by far the primary purpose. During the evening peak (1700-1800) commuting is the dominant purpose; however, it still only represents 30% of all journey types.

7.3.27 Based on this information it would be inappropriate to distribute all peak hour vehicle trips onto the highway network in accordance with journey to work destination proportions. Alternatively, the observed baseline data on the local highway network includes all journeys for all purposes. In this instance it is therefore more accurate to apply a weighted distribution in proportion to the observed flows on each road link within the study area. For clarity, the proportions, radiating outwards from the site are as shown below.

**Figure 7.4 – Weighted distribution**





7.3.28 Based on the proportional distribution shown in Figure 7.4, a series of peak hour link flow diagrams and origin/destination tables have been prepared for the following scenarios:

- 2022 observed baseline
- 2028 baseline (TEMPro growth to year of completion)
- 2028 plus Colman's traffic
- 2028 plus Development

7.3.29 The diagrams and tables are included as **Appendix N**.

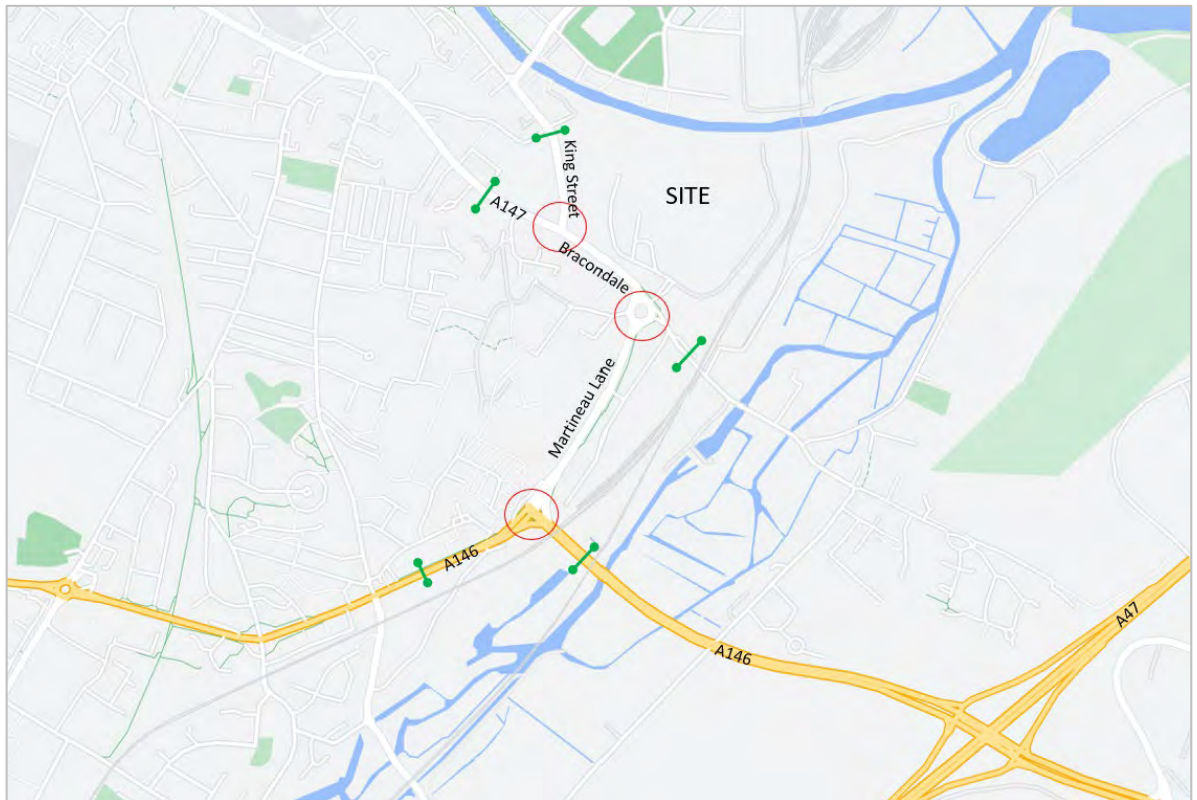
7.3.30 The net change in vehicle trips has been used to assess the transport effects on the local highway network.

## 8.0 TRANSPORT EFFECTS

### 8.1 Net effects

8.1.1 The junctions within the study area have been assessed using the proprietary software ARCADY and LinSig. The methodology and findings are set out in detail in Technical Note 3.

**Figure 8.1 – Study area**



8.1.2 All junctions have been assessed for 2022 (validation), and 2028 (future year) for the following scenarios:

1. Do nothing - Observed baseline plus TEMPro growth (including committed development)
2. Do minimal – As 1 but with Colman's traffic added
3. Do something – As 1 but with development traffic added

8.1.3 Any proportional increase beyond the study area (green cordons in Figure 8.1) have been assessed against the criteria set out in Norfolk CC guidance; however, during scoping discussions NCoC advised that this guidance is not considered to be up to date. Accordingly, a uniform lower threshold of 3% has been set across the network.

8.1.4 The scoping note stated that the transport effects of development would be assessed by comparing the results of scenarios 2 and 3 and that mitigation requirements would be based on the following principles.



**Table 8.1 – Mitigation requirements**

2 – Colman's traffic	3 – Development traffic	Net change
Junction within capacity	Junction remains within capacity	No mitigation required
Junction within capacity	Junction over capacity	Mitigation required to bring junction within capacity, but necessarily to scenario 2 levels
Junction over capacity	Junction further over capacity	Mitigation required to bring junction back to scenario 2 levels

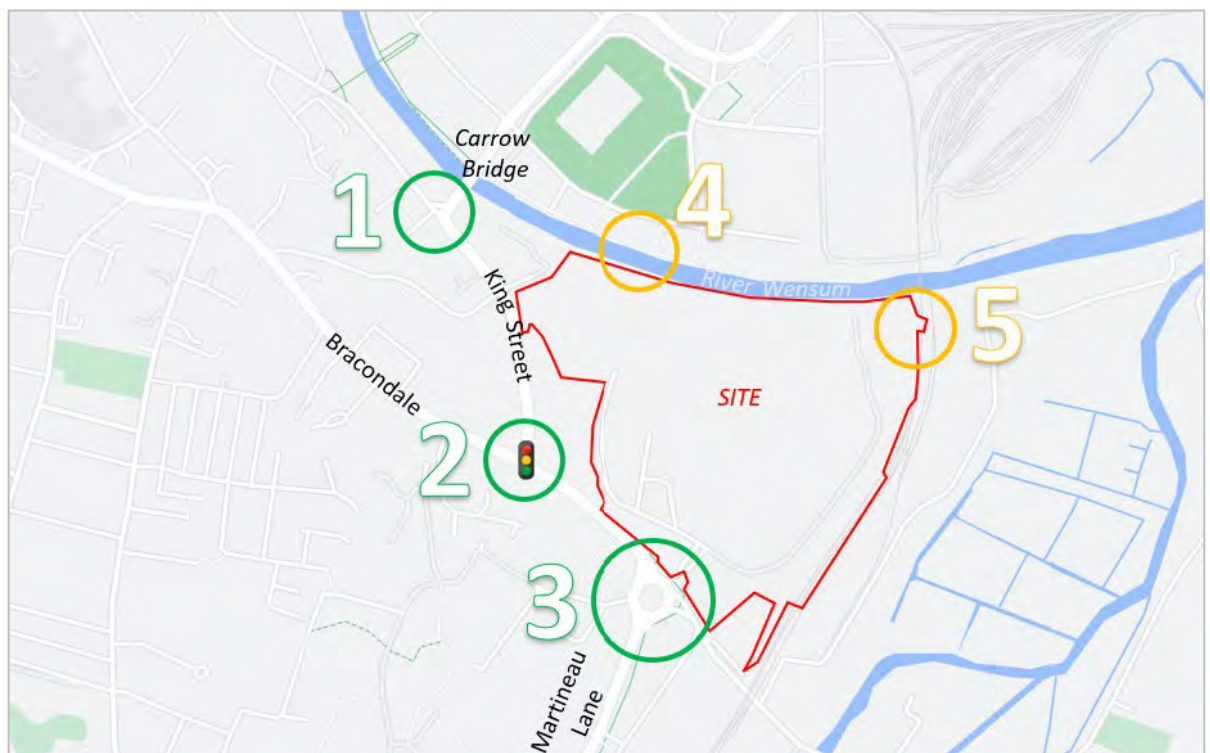
- 8.1.5 However, during scoping discussions NCoC stated that adopted policy requires greater focus on promoting sustainable travel choices rather than carrying out highway capacity improvements on a 'predict and provide' basis. For this reason, mitigation may be in the form of additional measures or infrastructure to promote walking, cycling and public transport use rather than additional junction capacity.
- 8.1.6 TN3 shows that all three junctions within the study area experience a level of stress during the AM and PM peak periods in 2028 (scenario 2). The introduction of additional traffic would increase queue lengths at all three junctions. The proposed development includes proposed off-site highway works at the County Hall Roundabout and at the King Street / Carrow Road junction (outside the original study area). The redevelopment of the Carrow Works site also provides an opportunity for pedestrians and cyclists to bypass the Bracondale/King Street junction.
- 8.1.7 The development will deliver a new footbridge over the River Wensum, reducing walking distances to key facilities, including Norwich station. It will also open up the subway beneath the rail line to extend walking routes to the east and increase walking and cycling opportunities for the Deal Ground development.
- 8.1.8 The development would also introduce two bus services into the heart of the scheme ensuring that every resident would live within 200m of a bus stop.
- 8.1.9 The Travel Plan measures, including a new Car Club within the scheme and free Car Club membership for all eligible residents will further promote sustainable travel choices and reduce reliance on the private car.
- 8.1.10 On the basis of the above, adequate mitigation is delivered by the significant sustainable transport infrastructure improvements that will be delivered by the proposed development rather than seeking to increase operational capacity within the local highway network.
- 8.1.11 TN3 shows that the net change between scenario 2 and scenario 3 would not exceed 3% proportional increase on any part of the highway network beyond the study area. It should be noted that in terms of the A146 link road, this proportional increase is measured against the observed 2019 AADF rather than the suppressed 2022 data.

## 9.0 TRANSPORT IMPROVEMENTS

### 9.1 Introduction

- 9.1.1 As described earlier, the proposed development has been designed to promote sustainable travel choices and to reduce reliance on the private car. Within the site, the movement strategy is based on a hierarchy which promotes walking and cycling, then shared and public transport and lastly makes provision for the residual private car trips.
- 9.1.2 This strategy extends beyond the site boundaries and seeks to provide a high quality and permeable network so that people will choose to walk and cycle.
- 9.1.3 This Transport Assessment has examined three locations on the primary route into the city centre (1, 2 and 3), and the East Norwich Masterplan identifies two locations for linkages beyond the site extents (4 and 5). These are described below.

**Figure 9.1 – Linkages and improvements**



### 9.2 Routes

- 9.2.1 The three primary desire lines for pedestrians and cyclists are to the north, over the River Wansum, to the east into the Deal Ground future development and to the North-west towards the City Centre. There will be an element of movement to and from the south, but this will be a relatively minor movement.

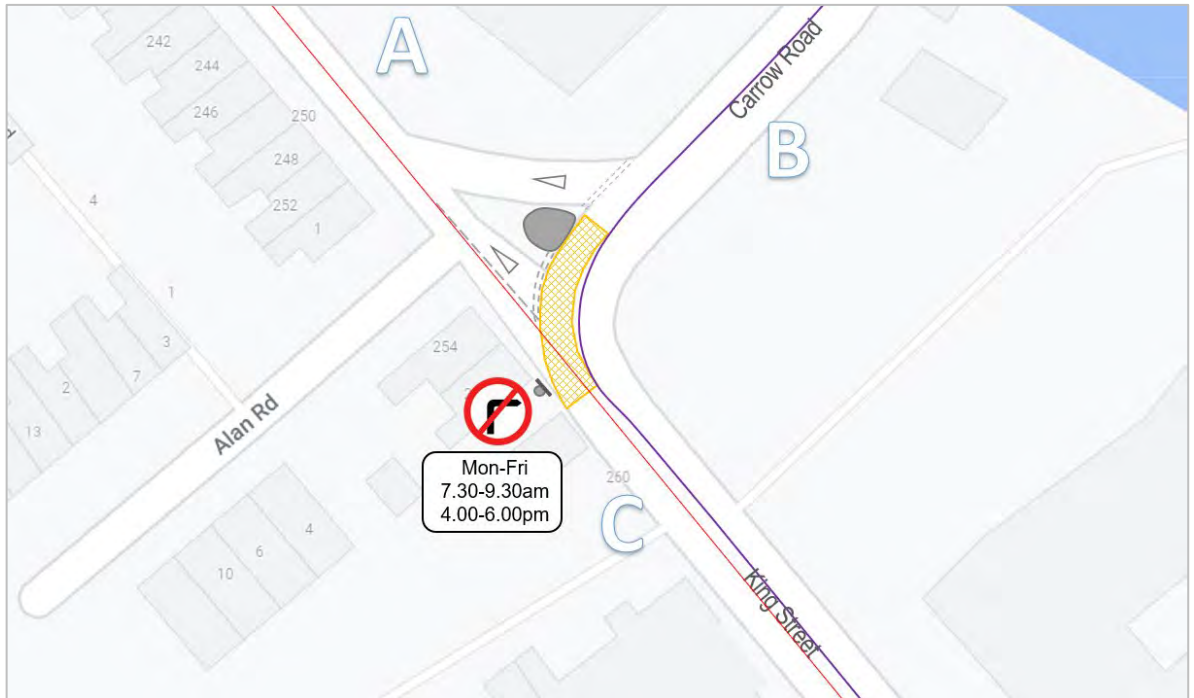
### 9.3 Linkages

- 9.3.1 The new bridge will open up a new route, north over the River Wansum. The footbridge will be in the location of the original Carrow Bridge which was built in 1810 and remained open until the new bridge was opened to the west in 1923. The new footbridge will reduce the walking time to Norwich Station and provide direct access between the site and Riverside Retail Park.
- 9.3.2 The subway will provide a link to the east, into Deal Ground but also opening up a leisure route linking to Whitlingham Country Park and Broads.

## 9.4 Nodes

- 9.4.1 The existing junction of King Street and Carrow Road is a simple priority junction; however, priority runs from B to C (see below) rather than A to C. King Street forms part of NCN1 as denoted in red, but no specific provision is made for cyclists.

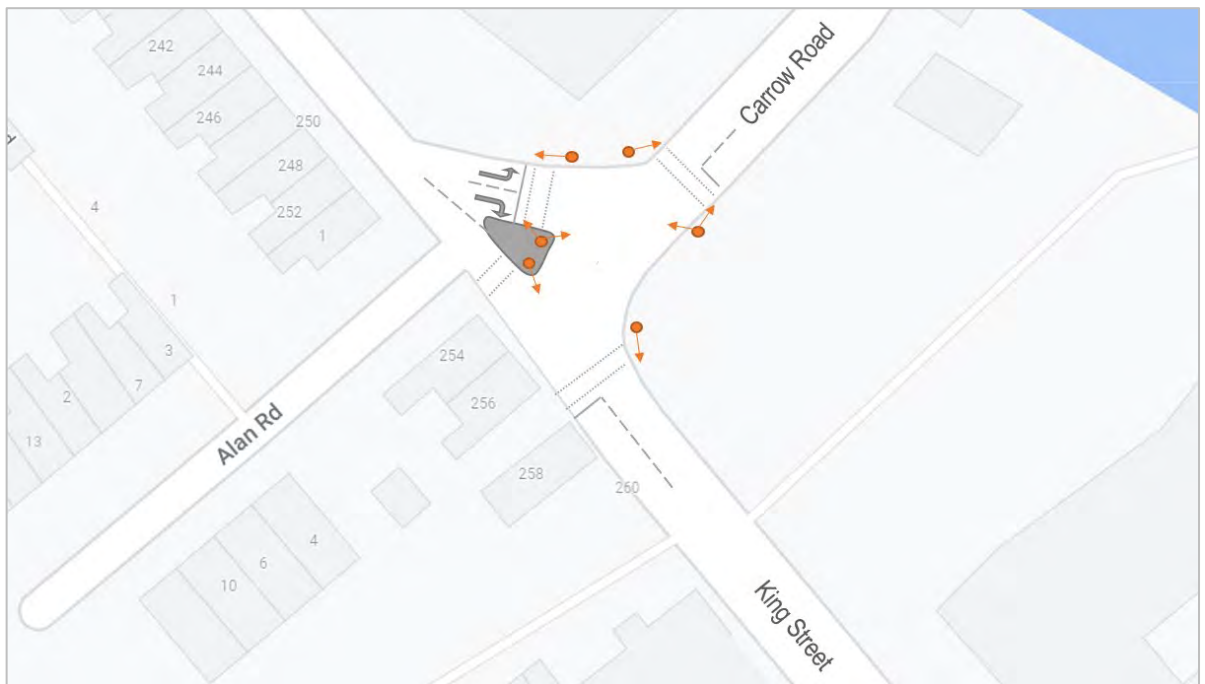
**Figure 9.2 – Existing King Street / Carrow Road junction arrangement**



- 9.4.2 The junction has box junction markings in order to keep it clear when traffic is queuing and the right turn from B to is A banned during the peak hours.
- 9.4.3 On site observations, and discussions with NCoC indicate that the movement from A to C can be difficult for cyclists.
- 9.4.4 A simple solution to make the movement through the junction more convenient for cyclists is to introduce a signal-controlled junction arrangement. This would allow cyclists to travel A to B or A t C under a green signal.
- 9.4.5 An illustrative sketch is shown below.



**Figure 9.3 – Proposed signal-controlled junction (sketch)**



- 9.4.6 A detailed design of the signals will be subject to a Stage 1 Road Safety Audit and submitted as part of the planning application.
- 9.4.7 An assessment of Site 2 (Bracondale j/w King Street) suggests that there are limited opportunities to improve the layout for cyclists due to the limited available widths within the public highway. NCoC have provided details of an earlier feasibility assessment which required third-party land (Carrow House). That scheme included improved crossing points for pedestrians but no facilities for cyclists such as advance stop lines. If NCoC as highway authority has legal rights over the land necessary to deliver their feasibility scheme, then an improvement could be secured in this location by means of a S106 obligation is required. Importantly, however, the redevelopment of the Carrow Works site provides an opportunity for cyclists to bypass this junction and travel through the site between County Hall Roundabout and King Street. This not only avoids the very busy signal-controlled junction, but also provides a preferable gradient, avoiding much of the hill up Bracondale and back down King Street.
- 9.4.8 Three options have been considered to improve facilities for cyclists at Site 3, County Hall Roundabout. The first is a full Dutch roundabout, similar to those introduced recently in Cambridge. This would reduce the circulatory carriageway width and introduce a perimeter cycle route around the full circumference of the roundabout. Pedestrian crossings would then be placed adjacent to the perimeter cycle route. This arrangement is illustrated below.

**Figure 9.4 - County Hall roundabout (Option 1 discounted)**



- 9.4.9 No formal junction capacity analyses have been undertaken to assess the effect of the Dutch Roundabout design, but it would be expected to significantly reduce the operational capacity of the roundabout. The degree of congestion resulting from this arrangement is expected to be unacceptable, so this layout has been discounted.
- 9.4.10 A similar level of provision could be made for pedestrians and cyclists by introducing Parallel Crossings on each arm of the roundabout. These comprise of a Zebra crossing for pedestrians and a parallel crossing for cyclists, operating on the same basis as the zebras. There would be no segregated circulatory carriageway for cyclists, but a shared cycleway/footway would extend around the full periphery of the roundabout. This second option is illustrated below.

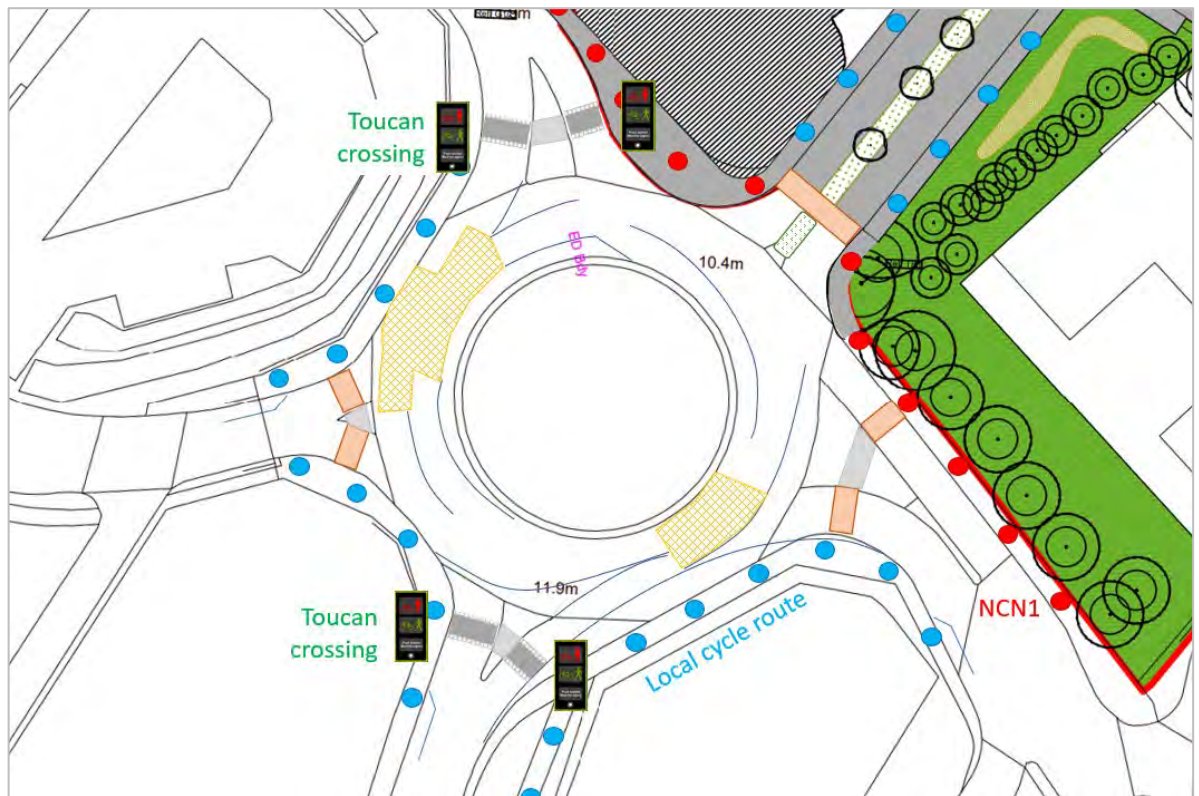
**Figure 9.5 – County Hall roundabout (Option 2, potential)**



- 9.4.11 The parallel crossings would also be expected to reduce the capacity of the roundabout but not to the same extent as the full Dutch roundabout arrangement. This option has potential and would be subject to detailed capacity modelling, formal design and an independent Stage 1 Road Safety Audit.
- 9.4.12 The third option comprises the introduction of two Toucan crossings on the A147 arms of the roundabout together with demarcated uncontrolled crossings on the three minor arms. As with option 2, a shared footway/cycleway would be provided around the outside of the roundabout. This option would not require the circulatory carriageway to be reduced and would have less of an impact on the operational capacity.
- 9.4.13 The layout is shown in sketch format below.



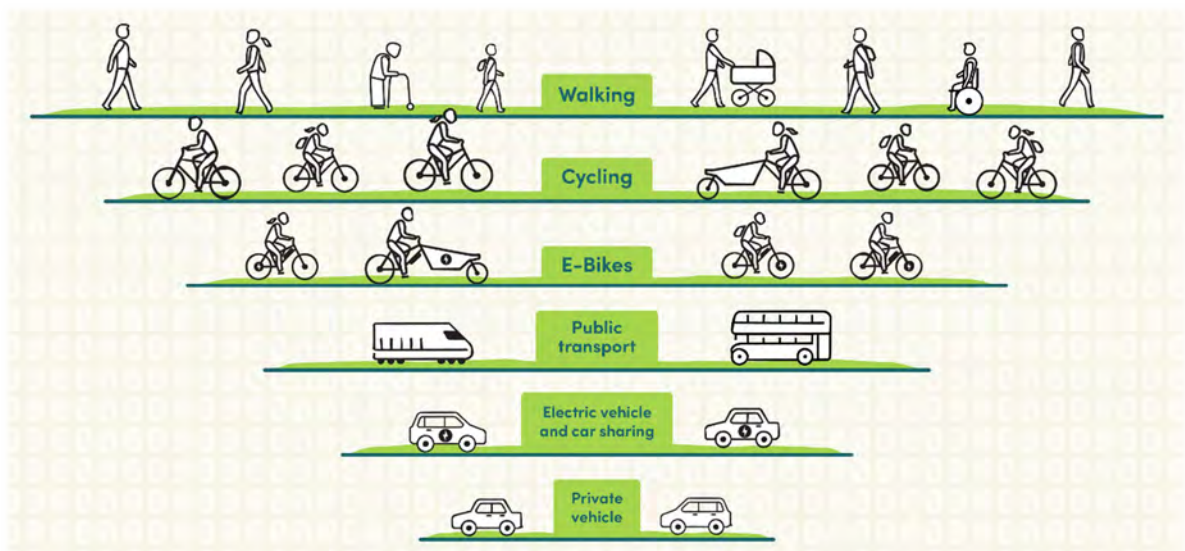
**Figure 9.6 – County Hall roundabout (Option 3, preferred)**



9.4.14 This is the preferred option and, if supported by the local highway authority, would be subject to detailed capacity modelling, formal design and an independent Stage 1 Road Safety Audit.

## 10.0 SUMMARY AND CONCLUSIONS

- 10.1.1 This Transport Assessment (TA) has been prepared by Entran Ltd in support of a hybrid planning application for a mixed-use regeneration scheme on the Carrow Works site which falls within the East Norwich Masterplan area.
- 10.1.2 This TA has been prepared alongside a Transport Implementation Strategy which provides the opportunity to reduce dependence on travel by private car and seeks to influence travel to and from the site rather than merely assessing its impact.
- 10.1.3 The development retains a number of important buildings on the site but replaces others; it comprises of new homes in the form of houses and flats together with a range of commercial and industrial employment uses.
- 10.1.4 The Movement Strategy has been designed around a hierarchy of users as follows:



- 10.1.5 The internal network has been designed around the Healthy Streets approach to reduce the dominance of vehicles and make the environment pleasant and convenient for pedestrians and cyclists so that people will choose to walk and cycle as their preferred mode of travel.
- 10.1.6 Car parking, secure cycle parking provision and landscape enhancements form an integral part of the proposals. The proposed development will be a 'low car' scheme, providing one parking space for each house and 0.2 spaces for each flat. A new Car Club will be introduced on site so that every resident will be able to use a car for essential journeys even if they do not own one. Parking will be provided for disabled drivers and . Electric Vehicle Charging Points will be installed in accordance with NCiC requirements for the residential parking, commercial parking and Car Club spaces. Secure cycle parking will be provided in accordance with NCiC standards.
- 10.1.7 The site is well placed to promote travel on foot and by bike. The development will deliver a new footbridge over the River Wensum and open up the subway beneath the rail line. This will reduce travel distances to key facilities. The development will also deliver off site transport improvements at key junctions so that they are easier and safer for pedestrians and cyclists. The redevelopment of the Carrow Works site provides an opportunity for pedestrians and cyclists to avoid certain busy roads and junctions as well as bypassing the steep hill on Bracondale and King Street.
- 10.1.8 Three new bus stops will be provided within the site, ensuring that every resident will live within 200m of a bus stop with frequent buses to a wide range of destinations.
- 10.1.9 The new footbridge will reduce the walking or cycling time to Norwich Station which provides a direct and frequent services to a wide catchment including London and Stansted airport.



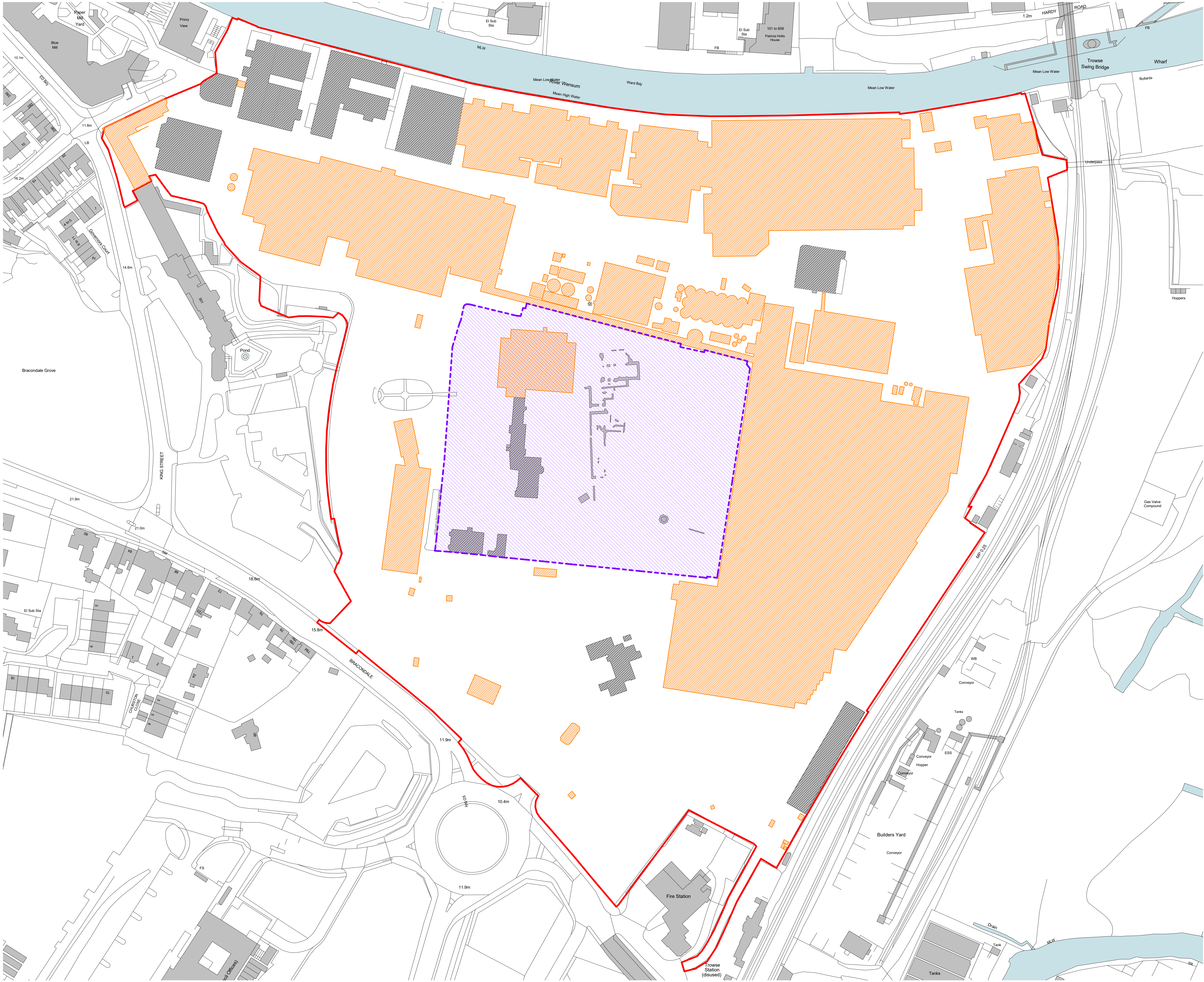
- 10.1.10 The evidence shows that the site is accessible by foot, by bike, by bus or using rail services, all of which will be enhanced by the extensive infrastructure improvements to be delivered by the development. The site is clearly well placed to promote travel by sustainable modes of transport and reduce reliance on the private car. The residents of the proposed development will have a genuine and viable choice of modes of travel.
- 10.1.11 A Residents' Travel Pack would provide key information to new residents and an opportunity to increase the number of cyclists and car-sharers and decrease the levels of single car occupancy further still. A Framework Travel Plan (FTP) for the proposed commercial uses will ensure that individual Operator Travel Plans can be prepared within a pre-agreed framework, thereby promoting sustainable travel choices across all the proposed uses on the site.
- 10.1.12 The development will be supported by a three-part Transport Implementation Strategy comprising the FTP (and Residents' Travel Pack), Construction Logistics Plan (CLP) and Delivery & Servicing Plan (DSP). Final versions of the CLP and DSP will be prepared (prior to commencement and occupation respectively) in partnership with NCoC and NCiC.
- 10.1.13 Junction capacity analyses have been carried out for a number of junctions within a defined study area. These demonstrate that the net increase in travel will result in some additional queues on pre-stressed junctions during the highway peak periods; however, the proposed mitigation measures comprise off-site infrastructure improvements to promote sustainable travel choices rather than adopting a 'predict and provide' strategy to increase capacity for private car journeys.
- 10.1.14 For the reasons set out in this Transport Statement there is no reason why the proposed development should be refused on grounds of highway capacity or safety, impact on the transport network or sustainability. The proposed regeneration of the Carrow Works site, using a sustainable Movement Strategy and a Healthy Streets approach, offers an opportunity to enhance this area with no material adverse effect on sustainable transport and should be supported by the local highway authority.



# Appendix A

## Buildings to be retained





**Notes**

Do not scale from this drawing. All contractors must visit the site and be responsible for taking and checking dimensions. All construction information should be taken from figured dimensions only. Any discrepancies between drawings, specifications and site conditions must be brought to the attention of the supervising officer. This drawing & the works depicted are the copyright of JTP.

This drawing is prepared for the specific project stage in the Drawing Status section below and it is not intended to be used for any other purpose. Whilst all reasonable efforts are used to ensure drawings are accurate, JTP accept no liability for any reliance placed on, or use made of, this plan by anyone for purposes other than those stated in the Drawing Status below.

**Key**

- Hybrid Application Boundary
- Existing Buildings To Be Retained
- Existing Buildings To Be Demolished
- Scheduled Monument

P1	27.06.22	Planning Submission.	BM	IF
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Rev	Date	Description	Drawn	Chkd

Drawing Status

**For Planning**

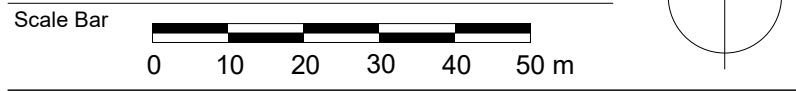
Client

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www.jtp.co.uk

Project  
**Carrow Works, Nowrich**

Drawing Title  
**Parameter Plan**  
**Demolition Plan**

Scale @A1	1 : 1000	Job Ref.	02022
Drawing No.	PP-03	Revision.	P1



Sheet Code  
**02022-JTP-PP-03 - Demolition Plan - P1**



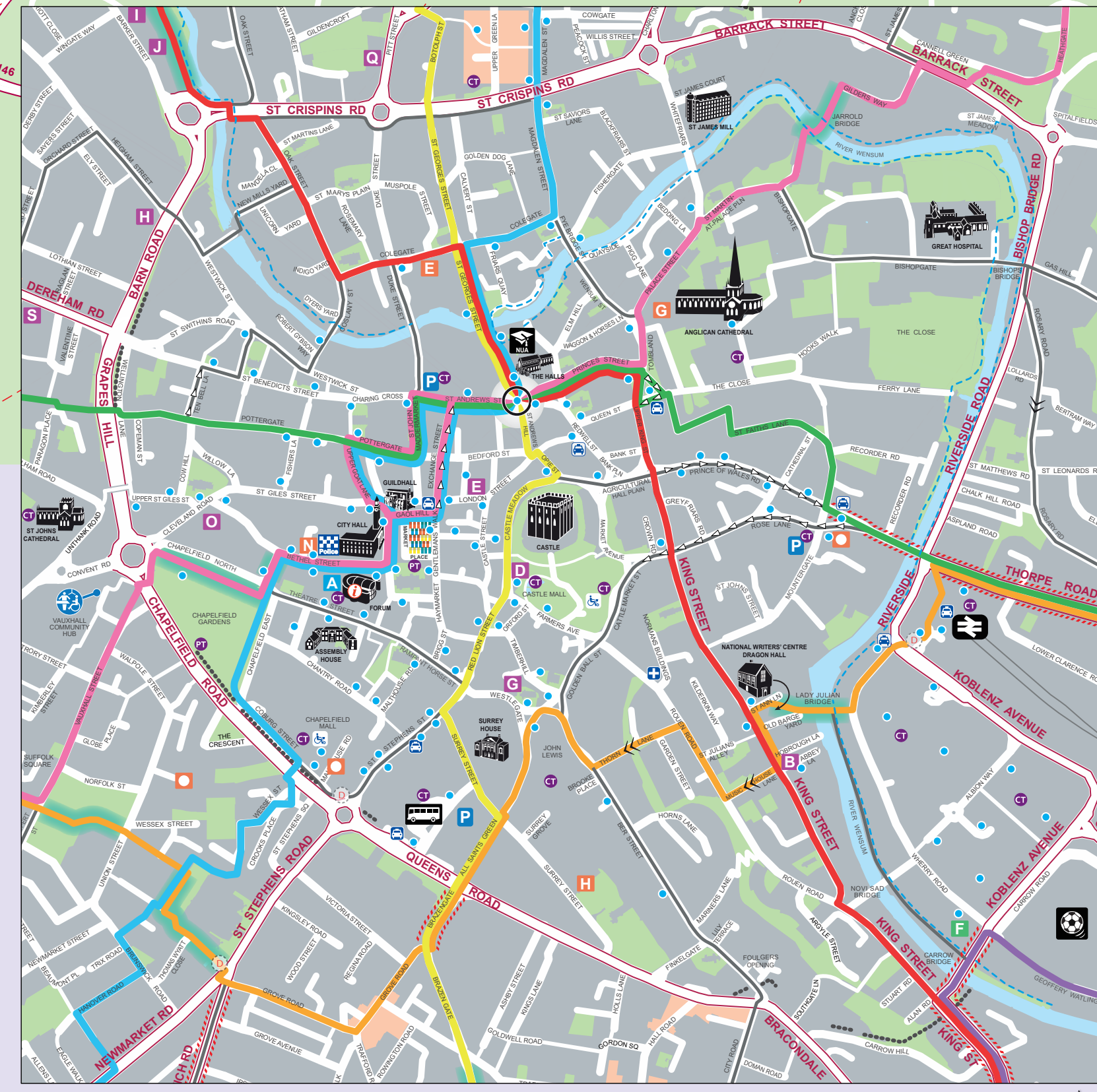
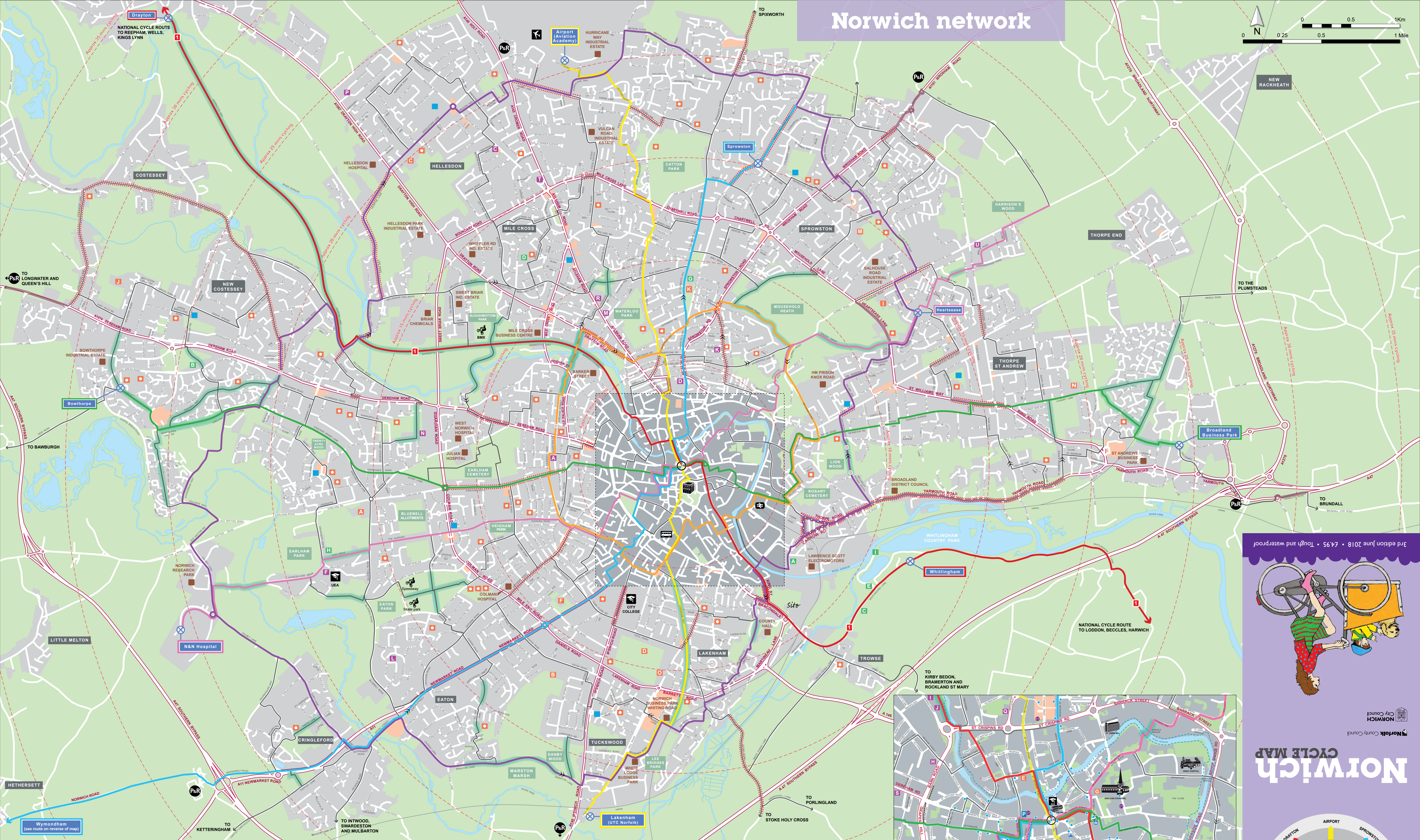


# Appendix B

## Norwich Cycle Network Plan



# Norwich network



## Norwich and beyond great to explore by bike

The pace is right to spot a bargain in a quirky shop, pause for a conversation with a friend in the park, or explore a neighbouring beauty spot. The city is compact, making it manageable to ride from the edge to the centre in under twenty minutes. For those looking for more leisurely rides, the Broads, Loddon and Wymondham can be discovered in a few hours.

### Welcome to the cycle network!

It features seven pedalways, each represented by a colour. Five cross the city from one side to the other and meet in the middle at St Andrew's Plain. Two others encircle the city – orange near the centre and purple on the edge. They are complemented by neighbourhood routes that help you get around from your home to schools and shops. Four looping leisure rides – circulars – take you into the beautiful countryside around Norwich. Discover Norwich and beyond.

Happy pedalling!

## How to use this map

### Planning your route

Use this side of the map for planning your route within Norwich. It shows where the pedalways go and how they relate to facilities. The main routes are coloured and the colours can be found on signs and stickers along the way.

Turn over to see four looping leisure rides that take you out into the beautiful countryside and neighbouring towns.

### Route conditions

The quality of the network varies from place to place and we are implementing a long-term plan to improve it. The maps show the busy traffic areas and the traffic-free parts of the pedalways and leisure routes so you can match your route to your level of cycling confidence and skill. The traffic-free parts are usually shared with pedestrians so please be considerate and use a bell. Their surfaces can also be slippery, uneven or unlit so please take care. Some parts of the network are privately owned and not maintained by the city or county councils.

## Pedalways

- Bowthorpe ↔ Broadland Business Park
- Drayton ↔ Whittingham (National Cycle Route 1)
- Lakenham ↔ Aviation Academy
- N&N Hospital ↔ Heartsease
- Wymondham ↔ Sprowston
- Inner circuit
- Outer circuit
- Neighbourhood routes
- St Andrew's Plain (centre of the network)
- Pedalway destination

## Cycle network route conditions

- Cyclists dismount
- One way
- Route along busy road (with speed limit over 20mph and without off carriageway option)
- Steep hill (arrows point uphill)
- Traffic free path

## Attractions and facilities

- Airport
- Bus station (including cycle hire)
- City wall
- Cycle sport venue
- Cycle stand parking
- Football stadium
- Higher and further education
- Local shopping centres
- Long stay secure cycle parking
- NHS walk in centre
- Norwich Market
- Park & Ride (cycle parking available)
- Riverside walk/pathway
- Toilets, public and customer
- Tourist Information Centre
- Train station (including cycle hire)

## Schools

- First, infant or primary
- City Academy Norwich
- Loddon School
- Hellesdon High
- Hewett Academy
- Jane Austen Free School
- Norwich High School for Girls
- Norwich School
- Notre Dame
- Open Academy
- Ormiston Victory Academy
- Sewell Park Academy
- Sir Isaac Newton 6th Form
- Sprowston Community Academy
- Thorpe St Andrew School
- Wherry School

## Sports facilities

- Carrow Park
- Football Development Centre
- Sewell Park Academy Sports Centre
- Norman Centre
- Norwich Rowing Club
- Riverside Leisure Centre
- Sewell Park Academy Sports Centre
- UEA Sports Park
- Whittingham Outdoor Education Centre

## Bicycle shops

- A.P. Cycles
- Bicycle Links
- City of Norwich School
- Cycle Republic
- Evans Cycles
- Go Outdoors
- Halfords
- John Borwell
- Leisure Cycles
- Mandarin
- Not About The Bike
- Pedal Revolution
- Sorens
- The Bike Man
- Wilco 'Bike' (Aylsham Rd)
- Wilco 'Bike' (Dereham Rd)
- Wilco 'Bike' (Reepham Rd)
- Wilco 'Bike' (Salhouse Rd)

## Employment areas

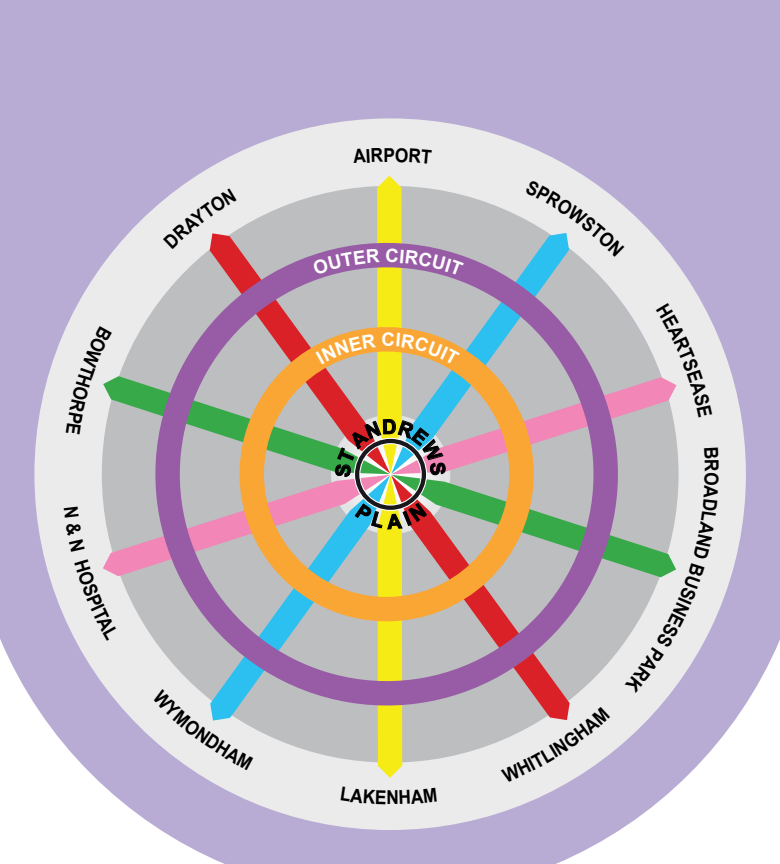
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Norfolk County Council  
City Council

# NORWICH CYCLE MAP



- Supported by:
- Broadland District Council
  - South Norfolk
  - Transport for Norwich
  - NEWANGLIA Local Strategic Partnership for Norfolk and Suffolk
  - Department for Transport
  - PUSHING AHEAD
  - NORWICH CYCLING CAMPAIGN



## Marriott's Way circular

22.6 miles / 36.4 km

### 1. Train Wood – the site of Norwich City Station

Train Wood is the site of Norwich City Station, one of three mainline stations that once served Norwich. It was the end of William Marriott's M&GN railway line and you can follow it on a bike through Hellesdon, Drayton and Thorpe Marriott and seek out the remaining platforms, gates and mile markers along the trail.

### 2. The A-Frame bridge at Drayton – views along the Wensum Valley

The first section of Marriott's Way to Drayton runs through the Wensum Valley Special Area of Conservation. The landscape hosts rare and protected birds, reptiles, mammals, plants and invertebrates. Up to ten bat species have been recorded on evening forays. The railway bridge offers great views back along the river; you might be lucky enough to see water voles and otters.



## Broads circular

24.5 miles / 39.4 km

### 3. Catton Park

Catton Park is a beautiful 70 acre country park that was the first commission of Humphry Repton as a landscape gardener. It is open at all times for people to wander through the open wildflower meadow and explore the woodland.

### 4. Ranworth Church and Broad

St Helen's Church, sometimes called the 'Cathedral of the Broads', dates from 1450 and contains painted images of saints on one of the finest tower screens in England. You can climb the church tower and look out across the Broads' landscape. Nearby is a boardwalk leading to Ranworth Broad, which passes through woodland and reed-bed habitats. At the end is the thatched and floating visitor centre run by Norfolk Wildlife Trust.



## Loddon circular

29.6 miles / 47.7 km

### 5. Loddon

Loddon sits at the heart of the southern Norfolk Broads and its lively history is reflected in its Georgian and Victorian architecture – reminders of an age when graceful wharves brought trade to Loddon along the River Chet. It's a centre for boating with shops, cafes, pubs and a market.

### 6. Caistor roman town

Venta Icenorum was founded in the valley of the River Tas during the AD60s. It was the largest and most important Roman centre of northern East Anglia. The archaeology of the site continues to be investigated to further unlock its history. Why not hop off your bike and tour the site on foot?

## Wymondham circular

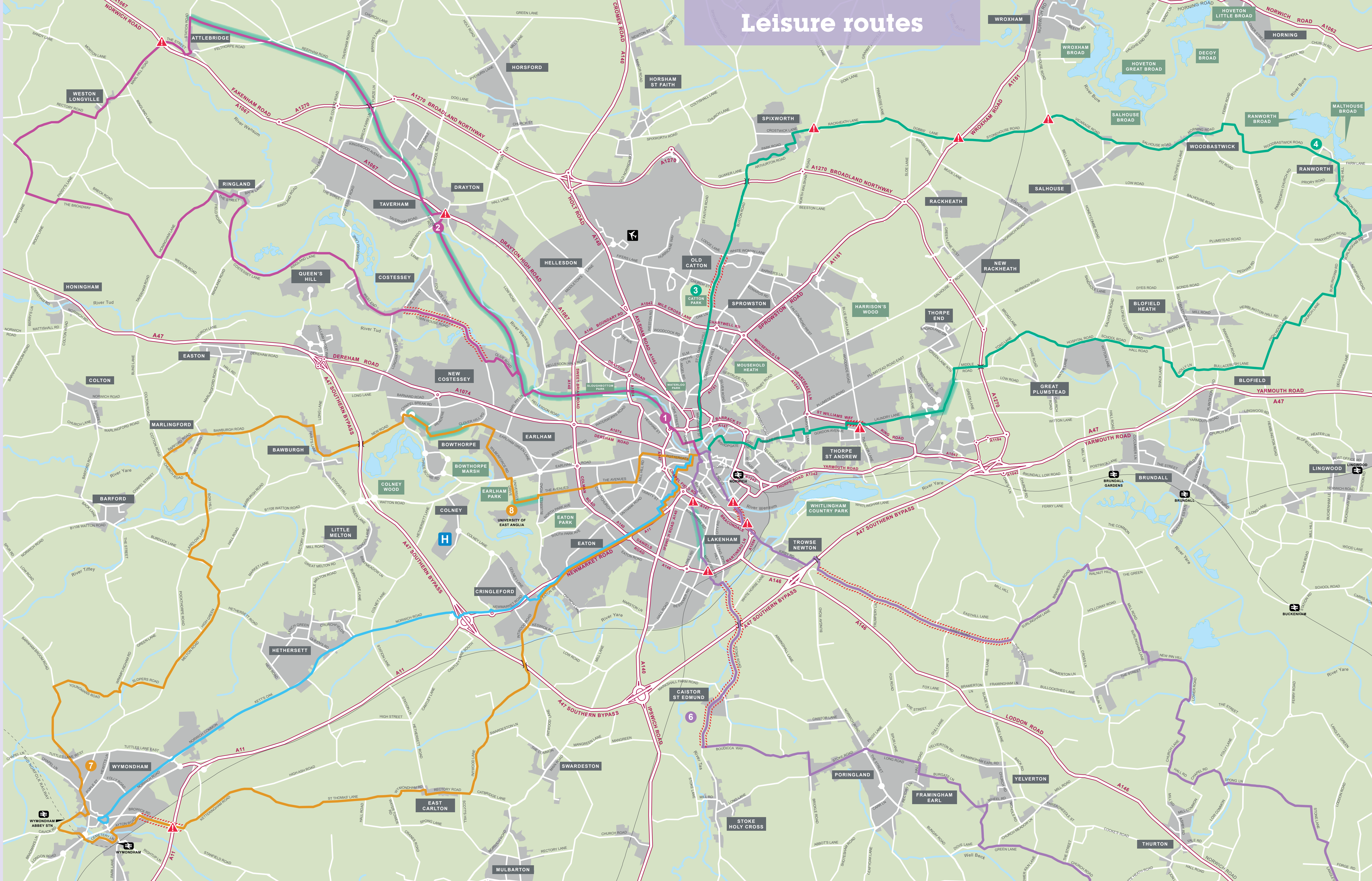
28.1 miles / 45.2 km

### 7. Wymondham

See inset map and text to the right.

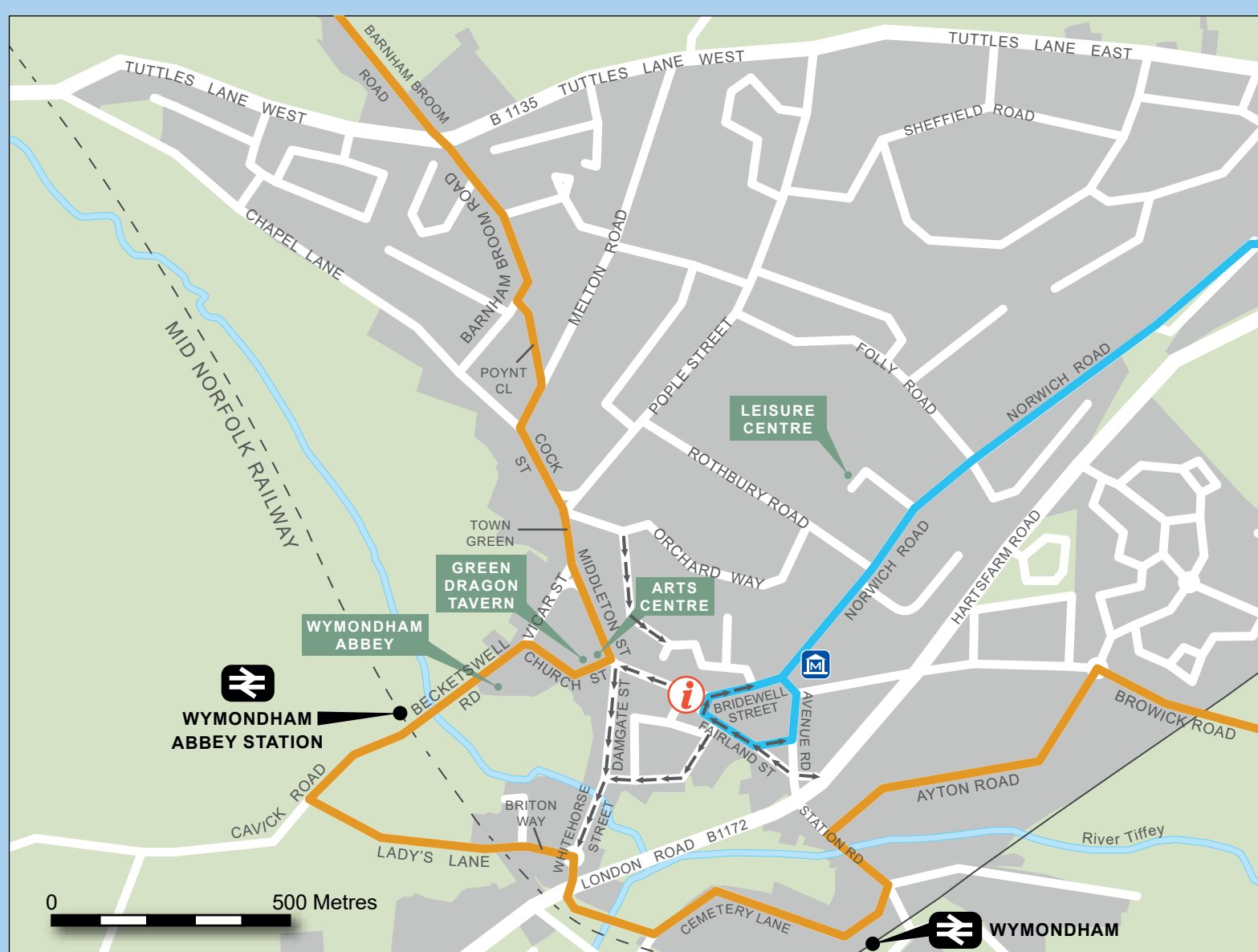
### 8. University of East Anglia (UEA)

UEA has more than 15,000 students. The campus is located in 320 acres of rolling parkland punctuated by architecturally ambitious buildings and a growing collection of sculpture. Denys Lasdun's Zigurat and Norman Foster's Sainsbury Centre for the Visual Arts face the University Broad and the valley of the River Yare. The centre contains wonderful artworks and places to eat. Another fine building is Earlham Hall, once home to the Gurney family of Quaker bankers, which sits in the middle of Earlham Park. On the edge of the park is the Enterprise Centre, the greenest building in the UK, distinctively faced with straw bales.



## Wymondham

Wymondham is a thriving market town ten miles south-west of Norwich. At its heart is a 17th century market cross, which is occupied by the tourist information centre. Wymondham is also home to the magnificent 900 year old Wymondham Abbey with its carved angels, the Green Dragon tavern dating back to the 14th century, an arts centre and a heritage museum. You can also take a steam train on the mid-Norfolk heritage railway from Wymondham Abbey to Dereham. It is a good place to break up your ride to refuel at a cafe or pub. You can also return to Norwich by train.



## Cycle network route conditions

- Bridge/tunnel over/under Broadland Northway/Southern bypass
- Busy junction or location (on leisure route, take particular care)
- One way traffic
- Route along busy road (without off carriage way option, take particular care)
- Traffic free path

## Attractions and facilities

- Airport
- Hospitals
- Tourist Information Centre
- Train station
- Wymondham Heritage Museum

## Leisure Routes

- Marriott's Way Circular
- Broads Circular
- Loddon Circular
- Wymondham Circular
- Blue pedalway (direct route to Wymondham)

## Disclaimer

The routes shown on the map are subject to change as the network develops. Some sections may be affected by construction activity and only become available later in 2018. No responsibility will be accepted by the publishers of this map for any loss, harm or injury resulting from its use.

## Feedback

What are your thoughts about this map? Please give us your feedback here:

[www.bit.ly/NorwichCycle](http://www.bit.ly/NorwichCycle)



0 0.5 1 2 3 Kilometres

0 0.5 1 2 3 Miles







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# Appendix C

## Norwich Bus Network Plan