

**CAMBRIDGE EAST SUSTAINABLE
TRANSPORT STRATEGY**

Strategy Report

Final

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Prepared for:

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A:	Technical Note A: Method statement and background to study (Appendix A);
B:	Technical Note B: Strategic choice evaluation of options (Appendix B);
C:	Technical Note C: Demand assessment (Appendix C);

1. ABOUT THE STRATEGY

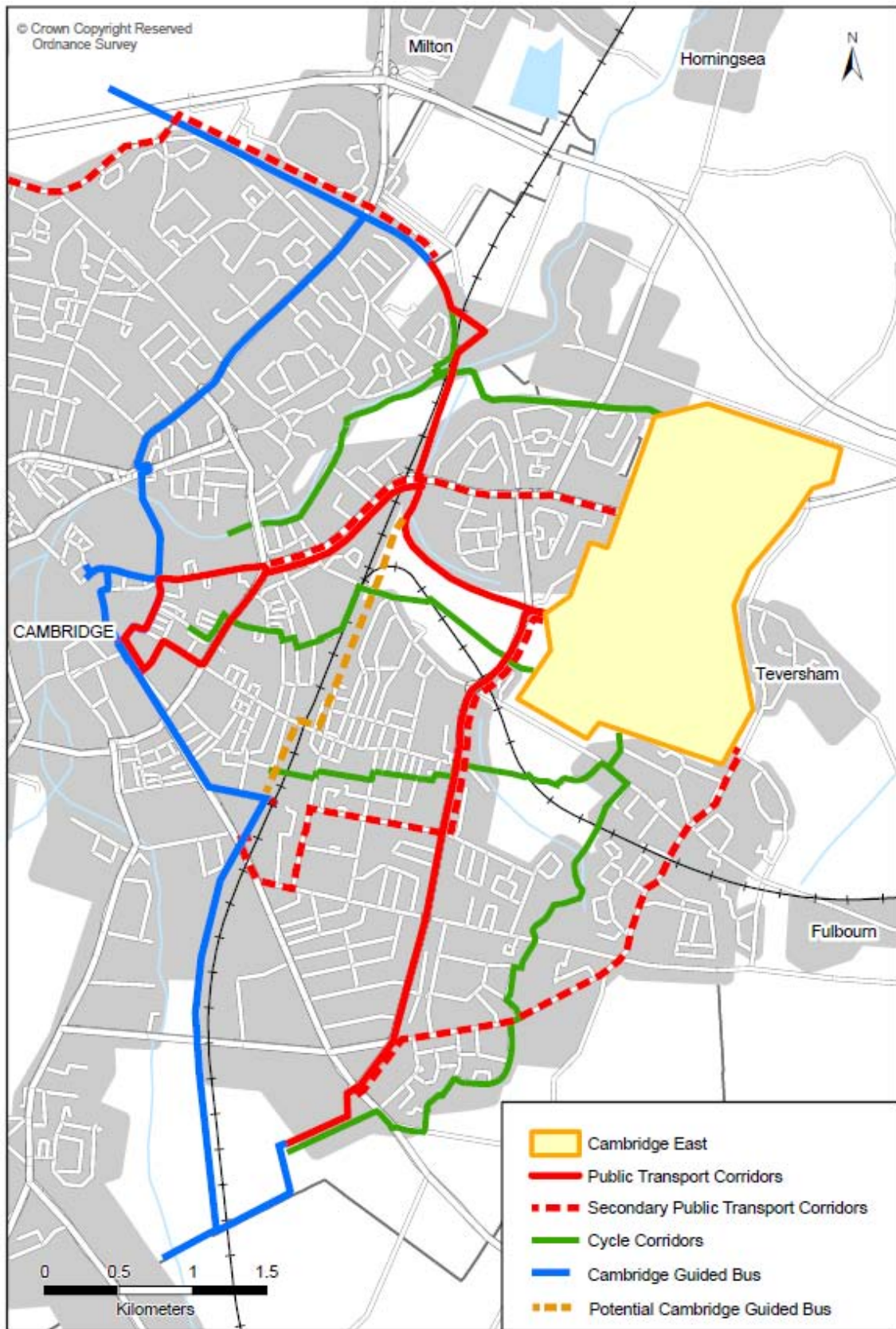
This document

- 1.1 This document provides a Transport Strategy for Cambridge East. It explains the principles behind the strategy and presents summary proposals for public transport, cycling, walking and highway enhancements (Section 2). It identifies how the strategy can be taken forward in a phased implementation approach (Section 3). Conclusions are made (Section 4) on the benefits of the strategy and the further work and validation of the strategy that is required. The Strategy sets out a range of options. It does not determine which, if any, of these options will be decided upon.
- 1.2 The summary strategy is supported by a number of technical notes including:
- Technical Note A: Background to study and method statement (Appendix A);
 - Technical Note B: Strategic choice evaluation of options (Appendix B);
 - Technical Note C: Demand assessment (Appendix C).
- 1.3 The study does not seek to determine any part of the final form of the Cambridge East Sustainable Transport Strategy. Rather it seeks only to inform Cambridgeshire County Council and the District Councils in their strategy development.

Objectives of the strategy

- 1.4 The strategy provides an overarching preferred strategy for transport provision to serve the planned 11,500 homes and 5,000 jobs at Cambridge East. Its aims are to:
- Maximise the potential for sustainable transport use and uptake through the development of appropriate public transport, walking and cycling infrastructure and services, with a specific target of achieving a 60% non-car target;
 - Minimise and mitigate negative traffic impacts on the local and strategic highway network.
 - Show how the schemes can be delivered in a phased approach to complement the phased development of Cambridge East;
- 1.5 *Technical Note A: Background to study and method statement* provides the supportive policy context to this strategy.
- 1.6 It is vital to appreciate the scale of development envisaged at Cambridge East and hence its transport requirements. If developed to its full scale, it will have a residential population of just under 30,000, as well as employment for 5,000 people and a full range of community facilities. While the transport requirements of a development of this size are significant and not without problem, Cambridge East offers a unique opportunity to provide a step-change in the quality of public transport, cycling and walking provision in this part of Cambridge, and could also support broader developments in services across Cambridge. The development has the opportunity to be an exemplar of sustainable urban extensions if the appropriate infrastructure and services are developed.

FIGURE 1.1 OVERVIEW OF PUBLIC TRANSPORT AND CYCLING PROPOSALS



Content of the strategy

1.7 The strategy proposes:

- High quality public transport links from Cambridge East into the City Centre and other key destinations;
- A dense network of high quality cycling and walking routes linking into the Cambridge network as well as leisure opportunities to the surrounding countryside;
- Traffic links to the A14 to ensure that appropriate access to the strategic network is provided without encouraging long-distance car commuting;
- Local access arrangements into the site to address general traffic needs, whilst supporting the promotion of walking, cycling and bus use as the preferred modes;
- A “smarter choices” package of measures to be delivered alongside development of Cambridge East to further embed sustainable travel practices as part of the development, including car clubs, car sharing, travel plans and information and marketing;
- A phased approach to infrastructure and service development to ensure the strategy can be practically delivered alongside the implementation of Cambridge East in distinct phases.

What the strategy does not cover

1.8 The strategy does not address the following issues:

- Proposals for the internal layout of the development, which is a more detailed planning issue that will be addressed at a later date. We do though show how the bus and cycle links from the development may come together to form a coherent network within the development and how the links between the different phases of the development will be addressed.
- Linkages with other developments in Cambridge: significant employment and housing growth is planned at the Southern Fringe (Addenbrooke’s, Trumpington), North West of Cambridge and Northern Fringe (Chesterton Sidings, Science Park etc.). There is potential for these developments cumulatively to enable particular infrastructure and services to be developed that will not be justified by one development on its own. We do identify potential scope for this - especially with regard to orbital bus services to the Northern Fringe / North West Cambridge, but this issue will have to be looked at in more detail independently of the Cambridge East strategy. The “Cambridge Area Transport Study” has subsequently been commissioned by Cambridgeshire County Council to examine these issues.
- Other transport network issues elsewhere in Cambridge: the delivery of Cambridge East (and other new developments) will require upgrades to wider parts of the transport networks in and around Cambridge. For example, proposals to improve public transport services must address bus capacity in the City Centre, but need to do so with regard to the range of public transport proposals being developed in conjunction with growth elsewhere around Cambridge. Similarly, a major barrier to increasing cycling above current levels must be lack of cycling parking at key destinations. Again this will have to be addressed as part of broader cycling strategy development. The “Cambridge Area Transport Study” will examine this.

- Detailed planning guidelines: we make some observations about build densities, parking standards and other complementary planning measures, but this is treated as a planning issue to be progressed elsewhere.
 - Recommendations on funding sources: we have sought to identify the best suite of transport measures to enable Cambridge East to achieve its sustainable transport targets. As such, we do not seek to make comments on who should pay for what infrastructure.
- 1.9 The strategy has been developed in parallel to the development of the Long Term Transport Strategy (LTTS) for the Cambridge sub-region. Subsequent work is also being underway on the Transport Investment Fund (TIF) examining the case for demand management / road user charging. While we make observations about how the strategy may complement, and be complemented by, broader transport policies and programmes, some of these policies are still in development and Cambridge East must be capable of being delivered independently from these broader considerations. In particular, whether a demand management/road user charging system is introduced and whether a Southern Orbital Route is developed will have a significant impact on the performance of Cambridge East, but the future prospect of these is currently undecided.

Conclusion

- 1.10 Cambridge East will take nearly two decades to deliver. Transport policy is evolving rapidly in response to the Cambridge sub-region being identified as a major growth area. The environmental imperative to provide alternative means of travel to the car will have strengthened.
- 1.11 It is likely that significant changes in the way transport is managed and used will have occurred before Cambridge East is complete. For example, it is probable that some form of demand management (such as road user charging) will be in place, the environmental performance of public and private vehicles will have improved and internet communications technologies continued to develop. Decisions will have been made on major new pieces of infrastructure, such as Chesterton Station and the Southern Orbital Route.
- 1.12 Therefore, our strategy seeks to identify ambitious major new infrastructure and services to promote sustainable modes, without being restricted by financial or other implementation barriers in the first instance. Where the financial case for these proposals are weak, we do propose shorter-term alternatives and show how the transport proposals will be delivered in conjunction with the phased delivery of Cambridge East.
- 1.13 But it is clear that a sustainable transport strategy for Cambridge East will need to evolve as development continues, so it can maximise the opportunities to promote sustainable modes in response to policy and physical developments.
- 1.14 Once again, we reiterate that, despite the difficulties of planning transport for a development of this size in Cambridge's context, this presents a unique opportunity to deliver a sustainable 21st century urban extension.

2. THE STRATEGY ELEMENTS

Introduction

2.1 Below, the key elements of the strategy are described:

- Public transport links to the City Centre, Northern Fringe (consisting of Chesterton sidings – a potential future rail station, the Science Park and onwards to Arbury and North West Cambridge); and Southern Fringe (consisting of Addenbrooke’s and new development in Trumpington);
- Cycling and walking links to the City Centre, Northern Fringe, Southern Fringe and recreational network;
- Strategic highways links to the A14 and local access;
- A “Smarter Choices” package of measures to embed sustainable travel within the development, including car clubs, car sharing, travel plans, information and marketing.

2.2 Some further ancillary destinations have also been identified:

- Cambridge Rail Station – as an access point for regional rail services, but also as an important area for employment and leisure and as a southern gateway to the City Centre;
- The countryside to the north and east of Cambridge East for leisure opportunities.

A) Public Transport proposals

Introduction

2.3 The Long-Term Transport Strategy, Local Transport Plan and Area Action Plan all identify a key role for public transport in addressing future transport need and acknowledge that its role needs to be increased. There is an ambition to deliver a high quality public transport network, with the Cambridgeshire Guided Busway providing the first route, but with Cambridge East offering potential to extend the system. Major recent investment in the re-branded Stagecoach ‘citi network’ has also seen patronage increase strongly over recent years, highlighting the potential for public transport to play a more major role in the future.

2.4 In keeping with the above policies, the bus transit options should include segregated running, wherever possible. The advantages of segregated running are that they:

- Maximise reliability and avoid problems associated with future traffic congestion;
- Enable higher frequency services to be operated, and hence increase capacity;
- Increase comfort and attractiveness of the bus option.

2.5 Below, we examine the options for high quality links to the City Centre, Northern Fringe and Southern Fringe. Implicit in all our proposals is a commitment to providing high quality facilities in association with the routes:

- Comfortable, sheltered waiting facilities at major boarding points;
- Level boarding facilities, through raised kerbs / protected bus stopping points;
- Fares and ticketing systems to maximise ease and speed of boarding and to offer good value and choice for customers;
- Real time information provision, at stops, on-board and away from the network (such as via mobile phones, internet, travel centres);
- High quality vehicles; fully accessible vehicles to the latest standards in terms of noise and emissions;
- Bus lane enforcement through the new powers, with vehicles fitted with cameras, to ensure that bus priorities are not abused.

2.6 Our proposals are structured as follows:

- Statement of demand: anticipated number of trips to the destination from Cambridge East when it is fully developed (i.e. 11,500 dwellings); potential number of public transport trips and mode share under a scenario with the maximum public transport option and demand management;
- Description of the two short-listed options, including route description, benefits and infrastructure issues, including where applicable, specific sub-options;
- A table providing basic information on engineering issues, costs and benefits of the two short-listed options;
- A brief description of further options that are not preferred, with the reason why they have been discounted.

1) Public transport link to the City Centre

- 2.7 The City Centre is the primary destination for Cambridge East. Modelling suggests that nearly 2,300 outbound trips could be generated from Cambridge East (when fully developed) to Market Ward during the peak hour, excluding trips to intermediate destinations.
- 2.8 We have short-listed two route options below from Cambridge East to the Elizabeth Way / Newmarket Road junction. We have not developed proposals for once the bus is across Elizabeth Way and within the City Centre. City centre bus capacity is currently constrained and Cambridgeshire County Council is currently examining options for addressing bus capacity in relation to the additional requirements of all the new developments around Cambridge.
- 2.9 Both of the short-listed options propose a fully segregated busway along the western end of Newmarket Road. The level of demand suggested in modelling work implies a high capacity public transport service is required and with existing demand along Newmarket Road, such as Park & Ride and existing city and long-distance services, full segregation on the western section of Newmarket Road will help provide adequate capacity. It is also inevitable that despite stringent efforts to maximise sustainable travel from Cambridge East, there will still be a significant volume of private traffic, much of it heading westwards along Newmarket Road. Taking existing capacity away from general traffic on Newmarket Road is therefore problematic and a further reason for requiring segregation.

Demand

- 2.10 With demand management and maximum public transport enhancements, a market share of 47% public transport is anticipated to Market Ward, with 1070 trips per hour by bus. Assuming an average double-deck bus loading of 70, this would imply 16 buses per hour, (or 21 single-deck buses per hour).

Option 1: Segregated Busway via Coldham's Common

- 2.11 A segregated bus link from the heart of the development (Phase III) running via Coldham's Common, joining Newmarket Road close to the railway and continuing on a fully segregated alignment towards the City Centre (as illustrated in Figure 2.1).

Route description

- 2.12 From the District Centre, the service would travel westwards on a bus-only route to join Barnwell Drive, with a signalised, prioritised crossing of Barnwell Road. The service would then continue to run along the northern edge of Coldham's Common on a busway, within a tree-lined avenue, to reduce visual intrusion. The busway turns northwards to join Newmarket Road adjacent to Abbey Stadium. At Newmarket Road, it will cross the railway and run via a segregated busway as far as Coldham's Lane. This busway will be on the southern side of the road, necessitating significant property and land acquisition. A major new junction would be constructed at Coldham's Lane.

- 2.13 Specific improvement proposals for the Elizabeth Way junction have not been determined due to the complexity of the junction and the consideration that the junction caters well for significant volumes of traffic at present. Further detailed work would be required to ascertain whether additional priority could be afforded to Cambridge East bus services without undue detriment to competing traffic flows. A cost has been allocated for non-specific improvement measures.
- 2.14 An additional bus service from Phase I of the development (North of Newmarket Road) would run along Newmarket Road, with some additional bus priority provided in addition to those existing at present. This route would join the segregated facility described above for the western section of Newmarket Road. In the longer-term, this bus service could continue to run via Newmarket Road or could run via the District Centre and the Coldham's Common Busway. Phase II of the development (North of Cherry Hinton) would have services crossing into Phase III of the development to the District Centre and then joining the busway onto the City Centre.

Sub-options

- 2.15 Three further sub-options for Coldham's Common have been considered:
- Running along the northern side of the Common but crossing the railway via a new bridge running between units in the retail park. At the moment this is not preferred because of the additional costs, implementation difficulties (need to move high pressure gas main) and visual intrusion that a further bridge over the railway would cause;
 - Running along the southern side of the Common in the existing public transport corridor: this is discarded as there are significant problems in accessing the railway at the south-eastern corner of Cambridge East and leaving the railway to rejoin the highway and cross the mainline around Coldham's Lane;
 - One potential option to mitigate the environmental impact of the main option proposed is to provide the Coldham's Common section of the route in a "cut and cover" tunnel. The ground conditions for doing so appear favourable. In this case, the tunnel would start on the airport site and travel under Barnwell Road, re-emerging adjacent to the Abbey Stadium. Note that the tunnelling option favours the alignment via Abbey Stadium as it would be too costly and problematic to tunnel under the mainline railway to rejoin Newmarket Road and 'surfacing' in this area to cross the railway on a bridge would be visually intrusive. Subsequently, a scoping study to assess the likely costs and technical issues of tunnelling was commissioned from Atkins. This report forms an Appendix to this commission.

Benefits

- 2.16 This option has the following benefits:
- The routing provides 100% segregation from general traffic from the centre of the development to the city-centre side of Elizabeth Way;
 - It will therefore provide direct, reliable and quick (10 minute journey time) access to the major demand point.

Engineering and feasibility issues

- Possible need to build a new structure / replacement of existing Newmarket Road structure over railway;
- Environmental objections to the use of Coldham's Common;
- On the western section of Newmarket Road:
 - Business property and land acquisition;
 - Significant utility apparatus diversions likely;
- £17m + land acquisition and compensation costs. Potential for significant utility costs;
- If option for tunnelling under Coldham's Common used, costs could be significant;
- Lack of public transport capacity in the City Centre will need to be addressed.

Option 2: Barnwell Road busway and Newmarket Road

- 2.17 A segregated bus link from the heart of the development (Phase III), but using Barnwell Road and Newmarket Road instead of Coldham's Common, before continuing on a fully segregated alignment towards the City Centre at the railway bridge (as illustrated in Figure 2.1).

Route description

- 2.18 From the District Centre, the service would travel westwards on a bus-only route to join Barnwell Drive. Buses will turn right, via a signalised, prioritised crossing of Barnwell Road and travel northwards along Barnwell Road. Bus lanes in either direction would be provided via carriageway widening. Continuous in-bound and out-bound bus lanes would be provided on Newmarket Road from an upgraded Barnwell Drive junction to the railway bridge, including right-hand priority for outbound services turning from Newmarket Road into Barnwell Road. At the railway bridge, it will have the same treatment as Option 1, with a fully segregated busway on the southern side of the existing carriageway as far as Elizabeth Way. A new bridge across the railway is likely to be required.
- 2.19 An additional bus service from Phase I of the development (North of Newmarket Road) would run along Newmarket Road, with some additional bus priority provided in addition to those existing at present. This route would join the segregated facility described above for the western section of Newmarket Road.

Benefits

- 2.20 This option has the following benefits:
- It will provide a predominantly segregated and hence a reasonably reliable service taking around 13 minutes;
 - It avoids the environmental implications of Coldham's Common;
 - The use of the section of Newmarket Road between Barnwell Road and the railway provides greater justification for bus priorities here which will be of benefit to other services travelling along Newmarket Road.

Engineering and feasibility issues

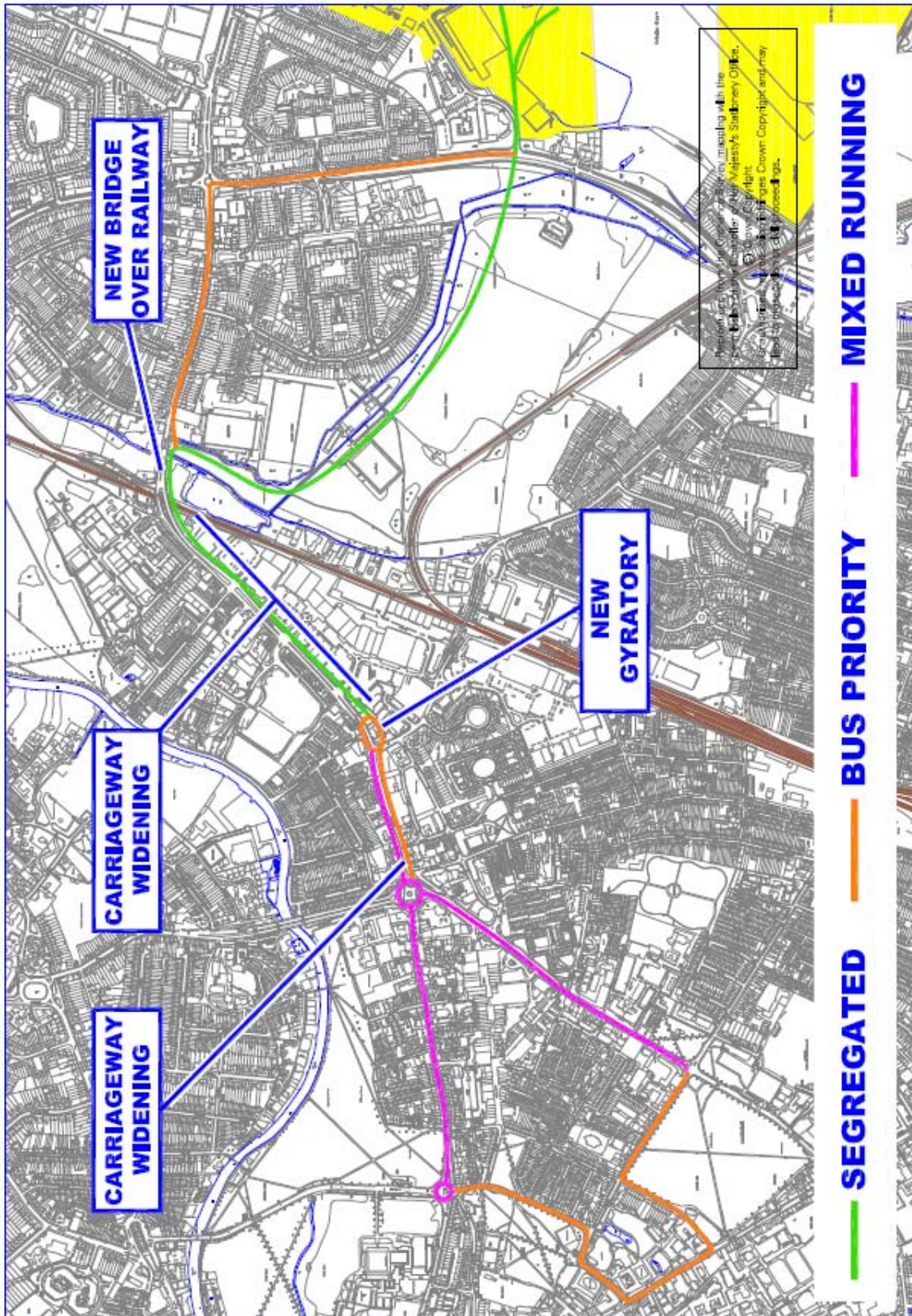
- Possible need to build a new structure / replacement of existing Newmarket Road structure over railway;
- Providing adequate priorities for outbound buses to turn right from Newmarket Road to Barnwell Road could be difficult, and buses could be subject to delay, or could cause delay to general traffic;
- Bus priorities on Newmarket Road between Barnwell Road and railway require carriageway widening which will lead to loss of trees, verges and parking, impacting on residents;
- Bus priorities on Barnwell Road will require carriageway widening which will lead to loss of verge and trees impacting on residents;
- On the western section of Newmarket Road:
 - Significant business property and land acquisition;
 - Significant utility apparatus diversions likely;
- £21m + significant land acquisition and compensation costs. Potential for significant utility costs;
- Lack of public transport capacity in the City Centre will need to be addressed;

Other options discounted

2.21 The following options were considered and discounted as not preferred:

- Running on Newmarket Road full segregation: entails significant loss of trees and verges and provides less direct routeing for services from Phase II and Phase III of development and fails to provide adequate priority to deliver the quality and capacity of service required;
- Running on Newmarket Road partial segregation: less environmental impact but fails to provide quality of service required and will not provide adequate capacity or reliability.

FIGURE 2.1 PREFERRED PUBLIC TRANSPORT LINK OPTIONS TO CITY CENTRE



2) Public transport links to the Southern Fringe

- 2.22 The Southern Fringe refers to Addenbrooke's as a large and growing employment site and visitor destination, and to planned new employment and housing around Trumpington.
- 2.23 The Southern Fringe is by far the most important destination after the City Centre with modelling suggesting nearly 1,600 outbound trips could be generated from Cambridge East (when fully developed) to Trumpington and Queen Edith's Wards over during the peak hour, excluding intermediate destinations. This reflects the significant growth in employment anticipated to come on-stream in the Southern Fringe at the same time as Cambridge East is developed. Also, the area can be expected to generate a significant volume of non-commuter trips associated with the hospital services, such as visitors and outpatients.
- 2.24 We have short-listed two route options below from Cambridge East to the Southern Fringe. It is assumed that as a part of the development plans for the Southern Fringe a public transport route through the development from Addenbrooke's, over the railway and onwards to Trumpington will be provided.

Demand

- 2.25 With demand management and maximum public transport enhancements, a market share of 36% public transport is anticipated to Queen Edith's and Trumpington wards, with 563 trips per hour by bus. Assuming an average double-deck bus loading of 70, this would imply 8 buses per hour, (or 12 single-deck buses per hour).

Option 1: Bus Priority along Outer Ring Road

- 2.26 The option consists of a segregated bus link leaving the development via Coldham's Lane and travelling along the outer ring road to Addenbrooke's and then onwards through Addenbrooke's and over the railway to Trumpington.
- 2.27 While The Outer Ring Road (Perne Road etc.) provides a direct link between Cambridge East and Addenbrooke's, it is currently a congested corridor and future growth in east Cambridge could exacerbate this. If a demand management regime were introduced or the Southern Orbital Route implemented, this could potentially partially de-traffic The Outer Ring Road enabling a reliable bus service to be operated with partial bus priority only – described as one of the sub-options below. In the absence of one or both of these measures, it is likely that traffic levels on the road would remain at or above capacity and therefore complete segregation would be required for the bus to operate a reliable and high capacity service.

Route description

- 2.28 From the District Centre, the service would travel southwards via a dedicated public transport, cycling and walking bridge over the 'Green Wedge' into Phase II of the development. It would then travel south westwards to exit the development at its south westernmost corner on Coldham's Lane, via a bus only signalised junction. This junction would be used to hold traffic travelling along Coldham's Lane towards the City Centre to ensure that the stretch of Coldham's Lane under the railway bridge and

to the roundabout with Barnwell Road remains reasonably free-flowing. From there, buses would turn left onto the outer ring road. Bus priorities would be provided in the form of nearside bus lanes in both directions.

- 2.29 An extension to the existing citi service from Cherry Hinton to Addenbrooke's to the City Centre would provide an additional bus service to Addenbrooke's from the south-eastern part of the development. There is little scope for bus priority along this route. This service will provide an important link for in-bound travel to Cambridge East from Cherry Hinton and south east Cambridge.

Sub-options

- 2.30 Various sub-options existing with this proposal:

- Alternative access point: if access onto and movement along Coldham's Lane proved difficult, buses could continue along Barnwell Road and access the development at the Barnwell Drive junction used by buses heading towards the City Centre. Provision of bus priority through highway widening along Barnwell Road to the Coldham's Lane junction would be straightforward here because of available land within the highway boundary;
- Partial bus lane scheme: if other measures are implemented (such as demand management and/or the Southern Orbital Route), traffic levels could be reduced on the outer ring road, the bus link to the Southern Fringe could be accomplished by partial bus lanes only. These could take one of two forms:
 - Nearside bus lanes on the approaches to each junction (so that in effect there is one bus lane along the length of the road, rather than two);
 - A bus way in the centre of the road which is used by buses approaching a junction. Once the bus passes through the junction, it moves left into the general traffic lane.

Benefits

- 2.31 This option has the following benefits:

- Unhindered bus access along this corridor allows direct, reliable, quick access (16 minutes journey time) to Addenbrooke's and beyond into the Southern Fringe;
- The level of demand suggested in modelling work implies a high capacity public transport service is required and in order to provide this, the reliability that bus priority provides is required;

Engineering and feasibility issues

- Provision of bus lanes along The Outer Ring Road will entail loss of trees, green verge and off-road parking, although this would be less with the partial bus lane scheme;
- Modelling also suggests a very strong level of demand for private traffic along this corridor, so without priorities, the buses will be liable to become heavily delayed, reducing the capacity and quality of service.
- Cost of £12.5m.

Option 2: Bus service via Rail Station and Guideway

- 2.32 An on-road service to the rail station, via the northern section of the outer ring road and then through Coleridge, offering the potential to join the Cambridgeshire Guided Busway south towards Trumpington / Addenbrooke's or to travel onwards to the City Centre.

Route description

- 2.33 From the District Centre, the service would travel southwards via a dedicated public transport, cycling and walking bridge over the 'Green Wedge' into Phase II of the development. It would then travel southwestwards to exit the development at its southwesternmost corner on Coldham's Lane, via a bus only signalised junction. This junction would be used to hold traffic travelling along Coldham's Lane towards the City Centre to ensure that the stretch of Coldham's Lane under the railway bridge and to the roundabout with Barnwell Road remains reasonably free-flowing. From there, buses would turn left onto Brooks Road. Bus priorities would be provided along the stretch from Coldham's Lane as far as Davy Road, where buses would turn right. Buses would then continue towards the eastern approach to the rail station before turning left into Rustat Road. They would turn right onto Cherry Hinton Road via a priority signal and follow an in-bound bus lane to turn right into Hills Road. Once over the railway, they would turn right towards the rail station via the new bus/taxi only access into the CB1 development. They would turn in front of the rail station in order to access the Cambridgeshire Guided Busway to travel southwards towards Addenbrooke's and Trumpington.

Sub-options

- 2.34 If the Guideway south of the rail station were to become the preferential route to access the Southern Fringe, a more ambitious proposal to connect from Cambridge East to the rail station would be to develop the 'missing link' of Guideway along the railway between Newmarket Road and the rail station. Services from Cambridge East would proceed along the segregated route as far as Newmarket Road, as per city centre routeings and then turn south to run alongside the railway to join the southern section of Guideway at the rail station to travel onwards to Trumpington/Addenbrooke's. The exact entry point and alignment along the railway would require more detailed work.
- 2.35 Such a bold proposal would only be envisaged in association with Guideway also being implemented between Chesterton Station and Newmarket Road (see Northern Fringe section below), which would provide a continuous north to south segregated high quality public transport route from the Cambridge Northern Fringe and beyond to the Southern Fringe.

Benefits

- 2.36 This option has the following benefits:
- It reduces the potential loss of trees, verge and parking on the outer ring road south of Davy Road;

- It provides an intermediate link to the rail station, giving access to rail services, but also to a major employment and leisure area;
- It exploits existing guideway infrastructure for the stretch from the rail station to the Southern Fringe.

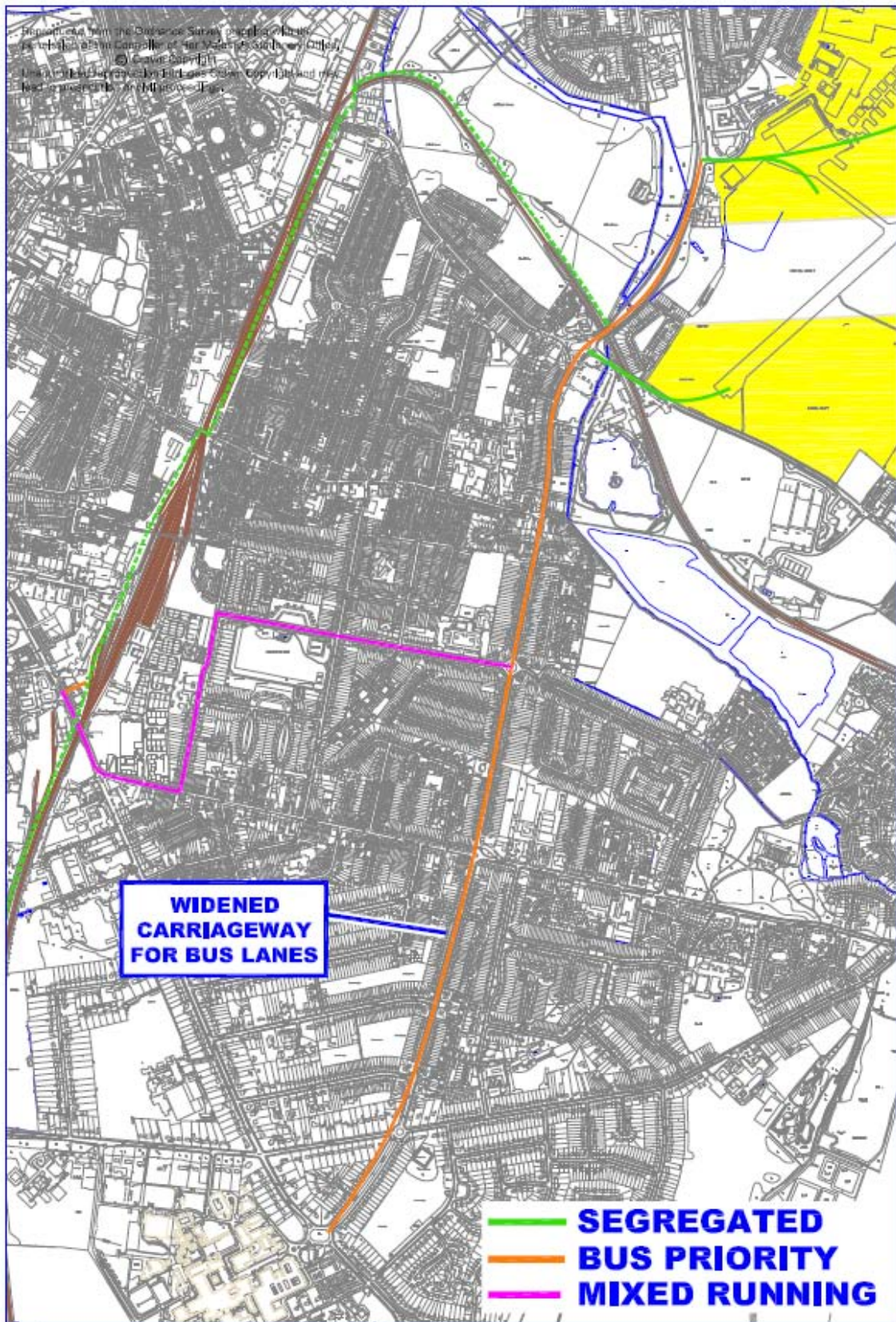
Engineering and feasibility issues

- This route is long and creates unattractive journey times (26 minutes to Addenbrooke's, compared to 16 on the direct routeing). Journey times to Trumpington are more comparable (25 minutes via the guideway, compared to 20 minutes via the Outer Ring Road routeing). However, it is estimated that without any improvements along the Outer Ring Road, this route would be quicker;
- In addition, it requires the same level of priority to be provided on the section of the outer ring road from Coldham's Lane to Davy Road, as with the Outer Ring Road proposal, entailing loss of trees, verges and off-street parking;
- Cost of £6.0m.

Other options discounted

- 2.37 Serving the Southern Fringe via Cherry Hinton was considered and is acknowledged as an important secondary route to provide access to the Southern Fringe, but also access to Cambridge East from residential areas of southeast Cambridge. However, the corridor is constrained and congested, with little possibility of bus priorities, so it is considered inadequate to provide the quantity and quality of public transport services required.

FIGURE 2.2 PREFERRED PUBLIC TRANSPORT LINK OPTIONS TO SOUTHERN FRINGE



3) Public transport links to the Northern Fringe

- 2.38 The Northern Fringe comprises a range of housing and employment developments from North West Cambridge through Arbury Park to the Cambridge Regional College / Science Park and on to Chesterton Sidings / Cambridge Northern Fringe East and therefore presents a potentially strong, though dispersed set of destinations.
- 2.39 Modelling work by Atkins suggests over 550 trips per peak hour could be generated to the Northern Fringe. Given the scale of development here, this seems a relatively low figure. The reason for this appears to be that the phasing of development here is ahead of Cambridge East, so most of the employment will be taken before Cambridge East comes on-stream, unlike the Southern Fringe where much of the employment creation will take place at the same time that Cambridge East is constructed. However, there could be significant in-bound demand to Cambridge East from the Northern Fringe to access employment, education and community facilities here from the new populations of the Northern Fringe.
- 2.40 We have short-listed two route options below. One is an ambitious proposal to create a major new public transport link from the east of Cambridge to the north of Cambridge. In the absence of such a link, the alternative would simply be to travel via existing routes into the centre of Cambridge and then back out again via the appropriate service (e.g. Madingley Road / Huntingdon Road for Cambridge NorthWest, Histon Road for Arbury Park and Milton Road for Science Park /Northern Fringe East).
- 2.41 The case for major new infrastructure solely to connect Cambridge East and the Northern Fringe is difficult to justify on demand grounds of flows between Cambridge East and the Northern Fringe. However, the scheme has potentially wider benefits:
- Linking Cambridge East to the proposed Chesterton station which would take demand away from the current Cambridge station;
 - Providing a segregated route into the City Centre, via Chesterton Station, for the Cambridgeshire Guided Bus and in so doing enabling an integrated High Quality Public Transport network to develop;
 - It would form a major link in an orbital bus transit system linking the key residential and employment centres in Cambridge (Longstanton, Cambridge North West, Arbury, Chesterton, Chesterton Sidings station, Cambridge East, Addenbrooke's and Trumpington);
 - In so doing, it allows travel between these locations avoiding the City Centre, hence alleviating City Centre bus congestion problems;
 - Assisting with the opening up of the wider Chesterton site for future development and consolidating access to this area, including closure of the Fen Road level crossing;
 - Opportunity to extend Cambridgeshire Guided Bus southwards along the railway from Newmarket Road to the rail station, enabling services from Cambridge East to the Southern Fringe to travel on fully segregated route via guideway, as well as providing a complete north to south guideway from Cambridge Northern Fringe to the Southern Fringe.

Demand

- 2.42 With demand management and maximum public transport enhancements, a market share of 29% public transport is anticipated to the Northern Fringe destinations, with 162 trips per hour by bus. Assuming an average single-deck bus loading of 50, this would imply 4 buses per hour.

Option 1: Busway via Coldham's Common and Rail Corridor

- 2.43 A segregated bus link from the heart of the development (Phase III) running via Coldham's Common to Newmarket Road by Abbey Stadium and continuing northwards parallel to the rail corridor to Chesterton Sidings and beyond into the Northern Fringe.

Route description

- 2.44 The route would use the Coldham's Common busway (as proposed for the City Centre). When it rejoins Newmarket Road at Abbey Stadium, it would continue straight across Newmarket Road, via a signalised junction onto a new dedicated guided busway running northwards in a tree-lined avenue at the rear of the current industrial properties. It then follows the tree line northwestwards to travel alongside the railway across Ditton Meadows and over the River Cam on a new bridge. Then the buses turn right onto Fen Road, before crossing over the railway on a new structure to reach Chesterton Sidings. This new structure could accommodate general traffic from the development between the river and railway, enabling the Fen Road level crossing to be closed. At Chesterton, the route would merge with the existing guided busway, enabling an orbital service to be provided onwards to the Science Park, Arbury and North West Cambridge.

- 2.45 Figure 2.3 below provides an annotated sketch of the preferred route..

Sub-options

- 2.46 A further sub-option for this route has been identified:
- Using the western side of the rail corridor. This would still entail crossing back over the railway at Fen Road and then re-crossing the railway over a new structure in order to avoid the need for substantial property acquisition.

Benefits

- 2.47 This option has the following benefits:
- The routeing provides completely segregated running as far as Fen Road and then shares a very lightly used part of the road network. Therefore, reliable and quick access (10 minutes) to the Northern Fringe can be provided;
 - By providing a new link across the railway and river, it significantly improves access times and distances between Cambridge East and the north of Cambridge;
 - The route could enable Cambridgeshire Guided Bus services to continue onwards to the City Centre via a completely segregated route, instead of Milton Road as currently envisaged. This would also serve a future Chesterton station;

- As such, the proposal would contribute significantly to the aspiration of developing a High Quality Public Transport network in Cambridge;
- The orbital link could provide modest relief to City Centre bus congestion.

Engineering and feasibility issues

- The visual and amenity impact of crossing Ditton Meadows and the construction of a new structure across the river;
- Crossing of the mainline railway on a new bridge in terms of visual intrusion, cost and implementation difficulties;
- Proximity of route to the Leper Chapel (although the proposed alignment is 50 metres west of this historic building);
- £15.0m for the part of the route north of Newmarket Road plus Compulsory Purchase Order costs.

Option 2: Busway via Chesterton Fen

- 2.48 An alternative new busway option was considered via Chesterton Fen. This could be considered if a link road from Cambridge East to the A14 at Fen Ditton is constructed (see Highways section below).

Route description

- 2.49 Buses would exit the Northern Phase of the development onto the proposed Fen Ditton link road which would run from Newmarket Road / Airport Way junction parallel to the A14 to an upgraded junction at Fen Ditton. From there, the bus would continue straight on, parallel to the A14 via a bus-only road and cross over the river to join Fen Road. The service would travel southwards along Fen Road (unsegregated) before turning right to bridge over the railway and to arrive in Chesterton Sidings, where it can interchange with or provide onwards services to other parts of the Northern Fringe. This crossing could be a general traffic bridge, enabling the Fen Road level crossing to be closed.
- 2.50 Figure 2.3 below provides an annotated sketch of the preferred route.

Sub-options

- 2.51 Access to Fen Ditton from High Ditch Road could be closed to general traffic (to support broader policies of removing traffic from this route) and to minimise rat-running through Fen Ditton village. In this circumstance a bus gate could allow buses to travel through Fen Ditton village via High Ditch Road, before turning right towards the A14 to access the busway across Chesterton Fen.

Benefits

- 2.52 This option has the following benefits:
- By providing a new link across the railway and river, it significantly improves access times and distances between Cambridge East and the north of Cambridge;
 - Makes use of the Fen Ditton link, if pursued and segregated busway, providing fast journey times (10.5 minutes);

- Chesterton Fen could be considered to be a less environmentally sensitive area than Ditton Meadows;
- If routeing through Fen Ditton Village used, it could considerably enhance service levels/access for residents;

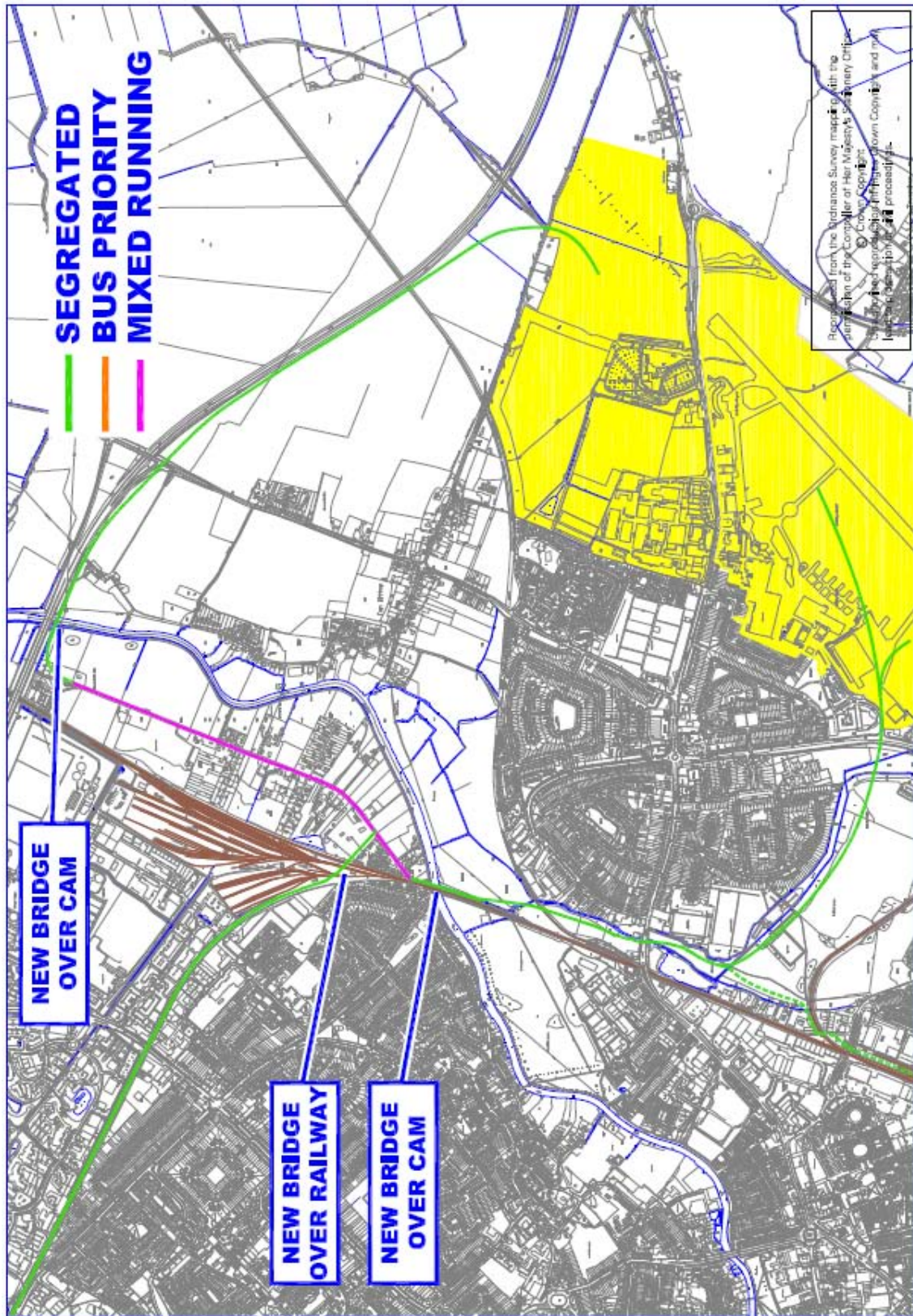
Engineering and feasibility issues

- The route is longer (25%) than the alternative via Ditton Meadows and will not provide an appropriate route to Cambridge City Centre for Cambridgeshire Guided Bus, which might undermine the economic case for the link;
- Would not provide the link for CGB services from the north into the city centre
- Relatively poor connectivity to Phases II and III
- Can only be pursued in association with Fen Ditton Link Road;
- Costs of £15.0m, excluding costs of Fen Ditton Link Road.

Other options discounted

- 2.53 The alternative option for serving the Northern Fringe is to travel via existing services going to the City Centre and then onwards to the Northern Fringe destinations from there. In the absence of the two above options being pursued, this option will be the default. It can benefit from the bus priorities between Cambridge East and the City Centre.

FIGURE 2.3 PREFERRED PUBLIC TRANSPORT LINK TO NORTHERN FRINGE



B) Cycling (and walking)

Introduction

- 2.54 This strategy proposes to provide state of the art cycling links which are capable of accommodating the volume of cycling trips required to ensure that a majority of trips are made by sustainable modes.
- 2.55 The three primary destinations of the City Centre, Northern Fringe and Southern Fringe have been primarily addressed. In creating high quality, predominantly segregated routes to these destinations, Cambridge East will effectively be plugged into the rest of the Cambridge network as well as national routes.
- 2.56 We need to provide a choice of route options for the following reasons:
- To cater for different markets from ‘professional’ cyclists who want the most direct routes and are happy to cycle on-road to ‘beginners’ who want to avoid trafficked routes;
 - To cater for the size of Cambridge East we also need to provide good penetration of the development. So, for trips to the City Centre for example, we require links from Phases I, II and III;
 - To cater for the volume of anticipated cycling trips, we need to provide adequate capacity and dispersal, as we anticipate a market share of at least 30% cycling and walking, equating to a total of nearly 4,000 walk and cycle trips per hour during the peak.
- 2.57 The routes will provide, where possible, the highest quality, state of the art facility, including:
- Direct routing to destinations;
 - Protection, where required, or an off-road route if direct;
 - Priorities for cyclists at road junctions / protection across road junctions.
 - Major new infrastructure to address pinch points / current barriers, such as cycle-accessible bridges across railways and the river;
 - Provision of continuous routes: i.e. cycling infrastructure not provided for a short section and then abandoned. If this is the major mode, we should promoting it above general traffic: e.g. looking at traffic or parking restrictions in order to enable the free-flow of cycling routes;
 - Routes that are usable year-round, and have appropriate lighting;
 - Within the development itself, high quality segregated walking and cycling routes will be provided and traffic managed to ensure pedestrians’ and cyclists’ safety and priority. Dedicated cycling, walking and public transport access will be provided between the different phases of the development making these modes the preferential way for travelling within Cambridge East.
- 2.58 It will be vital to complement these cycling proposals with broader network improvements:
- Addressing cycling parking capacity problems at key destinations, particularly the City Centre, where we anticipate new demand of 800 trips per hour;

- Route signage: network wide signing to provide clear advice on appropriate routes, coupled with distance information;
- Additional facilities to further promote cycling as a preferred mode for residents of Cambridge East, such as cycle hire, cycle training etc. (these are addressed under our “Smarter Choices” package);
- Maintenance of routes: as part of route development, an adequate maintenance programme must be committed to, to ensure that the routes are maintained to high standards and are accessible year-round.

2.59 Below, we present the cycling proposals for each of the key destinations.

2.60 The analysis focuses on cycling routes. This is because we anticipate cycling being the prevalent non-motorised modes for most destinations. However, it is anticipated that building state of the art cycling facilities into the design of Cambridge East will inherently benefit walking. We envisage that the internal links within the development and several of the external links will be appropriate for both walking and cycling. If modern design standards for widths, signing and lighting are adhered to, the off-road cycling routes can be provided as shared routes with pedestrians. We also anticipate the upgrading of several existing shared routes which are currently sub-standard, such as the Tin’s Path.

2.61 After considering the 3 primary destinations, we consider walking and cycling for leisure, and how Cambridge East will be plugged into leisure networks of rights of way and cycling routes.

1) Cycle links to the City Centre

- 2.62 Three cycling routes are proposed for upgrade / development, linking the northern, central and southern parts of the development site to different parts of the City Centre.
- 2.63 Figures 2.4 to 2.6 provide annotated sketches of each of these preferred routes.
- 2.64 Modelling suggests a modal share of 32% to the City Centre (Market ward) under a high quality public transport and demand management scenario, equating to 734 walk/cycle trips per peak hour. This excludes trips to intermediate destinations.

a) Jubilee Route

- 2.65 From the northern sector of the development to the City Centre via the River Cam and existing Jubilee Route. Heading north out of the development to join the rail trackbed to Ditton Lane, then crossing, via a new signalled toucan crossing onto the existing Jubilee Route. Upgrading of the existing section of the Jubilee Route to enhance/widen surfacing (to cater for extra levels of demand) and to provide low level lighting to make the route usable year-round. At the river a 5m width, well-lit tunnel under the railway (which is on embankment) for pedestrians and cyclists, to replace the boardwalk which is sub-standard and also causes problems for river users. Then continuing on the existing route, with widening/surface enhancements and lighting to Riverside to join the on-road route to Elizabeth Way and onwards to the City Centre.

Benefits

- A fully segregated cycle path with no sub-standard sections as far as Riverside and before sharing a 'quiet road' onwards towards the City Centre where it links with various route options to different City Centre destinations;
- Makes use of / upgrades an established cycling route;
- If a tunnel under the railway replaces the boardwalk, this would enable the full width of the river to be regained;

Engineering and feasibility issues

- The boardwalk is a serious existing pinch-point. The tunnelling option could be expensive and controversial in this environmental setting;
- Lighting of the section of route across the Meadow and widening of the surfacing in an environmentally sensitive area;
- Estimated costs of £2.1m (two thirds of which is for the tunnel).

b) Coldham's Common route

- 2.66 From the middle section of the development, a direct route across Coldham's Common to East Road. The route would leave the development at the Barnwell Drive junction with Barnwell Road and cross via a signalised junction. It would then follow the existing alignment of the footpath round the playing fields to the existing footbridge over the Ipswich railway. A new cycling bridge would be provided over the railway and a link provided to the Coldham's Lane / Cromwell Road junction. The route across Coldham's Common would be surfaced and low-level lighting provided to ensure the route is usable year-round. Via an upgraded signalised junction at

Coldham's Lane the cycling route would continue northwards along Coldham's Lane using the existing cycling bridge over the railway. At this point, it is proposed that a new cycling link is provided between the railway and the back of the Beehive Centre to link up to Sleaford Street, providing a route along quiet roads to the junction of East Road and Norfolk Street, where a cycling crossing is already provided.

- 2.67 From the southern part of the development (Phase II North of Cherry Hinton), a cycling link could be provided either via Uphall Road or a link through the southern edge of the nature reserve onto Barnwell's Road and join the Coldham's Common route at Barnwell Drive junction.
- 2.68 An alternative to the proposed route across Coldham's Common would be to run the cycle route via the proposed busway (Option 1 Public Transport Link to City Centre), and then, at the point where the busway turns northwards to rejoin Newmarket Road, the cycle route would head southwards to the existing pedestrian bridge over the railway, where it would continue towards the City Centre as indicated above.
- 2.69 Alternatives to the ambition to provide a new link between the railway and back of the Beehive Centre include:
- A route passing through the Beehive Centre car park, as existing. This is currently a mixture of shared surface and on-carriageway provision with poor transitions between them. The route also entails negotiating a mini-roundabout and one-way gyratory through a busy retail parking area and the requirement to dismount at the Coldham's Lane roundabout. In addition, the route is unadopted and outwith the control of the Highway Authority;
 - A second alternative exists via Coldham's Lane and New Street, but again, this falls short of the standard envisaged. The junction of Coldham's Lane and New Street is particularly poor. At the western end of new Street the route abruptly ends at East Road, offering poor continuity with City Centre routes.
- 2.70 Neither of these options is preferred as they do not provide the quality and capacity of cycle connection required to the City Centre, but if there are delivery problems with the preferred alignment, these represent fall back options.

Benefits

- Very direct route to the City Centre from the central part of the development with 1.3km of new segregated route and 1.2km of existing 'quiet road' routes and new bridge over the railway to provide continuous cycling link. 20% shorter-route than existing on-road route;
- Route links into the existing city network at Coldham's Lane and provides a link onwards to the City Centre at the existing East Road toucan crossing;
- The proposal for a new link between the railway and Beehive Centre will provide a step-change in the quality of facilities available at this busy and difficult part of town.

Engineering and feasibility issues

- Lighting of the section of route across Coldham's Common and hard-surfacing in an environmentally sensitive area, but still will remain relatively remote part of

route which may lead to security concerns;

- Securing a cycle link between the railway and Beehive Centre may be difficult;
- Estimated costs of £2.2m, plus land acquisition.

c) Tin's Path route

2.71 To provide access to the rail station and southern sector of the City Centre, we also propose upgrading of the Tin's Path route. From Rosemary Lane, crossing Coldham's Lane via a signalised toucan crossing and continuing southwards to join the Tin's Path via the existing cycling bridge over the railway. This pathway to be widened and adequately lit to provide safe and secure cycling. An upgrade to the wooden bridge at the end of this path providing access into Brookfields and then an upgraded signalised cycle crossing of Perne Road, turning southwards via the off-road cycle lane to reach Natal Road and continue by existing quiet roads along Marmora Road and Greville Road to Carter Bridge, and onwards to the rail station and City Centre. Given the levels of cycling anticipated, options to address the severe pinch point at the link between Marmora Road and Coleridge Road should be considered, including possible property acquisition.

2.72 In addition, cycling will be possible by Newmarket Road. Depending upon the public transport option chosen, cycling facilities on Newmarket Road should be able to be maintained or slightly enhanced.

Benefits

- Direct route to railway station / southern entrance to City Centre using segregated routes (1.4km) and quiet roads (1.5km);
- Route includes upgrades to existing network (Tin's Path widening) of benefit to wider population;

Engineering and feasibility issues

- Tin's Path section is remote and could cause security concerns;
- Land acquisition to widen Tin's Path;
- Serious pinch-point on residential roads approaching the railway station;
- Estimated costs of £0.23m.

FIGURE 2.4 PREFERRED CYCLING LINKS TO CITY CENTRE: 1) JUBILEE ROUTE

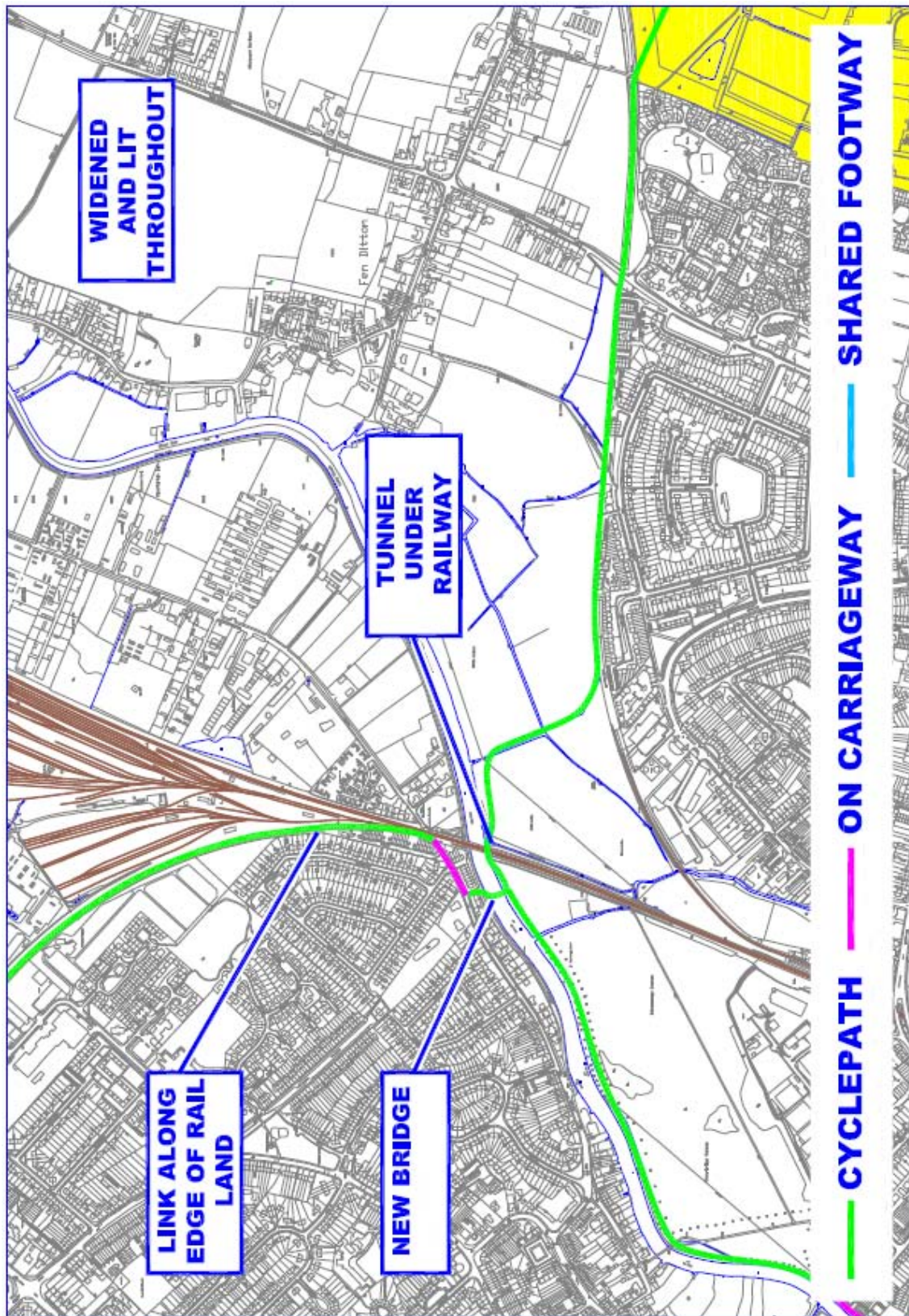


FIGURE 2.5 PREFERRED CYCLING LINKS TO CITY CENTRE: 2) COLDHAM'S COMMON

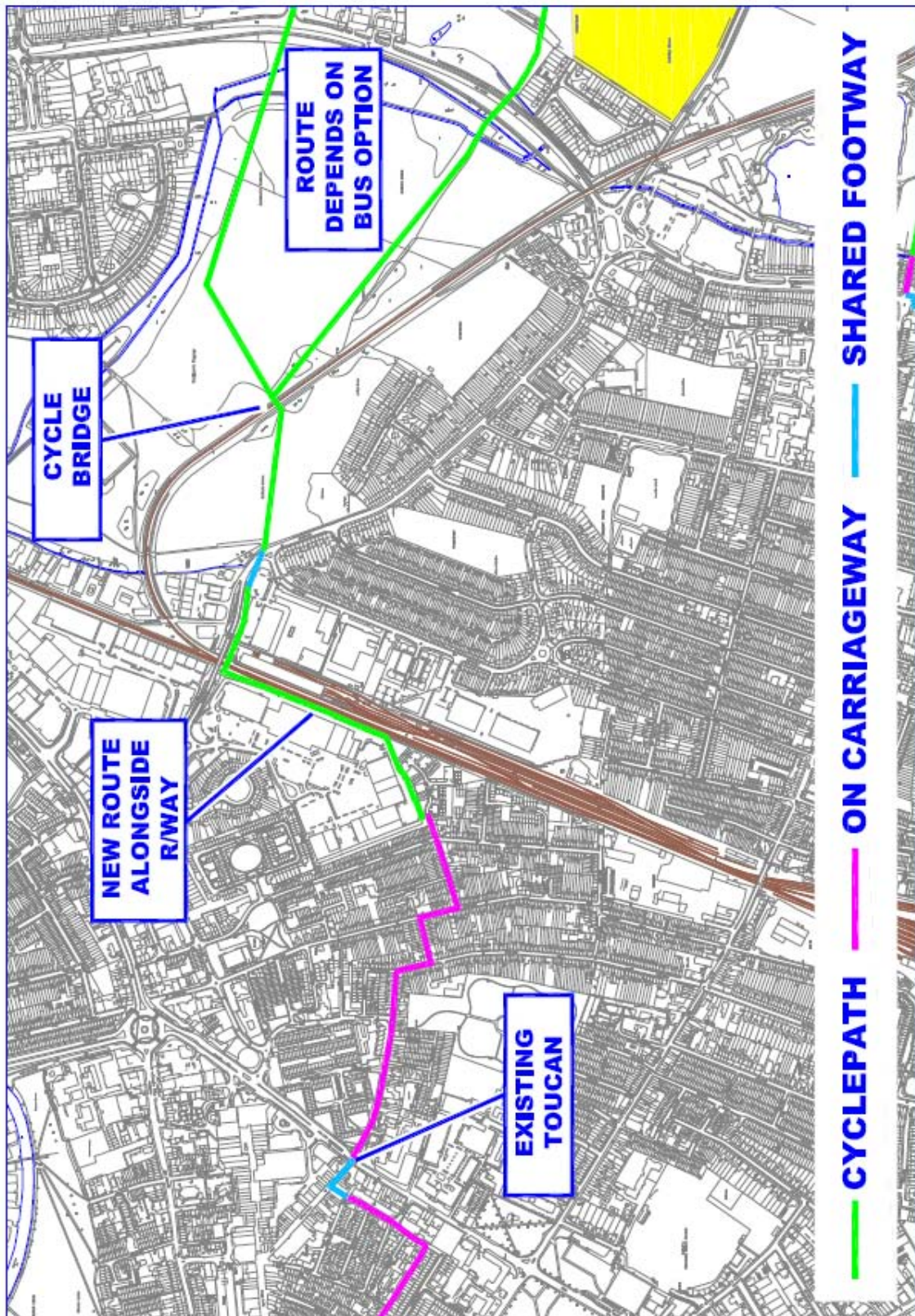
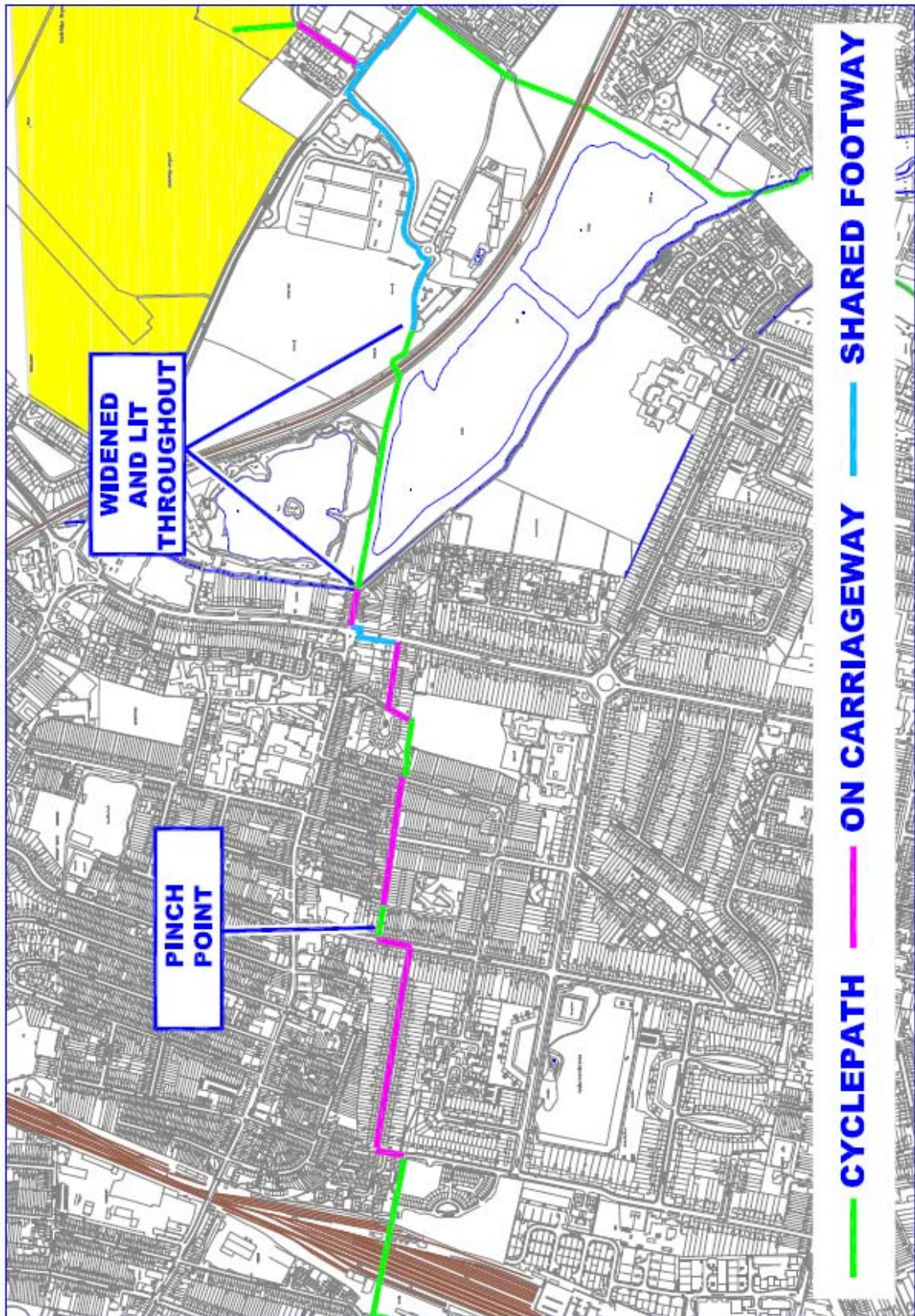


FIGURE 2.6 PREFERRED CYCLING LINKS TO CITY CENTRE: 3) TIN'S PATH



2) Cycle links to the Southern Fringe

- 2.73 There are protected cycle lanes along the length of The Outer Ring Road currently, although the number of roundabout junctions hampers safe, high quality cycling. Nonetheless, significant numbers of people already cycle towards Southern Fringe destinations. Because of the difficulties of enhancing this on-road route, and in order to encourage different markets to cycle, we have identified a predominantly off-road route / quiet road route from the south eastern edge of the development:
- 2.74 Leaving the southern edge of Phase II by Rosemary Lane and crossing Coldham's Lane via a signalised toucan junction and turning left along a cycle path parallel to Codlham's Lane. Turning right down Kathleen Elliott Way and continuing south-westwards over the railway, via a new cycling bridge and running parallel to the Gravel Pits to join the Snakey Path. Then turning westwards to follow existing track round the western side of Cherry Hinton Hall to the junction with Cherry Hinton Road. Proceeding straight across onto the existing track as far as Gunhild Way and then travelling south via Ventress Close. Continuing south on Spalding Way to the junction with Queen Edith's Way, turning right along Queen Edith's Way, via a protected junction and off-road path. Then turning left and following to the end of Almone Avene, through the alley connecting to Bowers Croft and proceeding via off-road cycle route along Wort's Causeway and Hill's Road.
- 2.75 An additional option for travel towards the Southern Fringe is along the Outer Ring Road (Perne Road etc.) in existing cycle lanes. It is difficult to improve cycling provision along this route and cyclists are not well catered for at roundabout junctions.

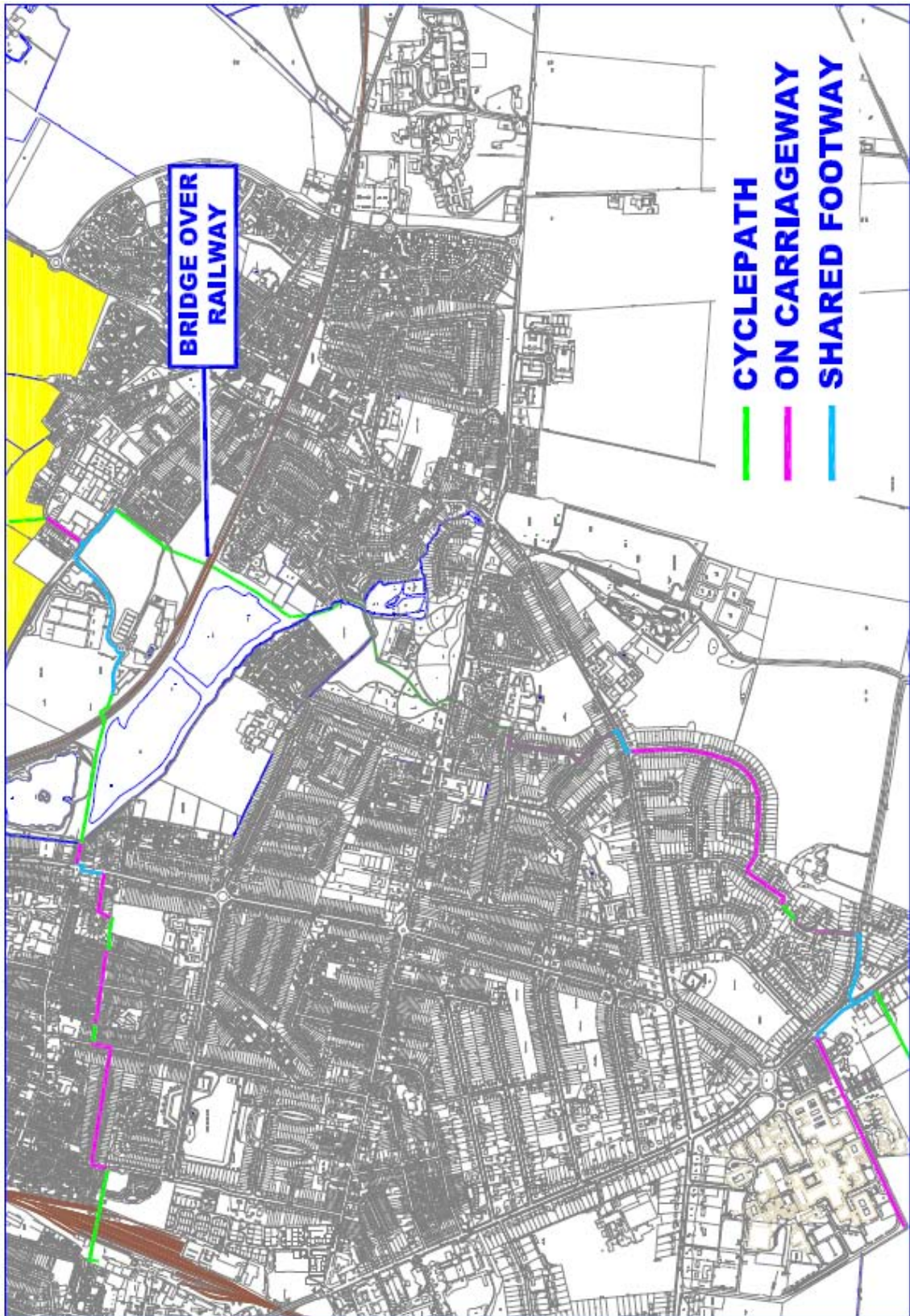
Benefits

- Continuous route providing access via segregated walk/cycle routes (1.9km) and quiet roads (1.9km);
- Route from Rosemary Lane to Snakey Path provides link between two important parts of the network currently separated;
- Catering for an estimated demand of 25% of trips to Trumpington and Queen Edith's ward, equating to 397 trips per peak hour from the new development (excluding intermediate destinations).

Engineering and feasibility issues

- Land acquisition to provide link over railway to join Snakey Path;
- Estimated costs of £1.6m.

FIGURE 2.7 PREFERRED CYCLING LINK TO SOUTHERN FRINGE



3) Cycle links to the Northern Fringe

- 2.76 It is proposed to make a connection to the Northern Fringe via the upgraded Jubilee Route, with a new bridge over the River Cam adjacent to the existing railway bridge.
- 2.77 From the northern sector of the development to the City Centre via the River Cam and existing Jubilee Route. Heading north out of the development to join the rail trackbed to Ditton Lane, then crossing, via a new signalled toucan crossing onto the existing Jubilee Route. Upgrading of the existing section of the Jubilee Route to enhance/widen surfacing (to cater for extra levels of demand) and to provide low level lighting to make the route usable year-round. Then crossing the river via a new cycling bridge parallel to the railway. This bridge could be positioned either on the western or the eastern side of the railway. It would exit the northern tow path along the river by the pedestrian link to Fen Road 80 metres to the west of the railway. From there, the route would continue via Fen Road to the railway and travel to Chesterton Station along the side of the railway (a shorter-term alternative would be to travel via Long Reach and then reach Chesterton Sidings via a path across the allotments / local nature reserve). At this point, the route joins the proposed cycleway that will run parallel to the Guided Bus route from Chesterton Sidings to Milton Road and onwards to the Science Park and beyond.
- 2.78 For the preferred route to the Northern Fringe, see Figure 2.4 (City Centre Jubilee Route).
- 2.79 Further, more detailed work is required to establish the feasibility of integrating the cycle route proposal into the Fen Road level crossing. Whilst this is the preferred solution, a fall-back alternative would be to use an on-carriageway route along Long Reach Road. This route would require an alignment through the Local Nature Reserve adjacent to the allotments area.

Benefits

- Continuous route providing almost wholly segregated access (2.4km) ;
- New bridge over River Cam substantially reduces travel distance (by 60% compared to current route) and allows continuous cycling (compared to current bridge at Green Dragon where cyclists are required to dismount);
- Provides a new link in the Cambridge network, enabling direct, segregated cycle access from the Northern Fringe of Cambridge across to the eastern side of Cambridge.
- Catering for an estimated demand of 24% of trips to Northern Fringe destinations, equating to 135 trips per peak hour from the new development.

Engineering and feasibility issues

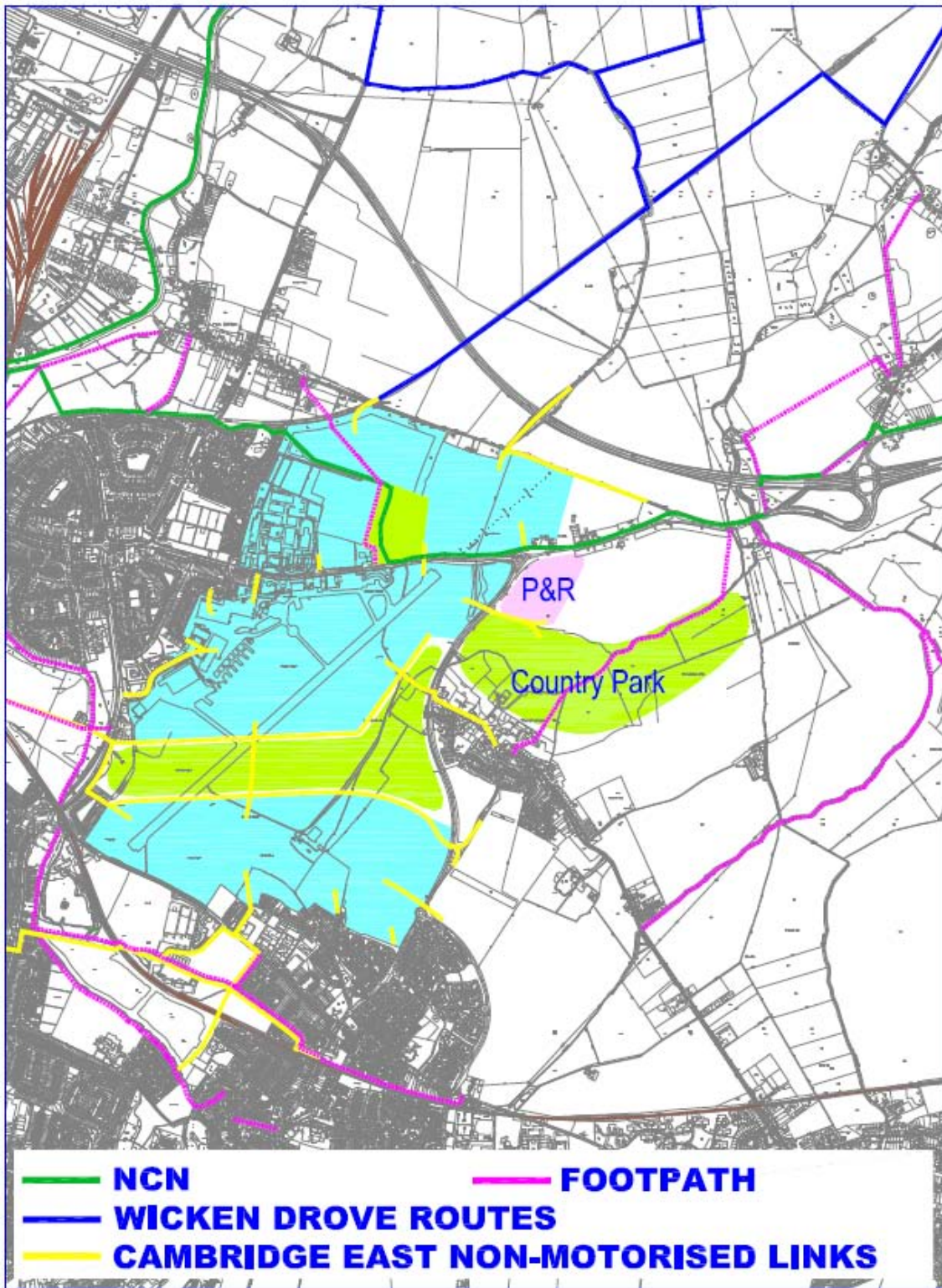
- The boardwalk is a serious existing pinch-point. The tunnelling option could be expensive and controversial in this environmental setting;
- Lighting of the section of route across the Meadow and widening of the surfacing in an environmentally sensitive area;
- Provision of cycle route alongside railway could be problematic. Alternative would require a strip of land from Local Nature Reserve;

- Cost of £1.2m for link from River to Chesterton Sidings (i.e. excluding upgrade to Jubilee Route as part of City Centre Route 1 improvement).

4) Cycle and walk links to the leisure network

- 2.80 Leisure travel represents the largest single journey purpose, although it covers a variety of activities, from visiting friends and relations, to holidays, to going on a local walk. It is also one of the most car dependent activities. Leisure travel is also growing rapidly and the proportion of these trips made by car is rising.
- 2.81 Therefore, a key element of reducing levels of car usage in Cambridge East must be to maximise opportunities for non-car based leisure. The location of the site is well-placed for this, with several local and regional leisure opportunities close by and already served by footpaths, cycle paths and bridleways.
- 2.82 The Cambridge East Area Action Plan proposes enhancements to some of the countryside recreation amenities close by, in relation to broader policies to enhance the local leisure offer, specifically, the proposed Countryside Park north of Teversham and the corridor towards Wicken Fen.
- 2.83 The network of cycle routes, footways and footpaths will be linked into the following:
- Countryside Park North of Teversham;
 - Route towards Wicken Fen via the disused rail trackbed;
 - National Cycling Network Route 51 towards Newmarket (at Newmarket Road);
 - Walk and cycle paths along the “Green Wedge” between Phases II and III of the development, travelling east-west on the northern and southern sides of the water course and onwards to Coldham’s Common and Teversham.
- 2.84 Figure 2.8 below illustrates how the internal network of walk/cycle routes could come together to provide access within the development, but also how it links to external routes, including leisure routes.

FIGURE 2.8 WALK AND CYCLE LINKS ONTO THE SURROUNDING LEISURE NETWORK

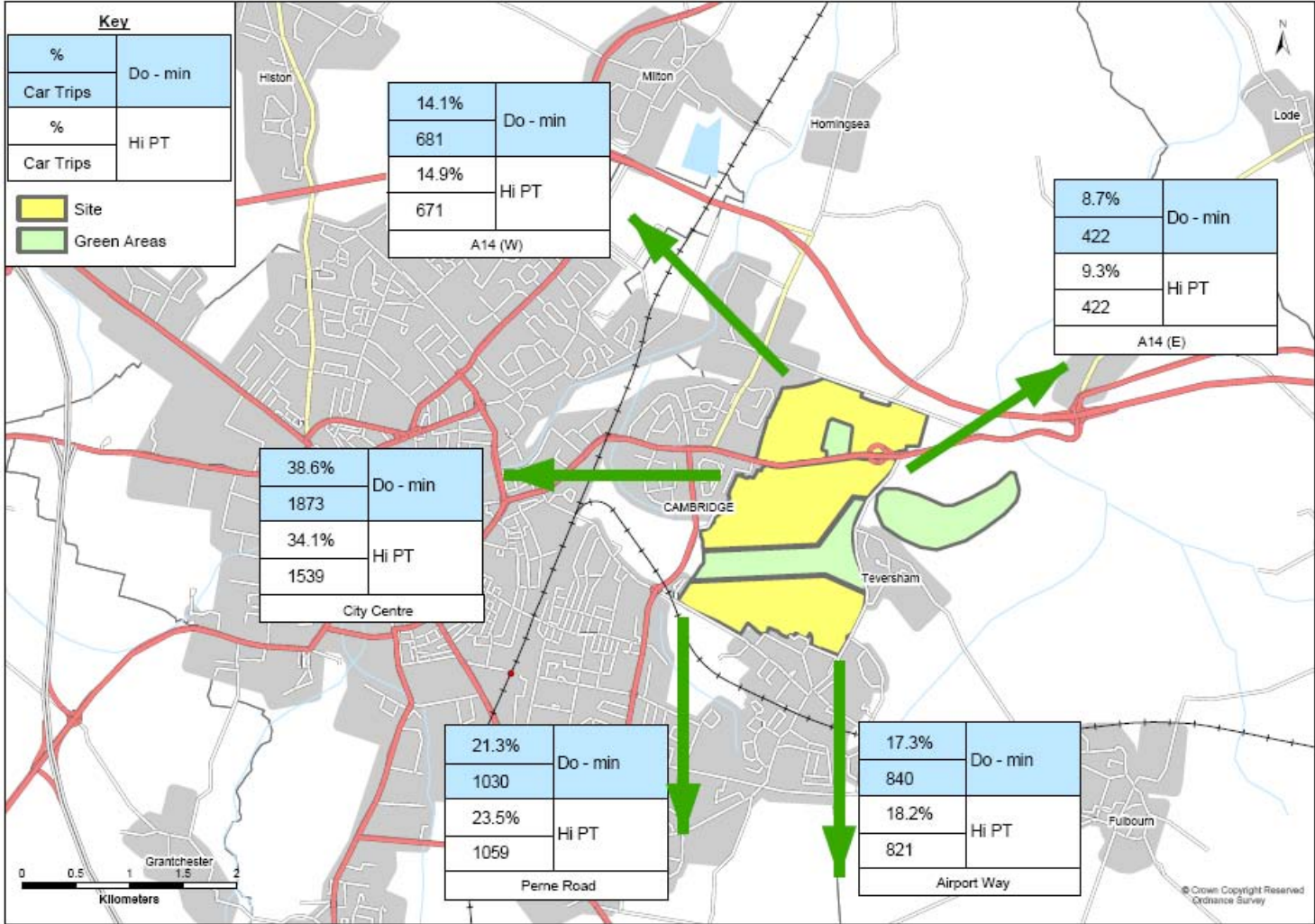


C) Highways

Introduction

- 2.85 Irrespective of the provision of high quality public transport, slow modes and smarter choices, 40-50% of the journeys generated from Cambridge East will be by car (dependent upon the demand management scenario and provision of alternatives). Modelling suggests that over 11,000 car trips will be generated during the 3-hour morning peak from 7am to 10am under the 'High Quality Public Transport and Demand Management' scenario. In the 'Do Minimum' scenario, over 14,500 car trips are anticipated.
- 2.86 In Figure 2.9 overleaf, we present the anticipated peak-hour car trips originating from Cambridge East under 5 broad destinations: Newmarket Road (for movements towards the City Centre and other west Cambridge destinations), A14 west, A14 east, The Outer Ring Road south and Airport Way south (for longer-distance southwards movements). The estimated flows are taken from modelling work by Atkins for the 'Do Minimum' scenario and the 'High Quality Public Transport plus demand management' scenario. The figures presented assume 50% of the car travel generated in the 3-hour modelled peak travel during the main peak hour.
- 2.87 In this section, we consider:
- Local access arrangements: assessing the number and location of junctions required onto the surrounding road network.
 - Upgraded access to the A14, via one of two options:
 - Improvement to Quy interchange and dualling of the Newmarket Road from Quy to Airport Way, along with restricting through traffic to travel via Fen Ditton; or
 - The provision of a new link road to Fen Ditton interchange.
- 2.88 So far as the Southern Orbital Route is concerned, we consider that the future of this route is still uncertain and Cambridge East needs to be capable of being delivered in its absence.

FIGURE 2.9 ANTICIPATED DEMAND FOR CAR TRIPS BY DIRECTION OF TRAVEL



Local access arrangements

- 2.89 In terms of the most appropriate connections from Cambridge East to the surrounding network, the modelling tests now allow us to make our recommendations for the most appropriate access arrangements, based on the following principles:
- There should be no access for private motorised traffic between Phases II and III of the development across the Green Wedge (in order to protect this landscape area, to reduce the amount of internal traffic flow within Cambridge East and to further increase the relative attractiveness of the alternative modes);
 - There should be an attempt to minimise the reliance on Newmarket Road due to congestion this road already suffers and the requirement for public transport services.
- 2.90 Examining the levels of traffic predicted from the modelling, we have assigned these to different portions of the development in order to estimate likely levels of demand for access in different directions. From this, we consider the following seven junctions are required:
- 2 junctions from the Phase I development onto Newmarket Road and the roundabout with Airport Way;
 - 2 junctions from Phase II of the development onto Airport Way (Gazelle roundabout) and Coldham's Lane;
 - 3 junctions from Phase III development onto Newmarket Road, Airport Way and Barnwell Road.
- 2.91 It would technically be possible to reduce the total number of junctions, but the size of the development and the volume of movement means that considerable delay or diversion could be entailed.
- 2.92 The detailed internal layout of the development will also need to ensure that the potential for and attractiveness of rat-running is eliminated.

Access to the A14

- 2.93 Appropriate access from Cambridge East to the A14 is required to ensure that the development is accessible, and that longer distance traffic is directed away from unsuitable routes through the built up urban area. However, it is equally important not to ‘over-provide’ access in order to ensure that long-distance trip-making is not encouraged from Cambridge East.
- 2.94 The County Council is currently undertaking a statutory planning consultation on its preferred option for the relocation of the Milton Waste Water Treatment Works to Honey Hill. The access options considered in this report are all compatible with the principles of this development.
- 2.95 The A14 is to be upgraded to 3 lanes from Fen Ditton junction westwards, but will remain a 2-lane road between Fen Ditton and Quy Interchange. It is anticipated that the majority of demand for travel to/from Cambridge East via the A14 will be in a westerly direction.
- 2.96 Two options for access to the A14 have been short-listed: upgrade to Quy interchange / access to Quy and a new link road to Fen Ditton junction. These options are illustrated in Figure 2.10.

Quy Interchange

- 2.97 Dualling of Newmarket Road from Airport Way eastwards to the Quy interchange and improvements to the roundabout junction itself. In addition, restrictions to through traffic in Fen Ditton through traffic calming and restrictions on turning capacity at the junction of Ditton Lane / Newmarket Road.

Benefits

- It is (possibly) the simplest to deliver, since it involves upgrade to an existing road, rather than creation of a new road;
- The current Newmarket Road between Airport Way and Quy Interchange is sub-standard in terms of capacity and alignment, so this would tackle an existing problem;
- By resisting the provision of a new link to the A14, it should help to dampen demand for travel via the A14 and the use of Cambridge East for long-distance car commuting.

Engineering issues and feasibility

- It entails a significant detour for westbound traffic wanting to access the A14;
- It brings westbound A14 traffic onto a 2-lane section of the A14, bringing the road closer to capacity with the implication that congestion problems are risked on this section or the A14 must be widened to dual-3;
- It makes restricting through traffic through Fen Ditton more difficult to implement and there is likely to be a considerable volume of traffic that will continue to use the shorter Fen Ditton route;
- Capital cost estimate of £7m plus land acquisition costs.

Fen Ditton Link

- 2.98 This option is for the provision of a link road from Airport Way to Fen Ditton junction, with an upgraded junction. From Airport Way, heading northwards to the junction of High Ditch Road and Low Fen Drove Way. Then running parallel to the A14 to the existing Fen Ditton junction with a new roundabout junction with Ditton Lane, opposite a remodelled westbound slip.

Benefits

- This provides access to the A14 where the road has adequate capacity (Fen Ditton) and does not necessitate a significant detour (to Quy) for the predominantly westbound movements;
- It enables the current problems of through traffic in Fen Ditton (which will be significantly worse in the future without action) to be tackled, by forcing traffic to divert around the village to travel to/from the A14.

Engineering issues and feasibility

- It entails the construction of a new road, with environmental and cost implications;
 - By providing a more bespoke solution to access to the A14, it risks encouraging more traffic generation onto the A14;
 - Capital cost estimate of £8m.
- 2.99 Table 2.1 below summarises the peak-hour traffic flows predicted along key parts of the road network under different scenarios. It shows that the Quy interchange option (Quy Upgrade plus Fen Ditton traffic management) causes an increase in the amount of traffic travelling on the A14 between Quy and Fen Ditton, an increase in traffic along the Newmarket Road west of Quy and an increase in traffic travelling via High Ditch Road, compared to the existing situation. The Fen Ditton link reduces traffic on all of these routes, with the traffic volume reassigning to the new link.

Options Discounted

- 2.100 Two options were considered:
- Developing the Fen Ditton link road and enhancing access to Quy interchange: both these measures together are deemed not necessary;
 - Developing a new junction at Honeyhill (between Quy and Fen Ditton) with the potential for closing one or both existing junctions. This would provide superlative access to Cambridge East from the A14, but this could encourage more car-based commuting. The environmental and financial costs of this option are considered to be very high.

Conclusion

- 2.101 The forecast flows for the Fen Ditton link are within capacity for a single carriageway link. The benefits of Fen Ditton Link include:
- Reduced flows through Fen Ditton Village;

- Reduced flows on Newmarket Road to the west of Quy; and importantly,
- The forecast flow on the two-lane section of the A14 east of Fen Ditton is also reduced to below Base Case levels.

2.102 It is likely that this option will be well received by the Highways Agency, assuming that the developer can demonstrate that the Fen Ditton junction remains within capacity. However, it should be recognised that the link has some deliverability risk and is likely to be more costly for the developer.

2.103 Upgrading Newmarket Road and the junction at Quy offers no relief to traffic through Fen Ditton village and results in broadly similar flows to the Base Case on the A14. If the restrictions on traffic passing through the village are introduced, flows can be reduced significantly (to levels associated with the Fen Ditton Link proposals) but the resulting increase in flow on the A14 results in westbound flows in the morning peak approaching capacity for a two-lane carriageway. Forecast flows on Newmarket Road suggest the need for improving the section east of Airport Way to two-lanes in each direction, and associated realignment to comply with current design standards.

FIGURE 2.10 HIGHWAYS OPTIONS FOR CONNECTING TO A14

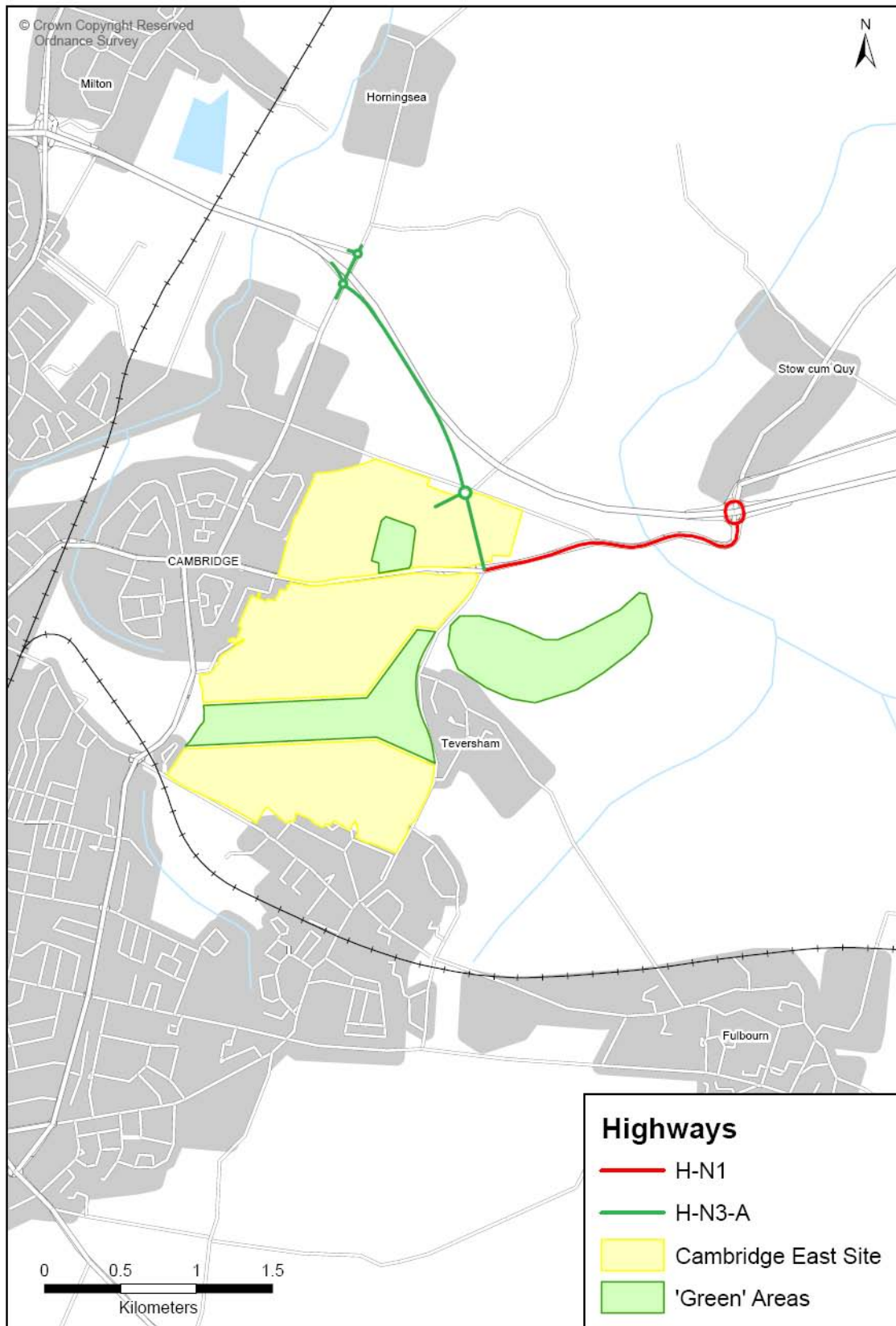


TABLE 2.1 TRAFFIC FLOWS TOWARDS A14 ON DIFFERENT LINKS UNDER DIFFERENT SCENARIOS

Scenario	A14, west of Quy			Newmarket Rd, west of Quy			High Ditch Rd, Fen Ditton			Ditton Lane, s of High Ditch Rd			Fen Ditton Link		
	east- bound	west- bound	2-way	east- bound	west- bound	2-way	east- bound	west- bound	2-way	north- bound	south- bound	2-way	east- bound	west- bound	2-way
Base Case	1670	3190	4860	1000	1500	2500	180	310	490	960	1050	2010	-	-	-
Quy upgrade only	1750	3160	4910	1060	1750	2810	120	350	470	970	1040	2010	-	-	-
Quy upgrade + Fen Ditton traffic mgt	1870	3300	5170	1120	1710	2830	60	260	320	570	680	1250	-	-	-
Fen Ditton Link + Do-min (LTTS Ref case)	1320	3020	4340	600	980	1580	-	-	-	430	820	1250	1020	1330	2350
Fen Ditton Link + High Cost PT + no DM	1340	2940	4280	590	970	1560	-	-	-	450	730	1180	1010	1350	2360
Fen Ditton Link + High Cost PT + DM	1300	2900	4200	600	1120	1720	-	-	-	400	660	1060	950	1030	1980
EXISTING 2006	1400	2880	4280	650	1560	2210	70	170	240	590	980	1570	-	-	-

D) Smarter Choices

- 2.104 Smarter Choices refers to the suite of “soft measures” that can be applied to further reduce car dependency and promote alternative modes.
- 2.105 In addition, it is recognised that hard infrastructure measures on their own (such as the public transport and cycling/walking proposals above) will not maximise their potential unless they are proactively marketed and promoted to a target audience.
- 2.106 The Smarter Choices kit includes a range of measures and we lay out below how we envisage them being implemented in Cambridge East. We recommend that the strategy is subsumed under a Site-Wide Residential Travel Plan which includes the following components:
- Employer travel plans: all employers in Cambridge East to commit (as part of planning permission) to an employer travel plan (ETP) which shows the range of measures they are taking to promote alternative travel for the journey to work, business travel and visitor travel. Standard measures, such as provision of secure cycle parking, shower facilities, mileage allowances for sustainable modes, public transport season ticket advances etc. would be incorporated and the plans would include monitoring and target setting. It may be possible to subsume individual employer travel plans within an area-wide ETP for all employers in Cambridge East. Successful travel plans have been estimated to reduce business car use by up to 25%;
 - School travel plans: a plan showing the measures a school is taking to promote the use of sustainable modes for access by staff, students and visitors. In the case of Cambridge East, this should be linked to the provision of safe routes to school as an integral part of the development design, with segregated cycle and walk routes provided around the school, and road design to enforce low traffic speeds and parking restrictions around the school gate. Successful school travel plans are estimated to reduce school-run traffic by 15%;
 - Car clubs: the setting up, or more likely, extension of a Car Club in Cambridge, providing cars available for short-term hire for club members (residents and employees), available at key locations throughout the development. It is estimated that these can achieve a reduction in mileage of 3,600km per active participant;
 - Car sharing schemes: database which residents and employees can join to match car journeys with others. It is estimated that these schemes can deliver a reduction in mileage of 4,500km per annum per active participant;
 - Individualised travel marketing: providing information and promoting sustainable travel options to target groups, such as new residents, pupils moving / leaving school etc. This bespoke service can also encompass initiatives such as cycle training. It is estimated that this can reduce residents’ car-trip making by in the region of 10%;
 - Information and promotion: generic information provision about all sustainable travel options available on-line, by phone, by text, at bus stops and at a district centre drop-in point, as well as a community-focused website for information and for discussion. Real time information facilities within the home can also be provided, so live public transport times can be checked in the house prior to departure;

- Maintaining interest in transport issues and promotion of sustainable modes: setting up a community travel forum, community travel events and other schemes (such as ‘buddy schemes’ where people are put in touch with buddies who will accompany them on cycling, walking or public transport journeys if they are lacking confidence about trying out a new trip.);
- Promotion of the use of internet communication technologies through local provision of broadband, community internet facilities at “o@sis centres”, tele- and video-conferencing facilities etc.;
- Promotion of home-delivery services to be provided by retail providers in Cambridge East;
- Welcome pack for residents containing guide to services and facilities in and around Cambridge East, cycling maps and information, booklets showing ideas for local leisure walks and cycle rides, Cambridge public transport map and bespoke timetables for Cambridge East services;
- Discount promotions for new residents: rather than providing free annual bus tickets for all residents as envisaged in the Area Action Plan, we recommend that, along with the Residents Welcome Pack, new residents are given a book of discount vouchers entitling them to a choice of discounts including:
 - Year’s free membership of Car Club;
 - Public transport season ticket pass;
 - Vouchers for free cycle training;
 - Vouchers for use at the district cycle shop redeemable for maintaining a bike, buying accessories, hiring or loaning a bike or towards buying a bicycle;
 - Discount vouchers to use at local retailers to encourage use of local amenities, plus free home delivery vouchers from relevant local retailers.

2.107 In addition, the Residential Travel Plan will also be concerned with the detailed planning of Cambridge East, in particular:

- site layout and urban design to promote permeability of the area by walking and cycling;
- site design that enables buses to permeate the site effectively, in particular direct distributor roads built to a satisfactory standard to allow unhampered bus access to housing areas;
- street layouts and patterns that ensure speed management and road safety are built in. For an exemplar of 21st century sustainable development, consideration should be given to appropriate parts of the development being designated as 20mph zones or home zones, where pedestrians are given priority over motor vehicles;
- parking standards that complement the promotion of alternative modes. For example, it is reported that the optimal parking ratio for a development to support a car club is 0.8 spaces per dwelling or less¹. and detailed design of parking to ensure that it does not dominate public spaces;
- signage for public transport, cycling and walking routes and local facilities, including recreational routes;

¹ Making Residential Travel Plans Work: Good Practice Guidelines. Dft, 2006; ref pg.24.

- provision of sufficient cycle parking, designed to a satisfactory security standard, at key destinations;
 - other aspects of the planning of the site that encourage or enable home-working (e.g. through housing design policies), home delivery (through conditions applying to retail provision) etc.
- 2.108 Smarter Choices is a nascent area of transport planning. The art of implementing these measures is likely to improve and expand and an understanding of its scale of impact and value for money will grow, so it will be appropriate to revisit the Smarter Choices Strategy over time. New measures such as preferential access to energy efficient vehicles for residents/businesses or even ideas such as carbon trading may well be established in the latter stages of Cambridge East's implementation.
- 2.109 The Government report ("Smarter Choices: Changing the Way we Travel", 2004) suggests that a co-ordinated, intensive application of such measures could deliver a reduction in car trips of up to 21% in urban peak traffic conditions. Given the already high level of cycling and public transport use we anticipate in Cambridge East, it is uncertain whether such an impact could be achieved, but we consider that an intensive application of smarter choices would make an important contribution above and beyond the infrastructure proposals laid out above, perhaps in the region of 10% further reduction in car trips.

Implementing the Smarter Choices proposals

- 2.110 For a development of this size and an ambitious and comprehensive package of this nature, it will be vital to have adequate staff resourcing. While implementation procedures will be worked out at a later stage, one mechanism would be for a travel plan co-ordinator to be employed to oversee the implementation of the Residential Travel Plan for Cambridge East, working as part of the Cambridgeshire County Council Travel Awareness Team. They would develop the Residential Travel Plan from early stages, as an important aspect of the Plan is to assist with the detailed planning stage of the application to ensure that the principles for promoting alternative modes are enshrined in the design and layout plans.
- 2.111 In terms of funding, the level of funding would have to be calculated at a later point when a detailed implementation plan is being developed, but if smarter choices are to have the sorts of impact sought, it will be significant funding. The authors of the Smarter Choices report have suggested that an "intensive application" would probably cost in the region of £5 per head of the target population per annum. Other mechanisms for calculating an appropriate spend on Smarter Choices would be to develop a full itemisation of activities and cost these, or to agree a service level agreement with the developer paying. An alternative mechanism that is being increasingly used and ensures long-term sustainability, is to use a precept, where residents pay an addition on their Council Tax. It is possible for a development like Cambridge East that residents will pay a small precept to support a range of community facilities (such as public open space etc.) and this can include support of elements of the Smarter Choices package (such as the car club, cycle training and hire, travel information centre etc.).

3. BRINGING IT ALL TOGETHER

Introduction

3.1 Section 2 presented our package of recommended infrastructure, services and other measures for Cambridge East.

3.2 Now we make comments on how the above should be implemented, focusing on:

- how the public transport and cycling proposals fit together to provide a coherent internal network within Cambridge East;
- Phasing of development of transport infrastructure;
- Providing a supportive policy and planning context.

Transport provision within Cambridge East

3.3 Whilst the focus of this strategy is on the external links from Cambridge East, one of the key aspects of creating a sustainable urban extension is to maximise the potential for internal trip-making and to ensure that walking, cycling and public transport are the modes of choice for these types of trip.

3.4 Whilst the detailed layout of Cambridge East is yet to be decided, below we show how the cycling and public transport network could come together to ensure a coherent internal network.

Public transport internal network

3.5 The key aims of public transport access within the development are to ensure that:

- all parts of the development are within 400m of a bus route;
- direct access is provided between each section of the development;
- the main district centre and local neighbourhood centres form hubs of the public transport network;
- buses enjoy direct and uninterrupted access within the development, through the provision of bus-only routes and bus gates, as appropriate. Where buses share roads with general traffic, at the detailed planning stage, it will be vital to ensure that the layout and specification of these routes enables direct, unhindered bus access to permeate the development.

3.6 Taking our proposals from Section 2, Figure 3.1 provides an illustration of how the key routes into Cambridge East could provide a coherent network to allow this.

3.7 The southern public transport links coming into Phase II from Cherry Hinton in the east and Coldham's Lane in the west help to form a natural strong spine of north-south movement through the development, up to the District Centre at the heart of Phase II via a dedicated bus, cycle and pedestrian bridge over the Green Wedge and then onwards into Phase I. The Phase I City Centre link via Newmarket Road and Southern Fringe link via Cherry Hinton would continue through the Phase I area, through the district centre to ensure that all areas of this development are within easy access of the bus route. The Park & Ride service passing through the District Centre and over Airport Way would ensure that the eastern section of Phase III has good

accessibility to public transport. From a public transport point of view, the ideal location for the main district centre is at the intersection of this main north-south, east-west spine.

- 3.8 From the demand figures in the modelling, we anticipate that some high frequency services could be justified, as shown below in Table 3.1.

TABLE 3.1 ILLUSTRATIVE POTENTIAL FREQUENCIES OF SERVICES

Service	Route	Frequency / hour
Phase I to City Centre	Via Newmarket Road	4
Phase I to City Centre	Via District Centre	4
Phase II to City Centre	Via District Centre	6
Park & Ride to City Centre	Via District Centre ^{*1}	10
Park & Ride to Southern Fringe	Via District Centre and Phase II	6
Phase I to Southern Fringe	Via District Centre, Phase II and Cherry Hinton	6
Park & Ride to Northern Fringe	Via District Centre	4
Frequencies to key destinations and on key transport links		
City Centre	Along western end of Newmarket Road ^{*2}	24
Southern Fringe		12
Northern Fringe		4

**1 Park & Ride site moved to east of Airport Way. District Centre refers to the main centre of the Airport Site in Phase III.*

**2 includes existing Park & Ride service, but excludes other existing services using Newmarket Road and potential use of corridor by Cambridgeshire Guided Bus, if link between Newmarket Road and Chesterton provided.*

Cycling and walking network

- 3.9 As for public transport, we envisage that high quality, direct walking and cycling routes will be designed into the layout and specification of the development. In Section 2, we outlined how cycling and walking links will connect into the surrounding leisure and utilitarian network (Figure 2.8). We anticipate east-west routes along the Green Wedge on either side of the water course, connected via the dedicated link over the corridor in the middle of the development. These routes enable links to the proposed Country Park north of Teversham, the Wicken Fen corridor and Coldham's Common corridor, as well as the National Cycle Network routes 11 and 51.

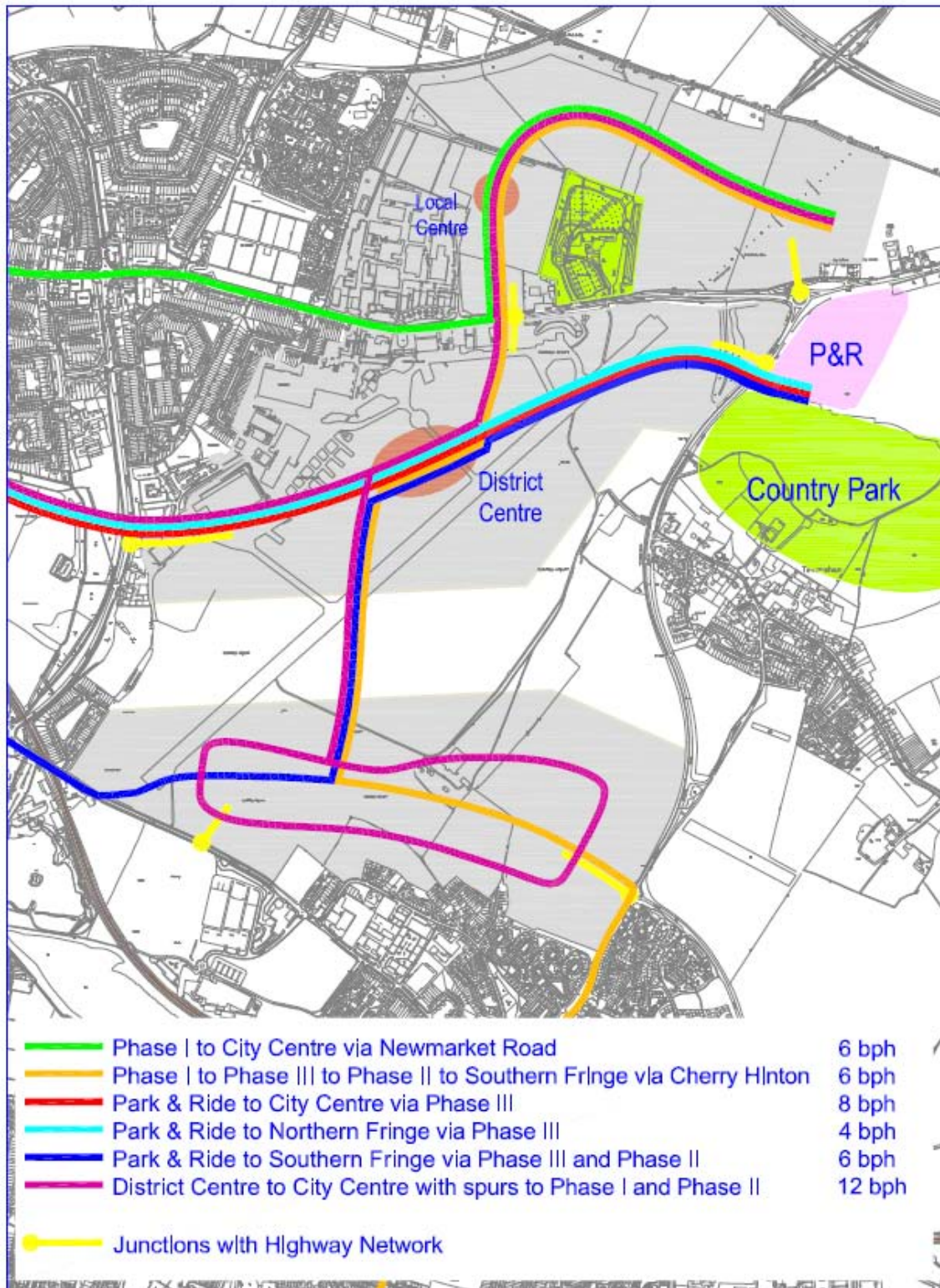
General Traffic

- 3.10 In Figure 3.1 we illustrate approximate locations for general traffic access into the development. In the case of access from Phase I to Newmarket Road, Phase II to Airport Way and Phase III to Airport Way, Newmarket Road and Barnwell Road, we consider that junctions will have to be shared with the public transport routes due to the need to minimise the number of junctions onto the surrounding roads for capacity

and safety reasons. However, these junctions should be designed in order to allow bus priority through bus lanes and signal prioritisation.

- 3.11 It is not envisaged that general traffic would be able to cross between Phases II (north of Cherry Hinton) and Phase III (Airport Site) without exiting the development onto one of the surrounding roads (Airport Way or Barnwell's Road) and then re-entering the development. This connection would be bus, walk and cycle only.

FIGURE 3.1 AN ILLUSTRATION OF THE INTERNAL NETWORK OF PUBLIC TRANSPORT ROUTES FOR CAMBRIDGE EAST



Phasing

3.12 The Area Action Plan identifies that the development of Cambridge East will occur in three distinct sectors, delivered over different timescales, North of Newmarket Road (Phase I), North of Cherry Hinton (Phase II) and the main airport site (Phase III). Extensions to Phases I and II will occur once the airport has been decommissioned and Phase III is underway.

3.13 Table 3.1 below provides an illustration of how 11,500 dwellings may be delivered.

TABLE 3.2 ANTICIPATED PHASING OF HOUSING IN CAMBRIDGE EAST

	By 2011	By 2016	By 2021	After 2021	Total
Phase I: North of Newmarket Rd	850	900			1,750
Phase Ib: North of Newmarket Rd.			1,750		1,750
Phase II: North of Cherry Hinton	250	1,200			1,450
Phase IIb: North of Cherry Hinton			1,150		1,150
Phase III: Main Airport Site			2,700	2,700	5,400
<i>Total</i>	1,100	2,100	5,600	2,700	11,500

3.14 The phasing of the development and the size of the different development components throws up some challenges for the implementation of the Cambridge East sustainable transport strategy.

3.15 Most fundamentally, Cambridge East will be built ‘from the outside in’, with the main District Centre being at the heart of the Phase III development, which comes on-stream in the later stages of the development due to this sector being reliant on the airport decommissioning.

3.16 This also means that the construction of transport links that rely on this part of the development will have to be developed at later stages. This specifically affects any link from Phase II (Cherry Hinton) northwards, towards Phase I or onto the proposed Coldham’s Common link towards the City Centre / Northern Fringe.

Transport requirements for Phase I

3.17 For the initial development of Phase I, (1,750 households to 2016), we now make recommendations on transport improvements that should be implemented alongside this first phase. This first phase will not justify the full implementation of all the transport measures proposed above and, as such, it is unlikely that the first phase development will achieve the 60% non-car modal share anticipated for the overall development once fully delivered.

Bus services

- City centre: either support for a dedicated service to link the development and the City Centre via Newmarket Road, or extension of the existing Park & Ride

service to provide a simple loop around the development. The planning conditions will specify quality of vehicle / service and an adequate capacity / frequency to be provided from the inception of the development (if a Park & Ride extension is chosen, this will require an increase in Park & Ride service capacity).

- Southern Fringe: none (travel via City Centre)
- Northern Fringe: none (travel via City Centre).

Bus infrastructure

- Newmarket Road: modest improvements to bus priorities on the eastern section of Newmarket Road (between Abbey Stadium and the site access), including in-bound priority and junction enhancements at Barnwell Road junction;
- Within the site: new junction between the existing car showrooms and Park & Ride site and traffic management to provide unhindered access on-road through site, looping back to Park & Ride site. New bus gate and minor layout changes to Park & Ride to allow the bus back into the Park & Ride car park from the north and through to the current terminus;
- Technology: provision of real time information (RTI) at Park & Ride site and at bus stops within site and on service along Newmarket Road. Fitting of buses with RTI equipment;
- Relocation of the Park & Ride site to the new site east of Airport Way: this should be required of Phase I of the development, but implemented towards the end of this Phase, when the existing Park & Ride site is to be turned over to an urban park. Ideally, this would be the point at which the Park & Ride service could run via its segregated route through Phase III of the development. The Phase I should be sufficiently large and have enjoyed a sufficiently high standard of public transport provision over a number of years that a high frequency dedicated service to the City Centre can be commercially provided;
- Initial works on infrastructure for services towards Southern Fringe: depending upon the option selected, it could be appropriate to initiate infrastructure measures for the link to the Southern Fringe so that this service can come on-stream at the earliest opportunity in Phase II.

Cycling infrastructure:

- City centre: Upgrading of Jubilee Route to City Centre, as specified in Section 2;
- Northern Fringe: Provision of new route to Northern Fringe via Jubilee Route and new bridge crossing over River Cam (as specified in Section 2);
- Southern Fringe: no proposals (option of using existing cycle routes via Airport Way or Outer Ring Road);
- Provision of connection onto long distance cycle network NCN route 51 towards Newmarket and onto leisure route towards Wicken Fen (see Section 2).

Highways infrastructure:

- Access to A14:
 - If the Quy Interchange and Newmarket Road dualling is preferred, given current capacity constraints here, it would be appropriate to implement this scheme.
 - If the Fen Ditton link road is preferred, there will not be sufficient traffic volumes at this stage to justify its construction and it would seem excessive

to make intermediate improvements to Quy interchange / the Newmarket Road approach to Quy. However, if the Highways Agency considered that the development was having an impact on an already capacity-constrained junction, it could require junction enhancements to be made.

- Traffic calming measures in Fen Ditton to ensure that excessive traffic is discouraged from routing through the village to join the A14 at the Fen Ditton junction should be initiated.
- Local Access:
 - Provision of general traffic junction between the existing car showrooms and Park & Ride site. This junction to be built with sufficient capacity for full site occupation and to provide segregated bus and cycle access from the development onto Newmarket Road and to allow, at a future point, segregated bus and cycle access across the junction into the Phase III Airport site. (This could, for example, be accomplished via a large signalised roundabout providing bus and cycle access across the roundabout);
 - Provision of general traffic distributor road connecting to Airport Way/Newmarket Road roundabout and modifications to this roundabout to accommodate it.

Other transport requirements

- Development and implementation of a Residential Travel Plan, as outlined in Section 2 above;
- Support to further works to enhance bus capacity and cycling capacity in the City Centre and at other key destinations.

Transport requirements for Phases II and III

3.18 It is anticipated that work on Phase II (North of Cherry Hinton) will commence in advance of the airport being decommissioned. This sector of the development is the most problematic to connect into the proposed transport network in advance of Phase III being developed. From a transport perspective, we therefore recommend that, if possible, Phase II should not be started before it is possible to provide transport links northwards towards Phase III. At the very least, planning permission for this sector should be made conditional on Phase III being fully developed. Otherwise there is a risk of having a moderate sized development in a part of the network that cannot be adequately served by quality public transport services and is likely to generate large numbers of car trips onto a constrained and inappropriate part of the transport network.

3.19 In the event that work on Phase II begins before transport links can be made northwards to join the proposed links to the City Centre and Northern Fringe, we recommend that the infrastructure for the bus link to the Southern Fringe is required, including provision of bus priority on the section of Coldham's Lane between Barnwell Drive and the western edge of the development and that, in the absence of some of the public transport infrastructure, temporary bus services are required to be provided towards the City Centre and Southern Fringe. We also recommend that the off-road cycling route to the Southern Fringe via Cherry Hinton Hall is required and the routes to the City Centre via Tin's Path and via Coldham's Common are provided. The two proposed local road junctions from this sector of the development onto Coldham's Lane and Airport Way should also be implemented.

- 3.20 Once Phase III is initiated, the remaining parts of the transport infrastructure can be implemented, including:
- The segregated bus route towards the City Centre (and potentially towards the Northern Fringe), (including the segregation at the western end if this is not provided as part of a wider strategy).
 - The bus, walk and cycle connection across the ‘green wedge’ between Phases II and III, enabling bus services to provide north-south routes through the entire development.
 - Remaining road junctions to access the site;
 - The Fen Ditton Link Road or Quy Interchange / Newmarket Road upgrade.

Public Transport Access to Northern Fringe

- 3.21 We have proposed a major new segregated High Quality Public Transport Link to Chesterton and beyond. As well as providing access between Cambridge East and employment/population in the north of Cambridge, it could assist with the development of an orbital public transport service linking all the developments around the north of station, provide access to the proposed Chesterton Station and provide a fully segregated link for Cambridgeshire Guided Bus to access the City Centre.
- 3.22 This proposal is not likely to be financially viable on the basis solely of trip demands from Cambridge East to the Northern Fringe. However, the opportunity to encourage sustainable travel to/from Cambridge East will be greatly enhanced the sooner this link can be provided. Therefore, it is recommended that, dependent upon the outcomes of other studies to examine the options for a northern orbital bus service, this link should be progressed as soon as possible, together with the associated works at the west end of Newmarket Road

Supportive policy and planning context

Transport policy

- 3.23 The broader policy context of the Long Term Transport Strategy, Local Transport Plan, Structure and Local Plans is provided in *Technical Note A: Background and Context*.
- 3.24 These show policy support for locating growth in the sub-region within the City of Cambridge, where employment growth is occurring and housing demand is greatest. The transport impact (in terms of overall mileage and car-reliance) is potentially a lot lower than if growth were directed to surrounding or new settlements.
- 3.25 But for a sustainable urban extension to be realised, it is essential that detailed planning policies for the development itself support these objectives.
- 3.26 The Cambridge East Area Action Plan develops planning principles and policies for the development of Cambridge East and contains many well established principles in development planning to promote sustainable travel modes and choices, namely:
- Mixed use development: provision of both jobs and housing within Cambridge East;

- Community facilities: the provision of a comprehensive suite of community facilities to meet the needs of a development of this scale, including primary schools, a secondary school, a District Centre, local neighbourhood centres and other community facilities, such as leisure and recreation, library facilities etc.;
- High density development, with a commitment to a net overall density of 50 dwellings per hectare or above.

3.27 In Section 2, we proposed that a Smarter Choices package should be implemented to complement the physical transport measures and that this should be done under the auspices of a comprehensive Residential Travel Plan for Cambridge East.

3.28 An additional part of this Residential Travel Plan is to assist in the detailed design of Cambridge East at later planning stages to ensure that the planning and site design maximises the potential for sustainable modes. Particular issues that would be addressed include:

- Ensuring the internal network of routes proposed in a site layout enables unhindered / preferential public transport access within the development;
- Ensuring that the internal network of routes provides the quality of cycling and walking facilities identified earlier;
- Ensuring that speed restraint and inappropriate parking are designed out in the design stage, possibly including the designation of home zones or 20mph speed limits within the development;
- Ensuring appropriate car parking standards and policies are devised and implemented. Draft Planning Policy Statement 3 (para.20) states that “Local planning authorities should develop parking policies for their plan area with local stakeholders and local communities having regard to expected car ownership for planned housing in different locations, the efficient use of land and the importance of promoting good design”. For Cambridge East to meet its sustainable travel targets, it is essential that the car usage is not the mode of choice for all trips. In addition, for the development to achieve its density targets and good design, large expanses of surface level parking or on-street parking need to be resisted. Therefore, bearing in mind the guidance from PPS3, it is important that facilities for the private car are not over-provided. Advice from the Car Club industry is that car clubs flourish best in areas with less than 0.8 car spaces per dwelling. Across a development of this size, it is likely that a range of densities and types of housing will be provided. While planning for 2-cars per household may be appropriate for some of the housing market, there may be other parts of the development where 1 car per dwelling is catered for, as well as planning an element of car-free housing. It could also be appropriate to consider having higher density parts of the development where no surface car parking is provided, with parking provided below buildings. This would complement the objective of creating a bold and high quality urban design.

4. CONCLUSIONS

Justification

- 4.1 Cambridge East not only requires major investment in sustainable transport in order to ensure its transport impact is manageable and the site can be fully developed, but it also represents an opportunity to enhance Cambridge's sustainable transport network for future generations.
- 4.2 It is going to have to be positively marketed as a sustainable development. Locally, these transport proposals imply some negative environmental and amenity impacts, but by pursuing these schemes, it is possible to achieve the ambitious non-car mode share set for Cambridge East and hence allow a development that will bring many broader benefits to Cambridge.
- 4.3 As described in *Technical Note C: Demand Assessment*, emerging proposals have been tested by Atkins through the Cambridge Sub-Regional Land Use and Transport Model, with the following headline results (Table 4.1).

TABLE 4.1 HEADLINE RESULTS OF MODEL RUNS FOR CAMBRIDGE EAST

Model Scenario	Car	Pub Transport	Walk/Cycle
LTTS Base Case	45%	23%	32%
LTTS + Proposed Camb E PT measures	41%	27%	32%
LTTS + Proposed Camb E PT measures + DM	34%	31%	35%

- 4.4 It shows that the major proposals for high quality public transport and cycling provision enable a significantly improved modal split, compared to the base case. This is particularly pronounced under a demand management scenario.
- 4.5 Hence the strategy succeeds in its core objective of delivering a 60% non-car modal split. The benefits of this include:
- The strategy supports the overarching vision for a 21st century sustainable urban extension and ensures that the traffic impact on the surrounding network is minimised;
 - It provides a stepchange in the quality of public transport and provides the opportunity to develop a High Quality Public Transport Network across Cambridge;
 - It provides a stepchange in the quality of walking and cycling facilities, within the development and on the surrounding network for the benefit of Cambridge residents;
 - 3,404 public transport trips per peak hour (31% mode share) are generated;
 - 3,934 cycling/walking trips per peak hour (35% mode share) are generated;
 - 1,100 less car trips are exported onto the surrounding network in the morning peak hour compared to the base case;
 - A package of transport measures that allows Cambridge East to be fully developed resists the need for alternative sites further away from the Cambridge

urban area to be developed. These sites would inevitably be significantly more car dependent and generate significantly more car traffic.

4.6 However, to achieve these results requires the implementation of a comprehensive smarter choices package and implementation of the development along the lines proposed in the Area Action Plan (in terms of build densities and community facilities).

4.7 The implementation of a demand management scheme would also have a positive reinforcing impact and help to achieve an even greater non-car modal share.

Further technical work

4.8 The strategy seeks to establish general principles and specific preferred options for public transport and cycling infrastructure and services.

4.9 However, the Strategy will need to be further developed as the Area Action Plan for Cambridge East develops and in response to significant developments in transport policy:

- Future of demand management: a demand management regime has the potential to provide further assistance to meeting the non-car modal share targets set. If a demand management scheme does come forward, the Cambridge East Sustainable Transport Strategy should be revisited to assess how it can further benefit from this;
- Future of Southern Orbital Route: there has also been consideration of the potential for a Southern Orbital Route to enable traffic travelling from north of Cambridge to south of Cambridge to avoid the outer ring road and Cherry Hinton. Again, if a proposal came forward, this could have a significant impact on opportunities and requirements for public transport and cycling links to the Southern Fringe, enabling a high quality public transport scheme on The Outer Ring Road to be implemented with a lesser impact on that road and potentially allowing Cherry Hinton and local routes towards the city to be de-trafficked;
- Further development of Cambridgeshire Guided Bus: specifically the opportunity to implement the missing link between Newmarket Road and the railway station, which would provide a continuous segregated route from Cambridge Northern Fringe to Cambridge Southern Fringe and enable a full network to be developed;
- Traffic modelling of highways links to test extent of bus priority measures required on Outer Ring Road and Newmarket Road;
- In-bound assessment of Cambridge East (with updated modelling), particularly to assess the potential two-way demand for a Northern Orbital public transport route.

4.10 Currently, transport models are being developed and updated in relation to the further development of the Long Term Transport Strategy and the Transport Innovation Fund bid. Once these models are in place, it will be helpful to test the Cambridge East Strategy again to ensure it is robust. Specifically we recommend:

- Testing of the preferred strategy in the updated Land Use and Transport Model when it is updated to a 2001 census base;
- Specific proposals are tested on new micro-simulation models of Newmarket

Road to understand whether an on-road solution can work / the relative benefits of total segregation. If micro-simulation modelling is available for the Outer Ring Road, performing the same tests on a bus route along here to the Southern Fringe.

4.11 The future planning of Cambridge East also needs to address some broader, network-wide issues:

- How proposals for Cambridge East can complement, or be complemented by other developments around Cambridge. For example, the case for a Northern Orbital bus route, solely to link Cambridge East to the Northern Fringe appears to be marginal, but if a new station is developed at Chesterton and the Cambridge Northern Fringe East site developed, the viability of a northern orbital bus route may be significantly enhanced. Cambridgeshire County Council is currently commissioning some further work (The Cambridge Area Transport Study) to look at the implications of development around Cambridge;
- Bus capacity in the City Centre: currently capacity is restricted and proposals for service enhancements from this and other developments infer increased bus services going into the City Centre. Again, the Cambridge Area Transport Study being commissioned by Cambridgeshire County Council will address this;
- Provision of cycle parking at key destinations, such as City Centre, Addenbrooke's etc.: this could be a major limiting factor on the levels of usage anticipated for Cambridge East, and is another issue being picked up in the Cambridge Area Transport Study.

Consultation on Cambridge East

4.12 As the planning process on Cambridge East moves forwards, it will be necessary to consult the public on the development. The transport implications of the development have the potential to attract considerable opposition as they imply some environmental and amenity impacts. It is therefore vital that the transport requirements of Cambridge East are presented as part of an holistic consultation on Cambridge East, where the benefits of the development (in terms of supporting economic growth in the sub-region, providing affordable housing and new community facilities) can be presented.

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