

CAMBRIDGE EASTERN ACCESS TRANSPORT STUDY OPTIONS APPRAISAL REPORT





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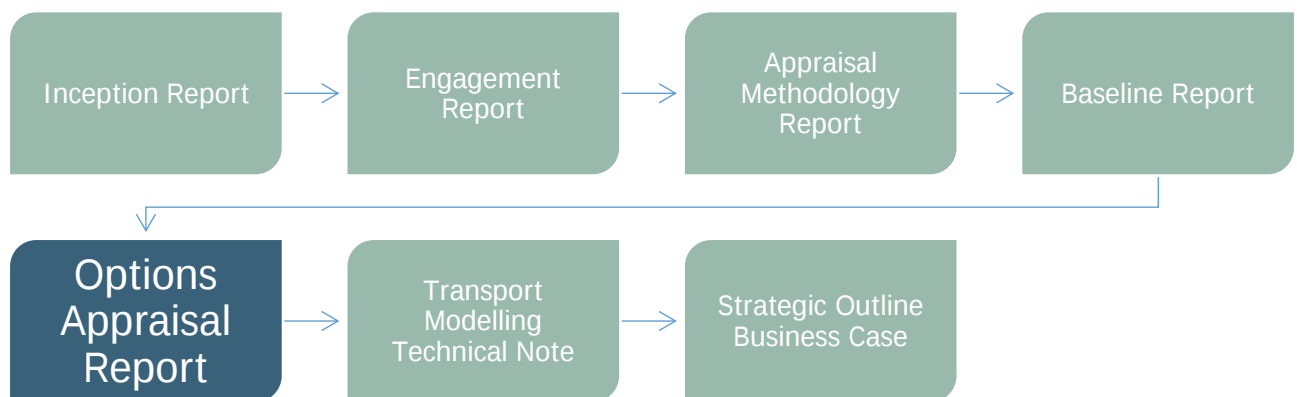
1 | Background

1.0 Background

1.1 Overview

- 1.1.1 This document forms the Options Appraisal Report (OAR) for the Cambridge Eastern Access Study. It details the need for investment in public transport improvements and supporting active travel measures in the east of the city, the areas of intervention through which this need could be addressed, the process through which these options have been evaluated and the outputs of the assessment of alternative packages of investment.
- 1.1.2 The OAR forms one of a suite of documents which together comprise the Cambridge Eastern Access Study (see [Figure 1.1](#)). It builds upon the findings and recommendations of the Baseline Report which should be read in conjunction with this report and aligns with similar studies commissioned by the Greater Cambridge Partnership (GCP) across the city on corridors to Cambourne, Haverhill and Waterbeach

Figure 1.1: Cambridge Eastern Access Study Documents



1.2 Objectives

- 1.2.1 The study has been undertaken to identify measures to address existing shortcomings in sustainable transport provision in the east of the city and capitalise upon extensive opportunities for housing and jobs growth. In this context, three clear objectives were identified at the conclusion of the Baseline Report to provide a structure and framework to help shape the option identification and appraisal process. These objectives are as follows:
- **Capacity** – Provide the public transport capacity to accommodate the projected increase in travel demand associated with housing and employment growth, prior to the opening of the Cambridgeshire Autonomous Metro.
 - **Connectivity** – Improve accessibility to jobs and opportunities by public transport and active travel modes through a reduction in journey times in the short to medium term.
 - **Communities** – Contribute towards the creation of safe and attractive communities by reducing emissions, the divisive impact of major roads through residential areas and the dominance of traffic.
- 1.2.2 Together it is felt that these objectives reflect the current and future requirements of transport provision along Newmarket Road and more broadly across the east of the city, with supporting criteria through which to measure the respective contribution of future scheme option.

1.3 Study Area

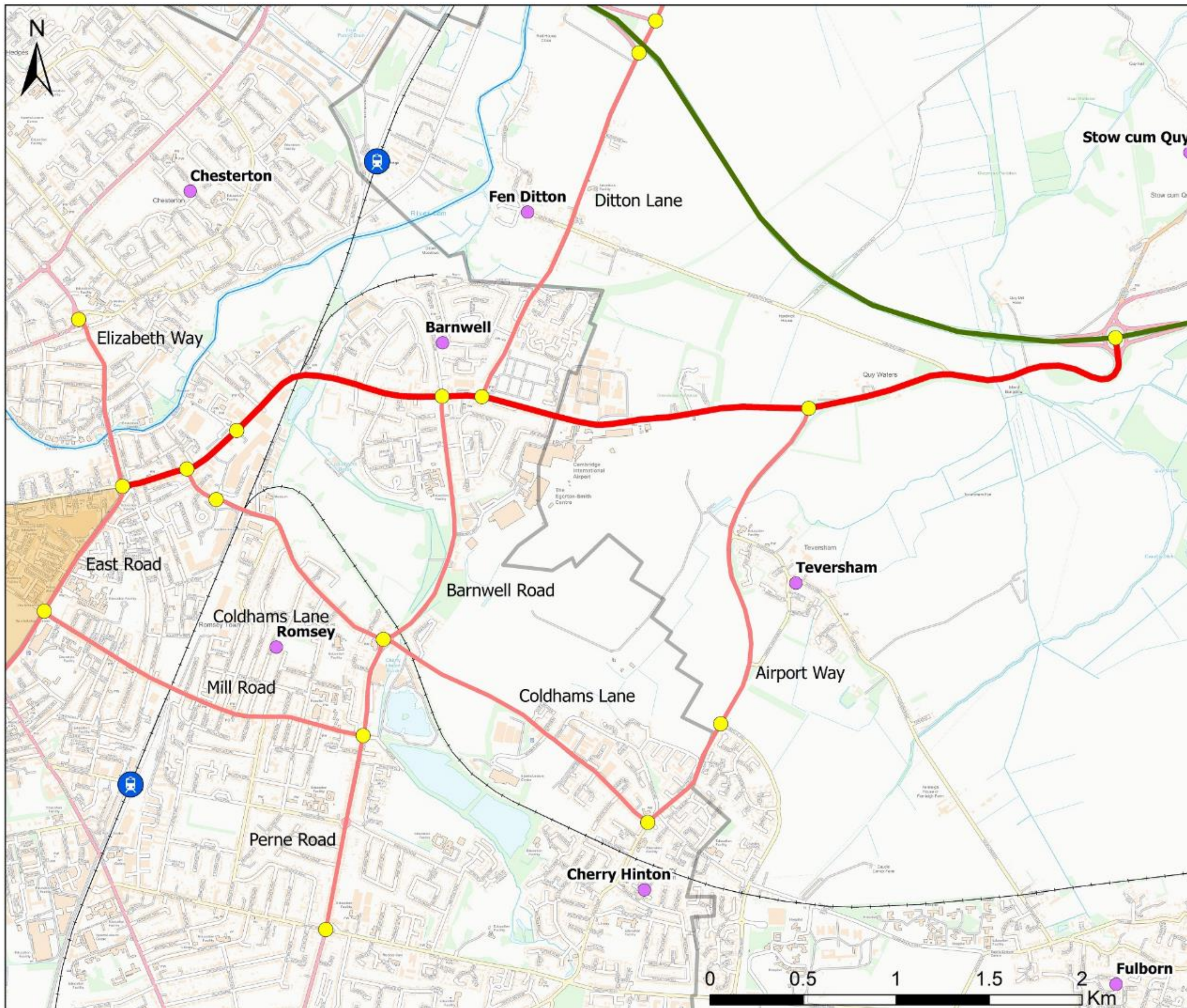
- 1.3.1 The study broadly covers the Newmarket Road corridor and the surrounding area, from Mill Road and Coldham's Lane in the south to the A14 and Ditton Lane in the north, and from the Quay Interchange on the A14 in the east to the Elizabeth Way roundabout in the west.
- 1.3.2 The area is subject to high volumes of traffic and is the location for significant growth proposals which could see the expansion of the city to the east with the redevelopment of the airport site. In the longer term it is anticipated that the Cambridgeshire Autonomous Metro will serve the area via a route extending to Mildenhall.
- 1.3.3 The corridor forms the main gateway into the city from the east, and whilst it accommodates many east-west movements into and out of the city centre, it also forms an important leg for strategic trips between the north and south of the city, particularly for those wishing to access employment opportunities within the science park to the north and at the Biomedical Campus to the south.
- 1.3.4 The mix of land uses along Newmarket Road ensures that it remains busy throughout the day and Abbey Stadium, home of Cambridge United Football Club, represents a significant trip generator and destination on match days throughout the football season. A map of the study area is provided in [Figure 1.2](#).

1.4 Policy Context

- 1.4.1 The Cambridgeshire and Peterborough Local Transport Plan (LTP) provides the long-term vision and strategic framework for investment in shaping the travel choices and the role of transport in the years to come. This study aligns with the high-level goals of the LTP in seeking to:
- Economy: Deliver economic growth and opportunity for all our communities.
 - Society: Provide an accessible transport system to ensure everyone can thrive and be healthy.
 - Environment: Protect and enhance our environment and tackle climate change together.
- 1.4.2 The study has also sought to identify solutions to address current issues within the Newmarket Road corridor and through which to provide a step-change in the look and feel of the transport offer, and provide the capacity and connectivity to facilitate sustainable growth, echoing the thrust of the overarching vision of the LTP.
- 1.4.3 In terms of growth, the emerging Greater Cambridge Local Plan will detail the scale, nature and location for housing and employment provision to come forward. Whilst the study could not be informed by the decisions on these allocations, it was progressed in a way which will embed flexibility in the options taken forward, future proofing the findings of the study to the Local Plan approval process.
- 1.4.4 At a local level, the study has also been developed to support the aspirations of the East Barnwell Regeneration Study, and at a more strategic level, address the salient points of the Cambridgeshire and Peterborough Independent Economic Review.

1.5 Alignment with Other Transport Studies

- 1.5.1 The study is one of a series of projects through which the Greater Cambridge Partnership is seeking to better understand the need, shape and future direction of transport investment across the city. It has sought to reflect and complement interventions identified by the GCP through other corridor studies and align with more strategic assessments and initiatives being led by a variety of partners within the sub-region and beyond, as illustrated in [Figure 1.3](#).
- 1.5.2 Furthermore, the Cambridgeshire and Peterborough Independent Economic Review (CPIER) commissioned and funded by Cambridgeshire and Peterborough Combined Authority in 2017, suggested that the level of investment in transport infrastructure has been inadequate for too long. The report suggests that unless urgently addressed, inadequate transport could become a hindrance to growth. Intelligently planned transport links are required to avoid worsening of congestion.
- 1.5.3 The study investigates how this can be addressed in the east of the city.



Legend

- A14
- Newmarket Road
- Other Eastern Distributor
- Major Junction
- Railway Station
- Railway Line
- River Cam
- Cambridge City Centre
- Settlement / Residential Area
- Cambridge City Boundary

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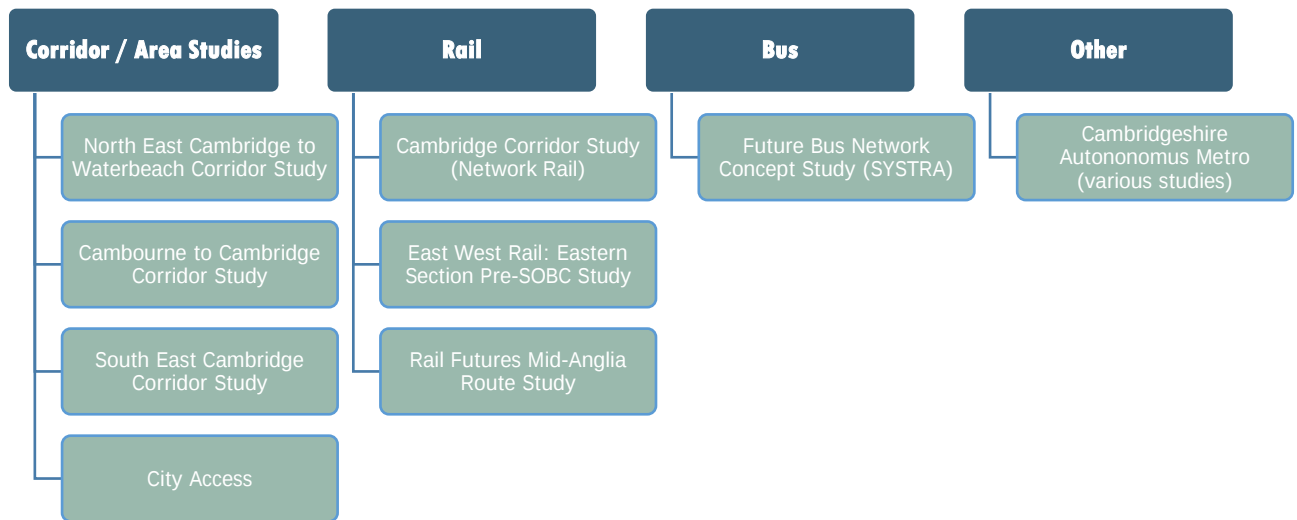


Figure 1.2: Study Area

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Figure 1.3: Alignment with Other Studies



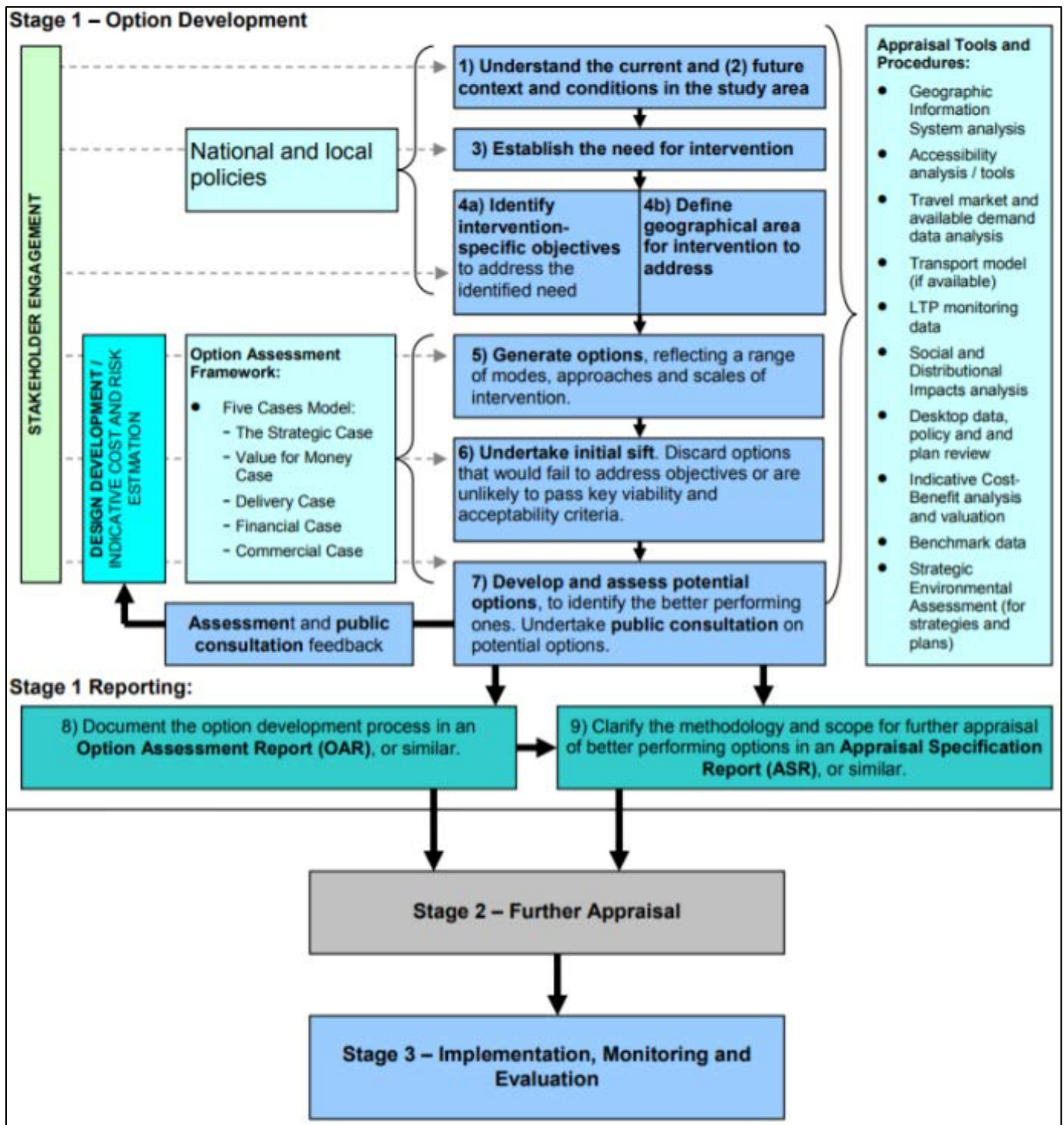
1.6 Guidance on the Appraisal Process

- 1.6.1 This OAR follows the guidance provided by the Department for Transport (DfT) entitled 'The Transport Appraisal Process', which details the process to be undertaken in the appraisal of transport interventions¹.
- 1.6.2 The Report is structured to adhere to this and highlight the necessary steps which have been undertaken from the initial understanding of issues and option development, through to the detailed appraisal that supports the preparation of a business case, to subsequent approval stages and post implementation evaluation.
- 1.6.3 The three stages in the DfT's transport appraisal process are illustrated in [Figure 1.4](#) and comprise:
- **Stage 1 – Option Development.** This involves identifying the need for intervention and developing options to address a clear set of locally developed objectives which express desired outcomes. These options are then sifted for the better performing options to be taken on to further detailed appraisal in Stage 2.
 - **Stage 2 – Further Appraisal.** Requires the assessment of a small number of better performing options in order to obtain sufficient information to enable decision makers to make rational and auditable decisions about whether or not to proceed with an intervention. The focus of analysis is on estimating the likely performance and impact of intervention(s) in sufficient detail.
 - **Stage 3 – Implementation, Monitoring and Evaluation.** Focuses on the identification of indicators to verify whether implementation is 'on track', and to what extent the intervention is achieving its intended objectives.
- 1.6.4 This OAR covers Stage 1 and Stage 2 of the DfT's process and will inform the development of a Strategic Outline Business Case (SOBC). In turn it is consistent with Green Book guidance, the basis upon which Central Government develop transparent, objective, evidence-based appraisal and evaluation of proposals to inform decision making².

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/712965/webtag-transport-appraisal-process-may-2018.pdf

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

Figure 1.4: The Transport Appraisal Process



1.7 Structure of the Report

1.7.1 The OAR provides a step by step overview of the process through which ideas and options have been identified and considered to address current sustainable transport requirements on Newmarket Road and in the broader eastern access corridor, together with catering for future need in the period up until 2036. The Report is structured around the following chapters.

- **Chapter 2 | The Need for Intervention** – Summarises the findings of the Baseline Report which makes the case for investment in Newmarket Road, detailing the current and future issues expected to be experienced by road users in the corridor.
- **Chapter 3 | The Long List** – Sets out the Long List of schemes considered to provide potential mitigations to the issues on the corridor, providing an overview of each area of intervention and location plans highlighting each individual option.
- **Chapter 4 | Sifting of the Long List** – Details the sifting framework upon which the Long List of schemes has been assessed and the outcomes of this process, concluding with the identification of a Short List of schemes to be considered within packages to be considered in more detail within the transport model.
- **Chapter 5 | Packaging of the Options** – Presents the alternative packages of schemes and approaches through which to meet the objectives for the study, and the rationale behind the scenarios.
- **Chapter 6 | Next Steps** – Sets out the next steps in the progression of the study and taking the options forward to develop a Strategic Outline Business Case.

1.8 More Information

1.8.1 If more information is required, please contact the Greater Cambridge Partnership, via:

Telephone: 01223 699906

Email: contactus@greatercambridge.org.uk



2 | The Need for Intervention

2.0 The Need for Intervention

2.1 Overview

- 2.1.1 This section summarises the need for intervention and investment in sustainable transport on Newmarket Road and across the wider network, to improve both access into Cambridge City Centre from the east, and other orbital movements which avoid the city centre. It highlights the key findings of the Baseline Report³ in terms of the current and future pressures the corridor is anticipated to face in the coming years.

2.2 Current Provision

- 2.2.1 Newmarket Road is around 5.5km in length and connects the city centre from the Elizabeth Way roundabout to the A14 at the Quays Interchange (J35). The nature of the corridor changes as it heads from east to west, evolving from a fast, rural road dominated by the car, to an urban thoroughfare accommodating a mix of road users serving a mixture of residential areas, retail parks and businesses, albeit still heavily trafficked.
- 2.2.2 The quality of travel choices differs both by mode and location along the corridor and on the wider network:
- **General Traffic** – The Newmarket Road corridor is predominantly a single carriageway highway, characterised by several major at-grade junctions with important north-south routes such as Airport Way, Ditton Lane, Barnwell Road and Coldham's Lane. It is also punctuated by many smaller, signalised junctions, particularly between the Elizabeth Way roundabout and the Leper Chapel, providing access to the retail park and residential areas. The route provides access onto the A14 at both J34 (via Ditton Lane) and J35, emphasising its strategic importance to the city as a whole.
 - **Buses** – Buses predominately operated by Stagecoach run relatively frequently along the corridor, including the Newmarket Road Park & Ride service. The service provision is supported by around 1km of inbound bus lane and several junctions with bus priority, whilst there is some 400m of bus lane catering for outbound trips.
 - **Park and Ride** – The Park and Ride site accommodates around 850 spaces with real time information provided along the corridor. The quality of the waiting facilities (away from the Park and Ride site) is however, poor. Where shelters are provided, they are often in a poor state of repair.
 - **Cyclists** – Cycle provision along Newmarket Road is variable with some sections of on-road cycle lanes and some shared use paths. The lack of provision at the major junctions and volume of general traffic however makes it an unattractive route for many, with alternative parallel routes more attractive options.
 - **Pedestrians** – Whilst footpaths are in place along both sides of the majority of Newmarket Road, in several prominent locations there are no dedicated crossing facilities. The Elizabeth Way roundabout also provides a significant physical barrier between the corridor and the city centre, with pedestrians forced into unattractive, inconvenient and perceived unsafe subways to navigate the junction.
 - **Rail** – Access into Cambridge from the east is poor. The line to Newmarket is single track in places, with the lack of capacity this provides limiting the frequency with which trains can operate between these towns and the city. Cambridge Station itself is also extremely congested with regard to timetable scheduling and platform availability.
- 2.2.3 The overall picture is of a corridor that is busy for most of the day and throughout the week as a result of commuting, retail and visitor trips. However, it fails to balance the movement and place functions successful corridors of this nature are expected to perform – it is heavily trafficked, engineered towards the needs of the car, and lacks a sense of place and quality in the public realm.

³ Eastern Access Public Transport Study Baseline Report; WYG for the Greater Cambridge Partnership, February 2020

2.3 Current Practice – General Traffic

Volume of Traffic

- 2.3.1 Newmarket Road is a heavily trafficked corridor. In a typical morning peak hour (between 8am and 9am) over 1,500 vehicles head towards the city from the Quy Interchange (A14 J35), whilst in excess of 1,100 vehicles travel along the section between Coldham's Lane and the Elizabeth Way roundabout⁴. To put that in perspective, that is around 25 vehicles and 18 vehicles per minute respectively (see [Figure 2.1](#)).
- 2.3.2 In the evening peak hour (between 5pm and 6pm) the volume of traffic is even greater, with almost 1,300 vehicles per hour heading away from the city between Coldham's Lane and the Elizabeth Way roundabout and 1,500 vehicles approaching the Quy Interchange within a typical peak hour (see [Figure 2.2](#)).
- 2.3.3 Whilst the rest of Newmarket Road does not experience these volumes, the section between the Barnwell Road roundabout and Ditton Lane sees almost 1,200 vehicles in the evening peak hour. By comparison the section to the north of the airport accommodates around 850 outbound vehicles in the hour.
- 2.3.4 In the wider study area, the A14 is subject to the highest flows, with some 2,800 vehicles travelling east to west between J35 and J34 in the morning peak (equating to 47 vehicles per minute), and a similar number travelling in the opposite direction in the evening peak.
- 2.3.5 Elsewhere Coldham's Lane close to the retail park sees inbound (northbound) flows of around 600 vehicles in the morning peak and 750 vehicles travelling outbound (southbound) in the evening peak. Ditton Lane immediately north of Newmarket Road is also notable, with similar flows of around 600 vehicles heading in each direction northbound and southbound from the junction with Newmarket Road in the morning peak.
- 2.3.6 In the evening peak however, almost 800 vehicles head northbound towards the A14, with around 500 heading southbound towards Newmarket Road.

Journey Times

- 2.3.7 Journey times for general traffic are significantly impacted by queues and delays in the morning and evening peak periods, as illustrated in [Table 2.1](#).

Table 2.1: Journey Times for General Traffic along Newmarket Road in 2017

Time	Direction	Time
Am peak	Inbound (westbound)	13 mins 28 secs
Am peak	Outbound (eastbound)	9 mins 57 secs
Inter-peak	Inbound (westbound)	9 mins 21 secs
Inter-peak	Outbound (eastbound)	9 mins 32 secs
Pm peak	Inbound (westbound)	10 mins 27 secs
Pm peak	Outbound (eastbound)	11 mins 44 secs

Source: Cambridge Paramics Model

- 2.3.8 Delays materialise as a result of demand (vehicle flow) outstripping supply (capacity) on sections of the network. This is represented in [Figure 2.3](#) and [Figure 2.4](#) in terms of the respective levels of stress across the study area in the morning and evening peak periods. The key findings of this assessment demonstrate:

- In the morning peak period, inbound traffic on Newmarket Road can be delayed by around four minutes when compared to journey times outside of the peak periods. This is predominantly as a result of queuing on the approach to the Airport Way roundabout, the junction with Ditton Lane and in travelling through the junctions immediately adjacent to the retail park.

⁴ Cambridge Paramics Model, 2017 base year outputs

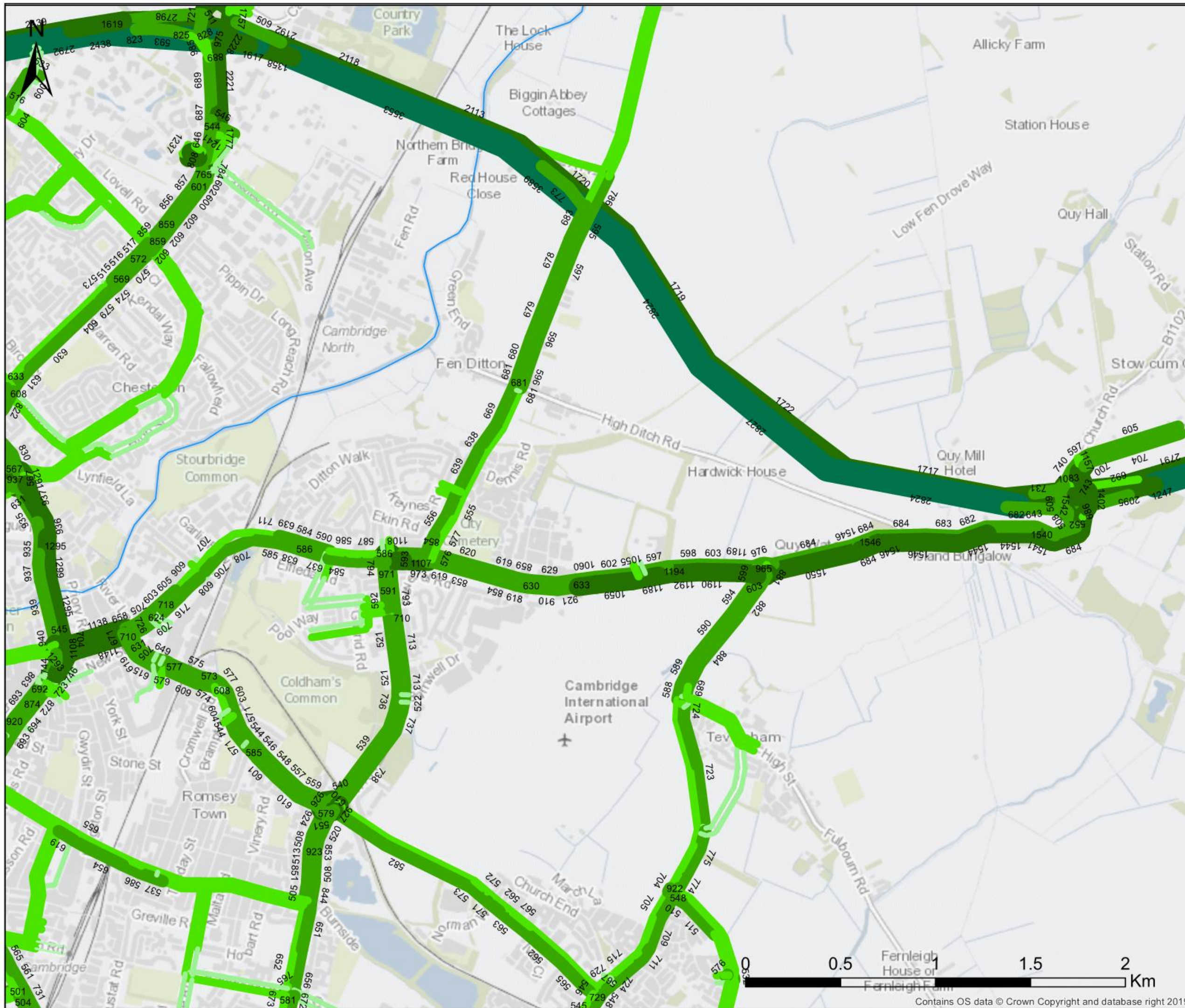


- In the evening peak period, outbound traffic on Newmarket Road can be delayed by around two minutes when compared to journey times outside of the peak periods. This is predominantly as a result of queuing on approaches to the A14 Quay Interchange (J35), the Airport Way roundabout and, as with the morning peak, associated with the junctions adjacent to Cambridge Retail Park.

2.3.9 Outside of the traditional peak periods during the working week, it is also recognised that congestion and delays occur when Cambridge United Football Club is playing home games at the Abbey Stadium on Newmarket Road, typically on a Saturday afternoon or Tuesday evening. This is typified by short, sharp peaks in the hour leading up to the game and around half an hour after its conclusion.

Routing

- 2.3.10 A more nuanced understanding of the operation of Newmarket Road is possible through a select link analysis of the corridor within the Cambridge Sub-Regional Transport Model, providing an understanding as to where corridor users start and finish their journeys.
- 2.3.11 [Figure 2.5](#) highlights how only a relatively small proportion of the vehicles which enter the corridor at the Quay Interchange on the A14, travel the complete length of Newmarket Road to the Elizabeth Way roundabout.
- 2.3.12 A large proportion of the vehicles head south down Airport Way, towards Addenbrooke's Hospital and the other employment opportunities to the south of the city, whilst it appears that the Park and Ride site has some success in intercepting vehicles before they head into the city from the east.
- 2.3.13 In terms of trips heading away from the city centre in the evening peak, Coldham's Lane carries around the same number of vehicles as Newmarket Road from those joining the corridor from the inner ring road (see [Figure 2.6](#)). Both links provide access to the retail parks however, which appear to account for a high proportion of all trips entering Newmarket Road from Elizabeth Way.
- 2.3.14 In this respect it may reflect that the evening peak congestion delays are not merely as a result of commuter trips, but generated by a trips associated with a variety of journey purposes.



Legend

Base 2017, Total Vehicle Flow (pcu) - AM Peak

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

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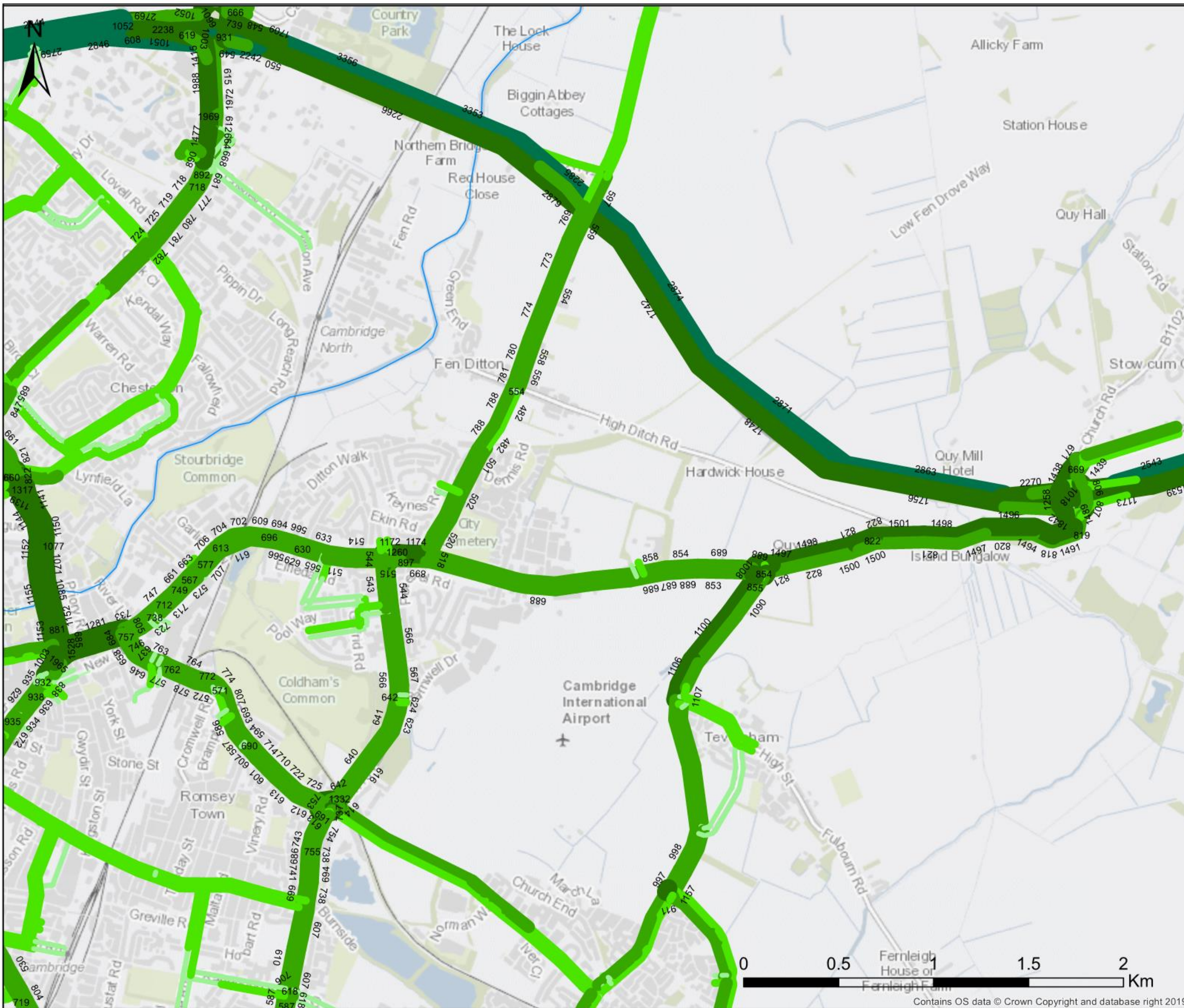
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Figure 2.1: Vehicle Flows in the AM Peak Hour

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Legend

**Base 2017, Total
Vehicle Flow
(pcu) - PM Peak**

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

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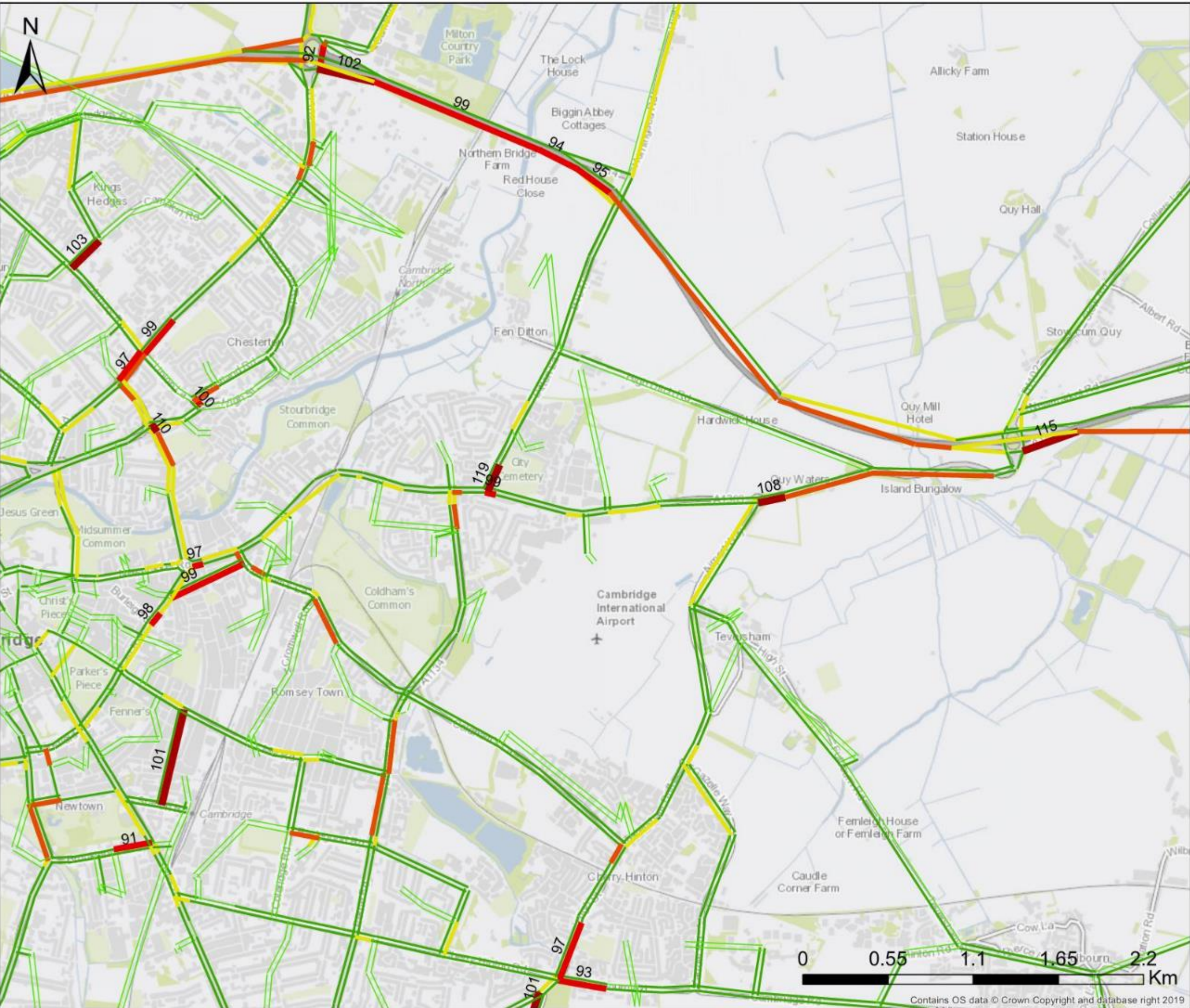
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Figure 2.2: Vehicle Flows in the PM Peak Hour

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Legend

AM Vehicle/Capacity Percentage

- 0 - 10
- 10 - 50
- 50 - 75
- 75 - 90
- 90 - 100
- 100 - 200

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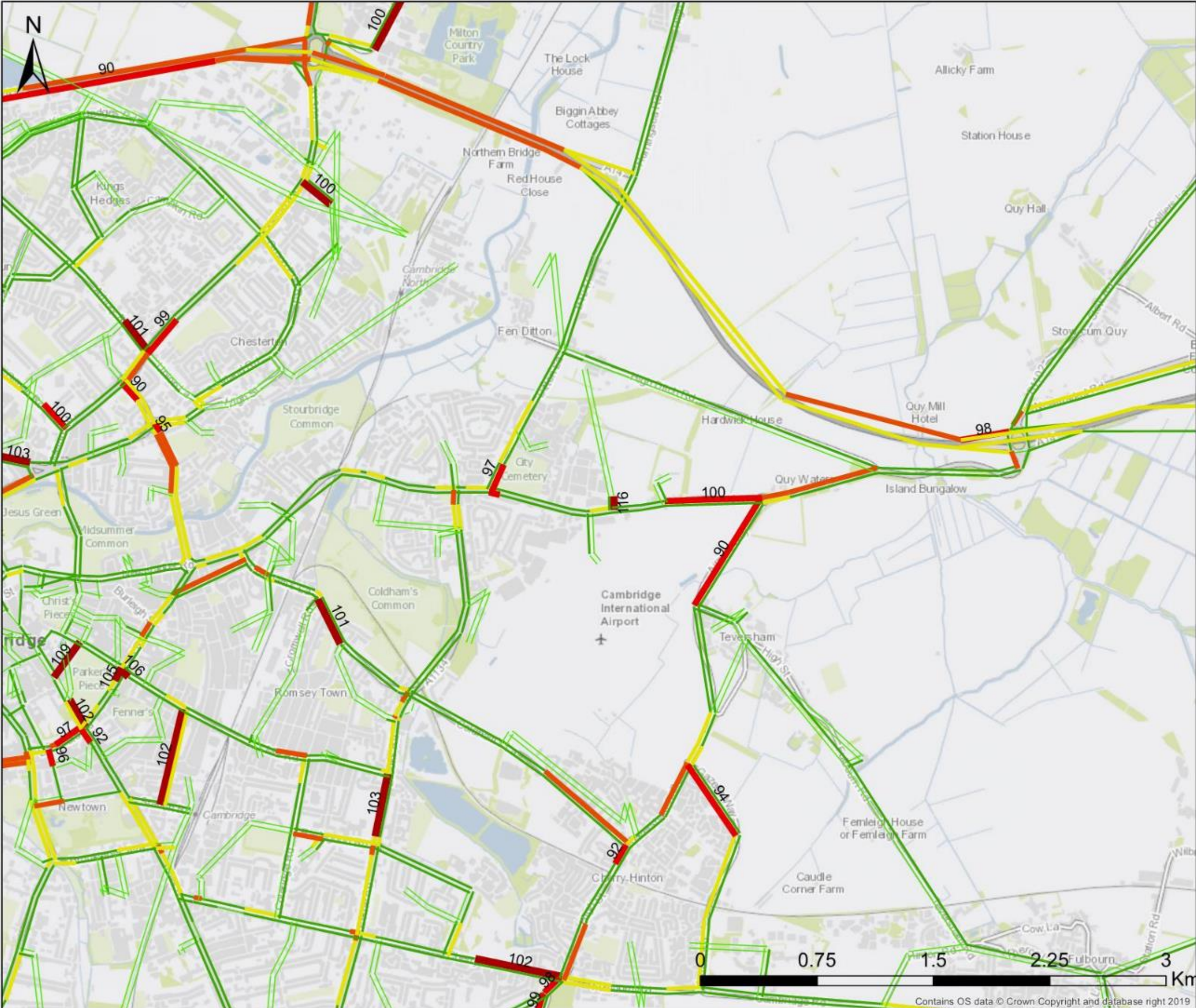
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Figure 2.3: Volume over Capacity in the AM Peak Hour

Scale @ A3 NTS	Drawn GD	Date 30/01/20	Checked LM	Date 30/01/20	Approved GD	Date 30/01/20
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PM Vehicle/Capacity Percentage

- 0 - 10
- 10 - 50
- 50 - 75
- 75 - 90
- 90 - 100
- 100 - 200

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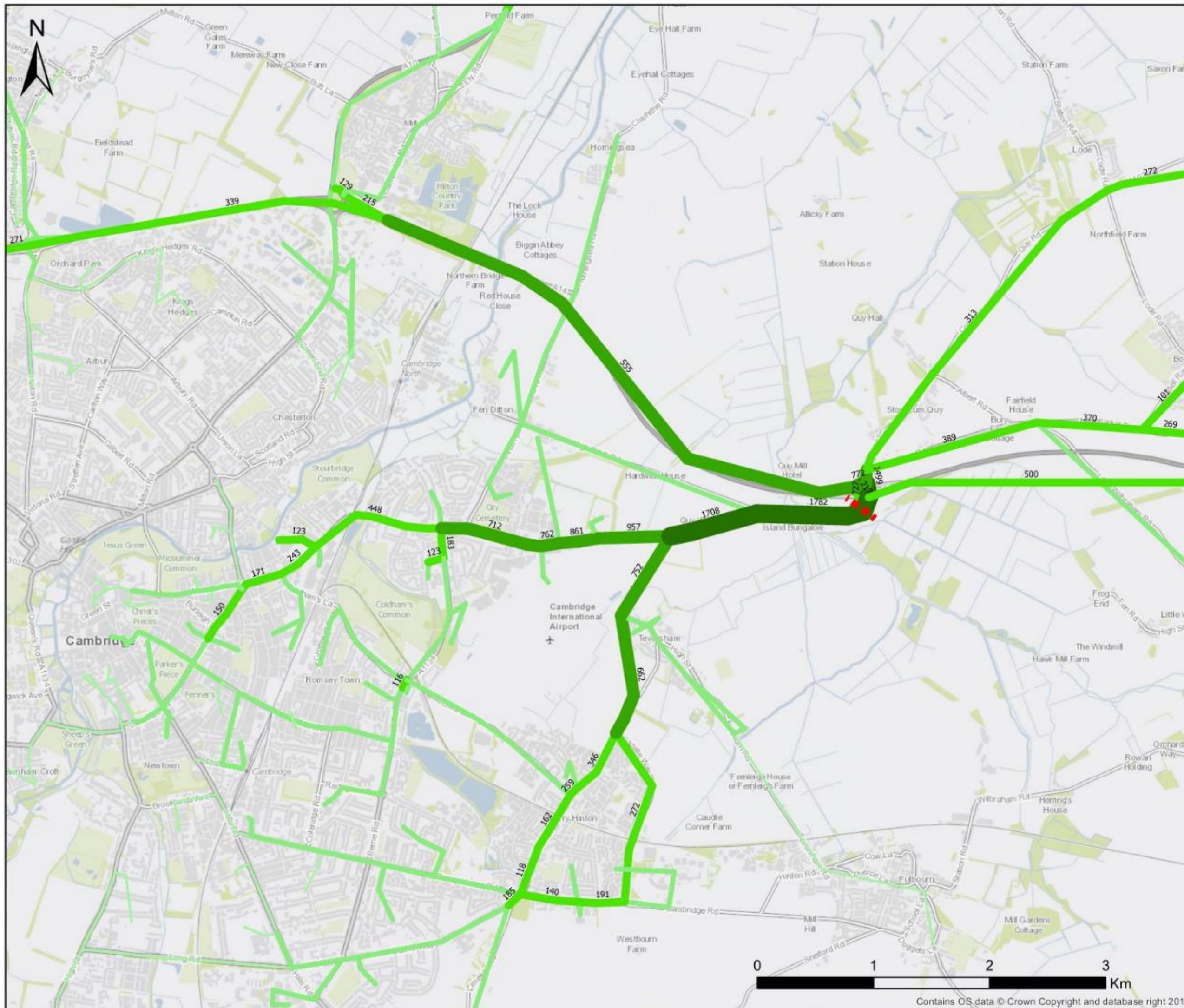
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Figure 2.4: Volume over Capacity in the PM Peak Hour

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AM Peak Select Link Analysis Traffic Flow (PCU)



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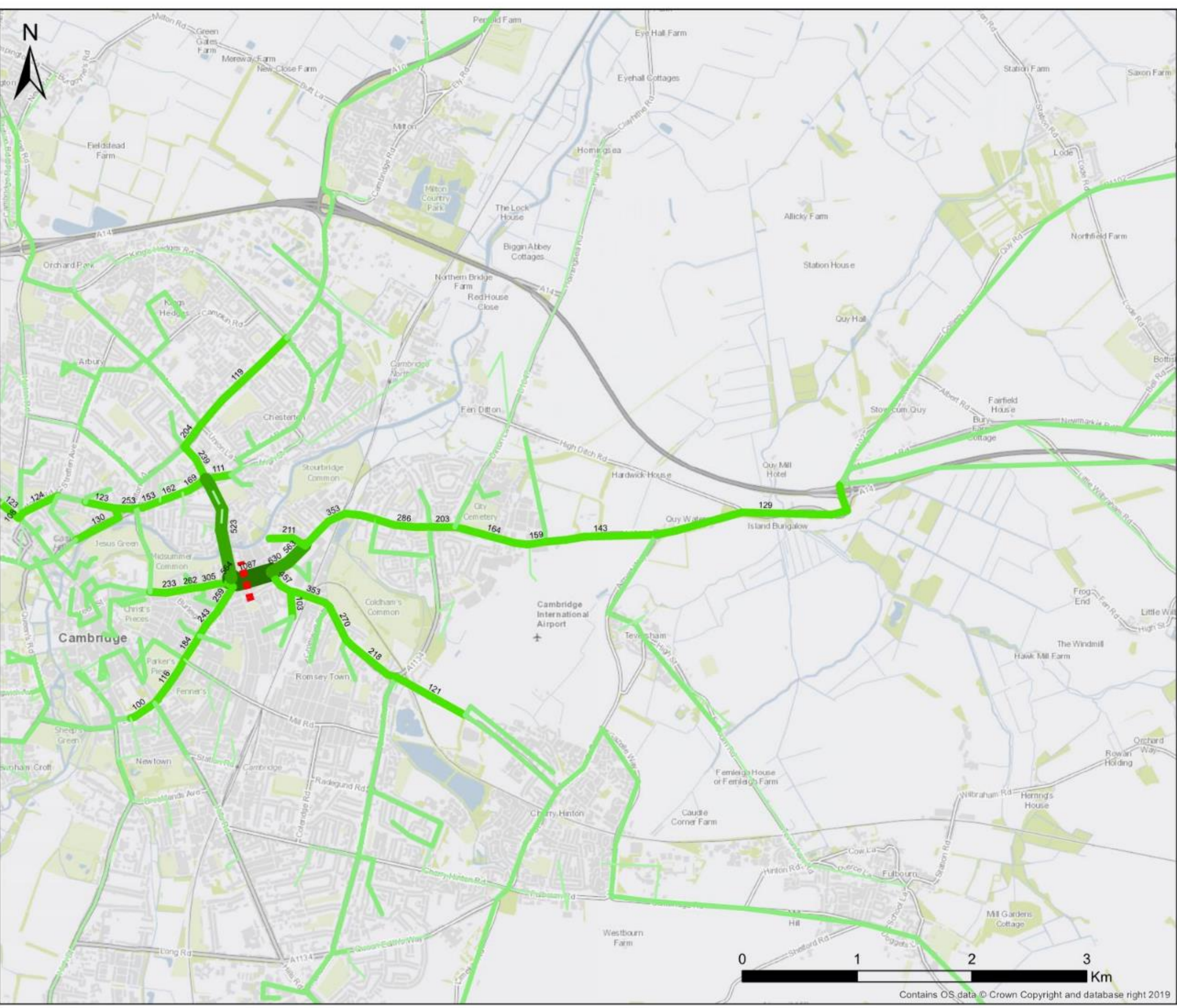


Figure 2.5: Origin and Destination of Vehicles
Travelling West on Newmarket Road close to
Junction with A14.

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PM Peak Select Link Analysis Traffic Flow (PCU)

0 - 1
2 - 10
11 - 100
101 - 500
501 - 1000
1001 - 2000

■ ■ ■ ■ ■ Newmarket Road/ Elizabeth Way - Select Link Location

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Figure 2.6: Origin and Destination of Vehicles Travelling East on Newmarket Road close to Junction with Elizabeth Way.

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2.4 Current Practice – Buses

Journey Times

- 2.4.1 In terms of bus journey times, the inbound bus lanes in the morning peak appear to alleviate the problems of congestion with faster journey times than at other times of the day. However, outbound journeys in the evening peak are significantly impacted with services typically experiencing delays of five to seven minutes, as illustrated in [Figure 2.5](#) and [Figure 2.6](#).
- 2.4.2 It should be noted that the general traffic and bus journey times detailed previously are not directly comparable. The model draws out journey speeds for general traffic between the Quay Interchange and Elizabeth Way Roundabout whilst the bus journey times are derived from Stagecoach data from its buses operating between the city centre and the Park and Ride.

Figure 2.5: Inbound Bus Journey Times

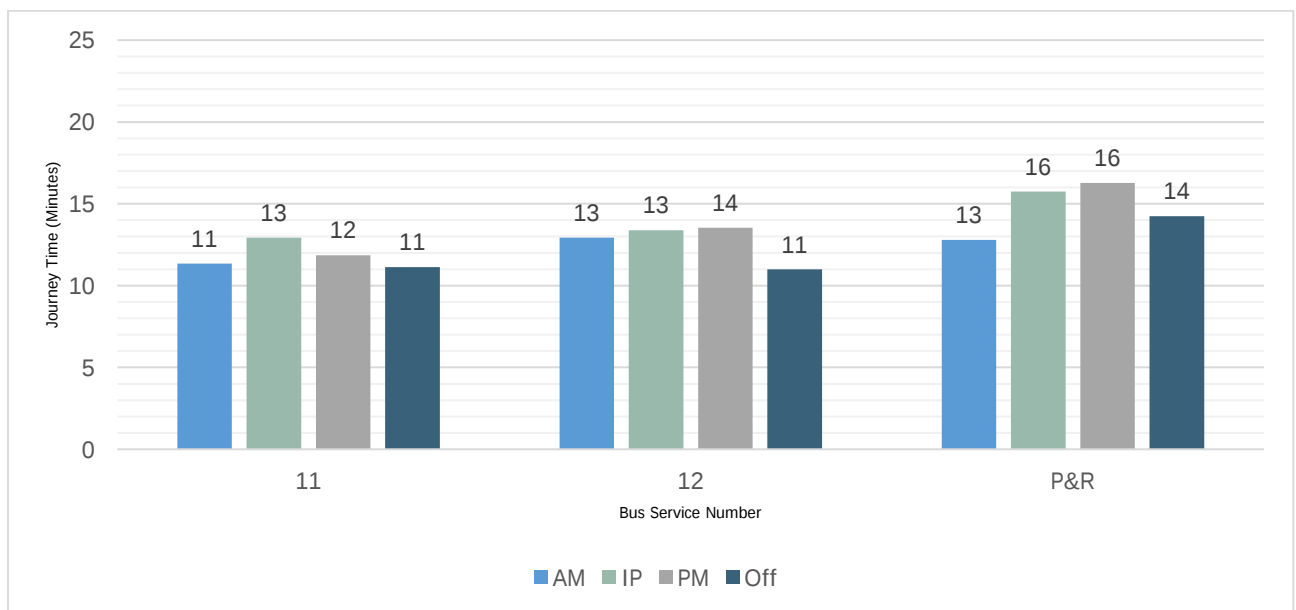
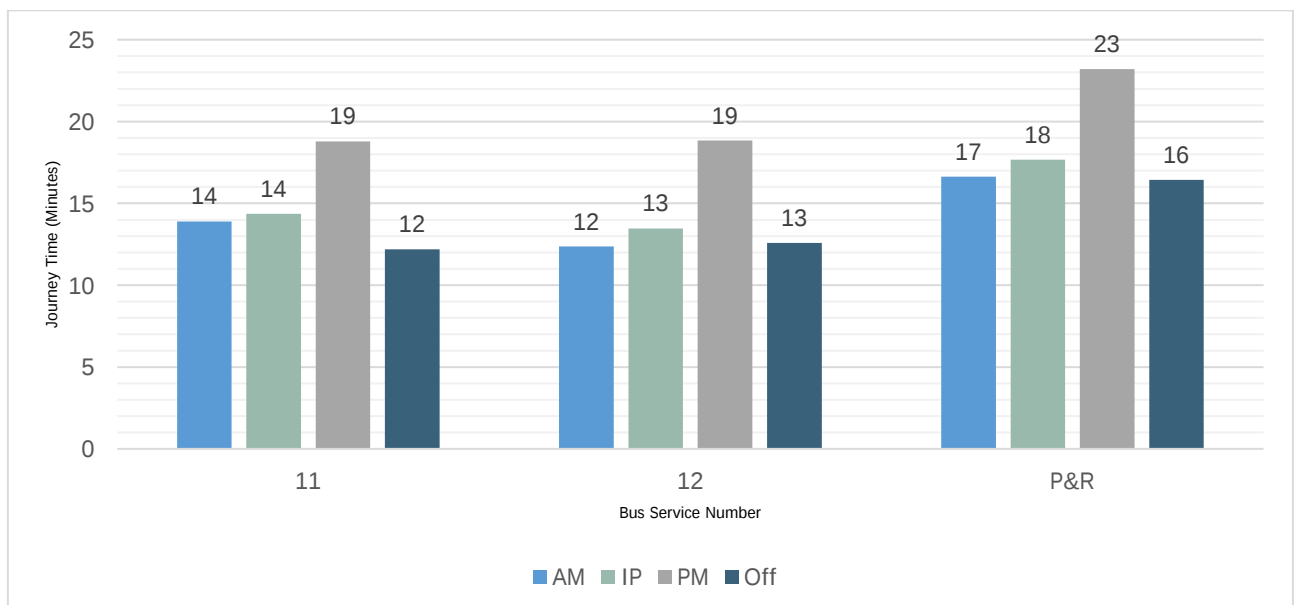


Figure 2.6: Outbound Bus Journey Times



Source: Stagecoach



Patronage

- 2.4.3 Patronage data provided by Stagecoach in relation to their services operating along Newmarket Road demonstrates a significant decline in the popularity of bus service provision along the corridor in the last five years which, in part, may be a reflection of the impact of poor punctuality on bus use. The number of passengers declined by 20% between 2015 and 2019 (see [Table 2.2](#)).

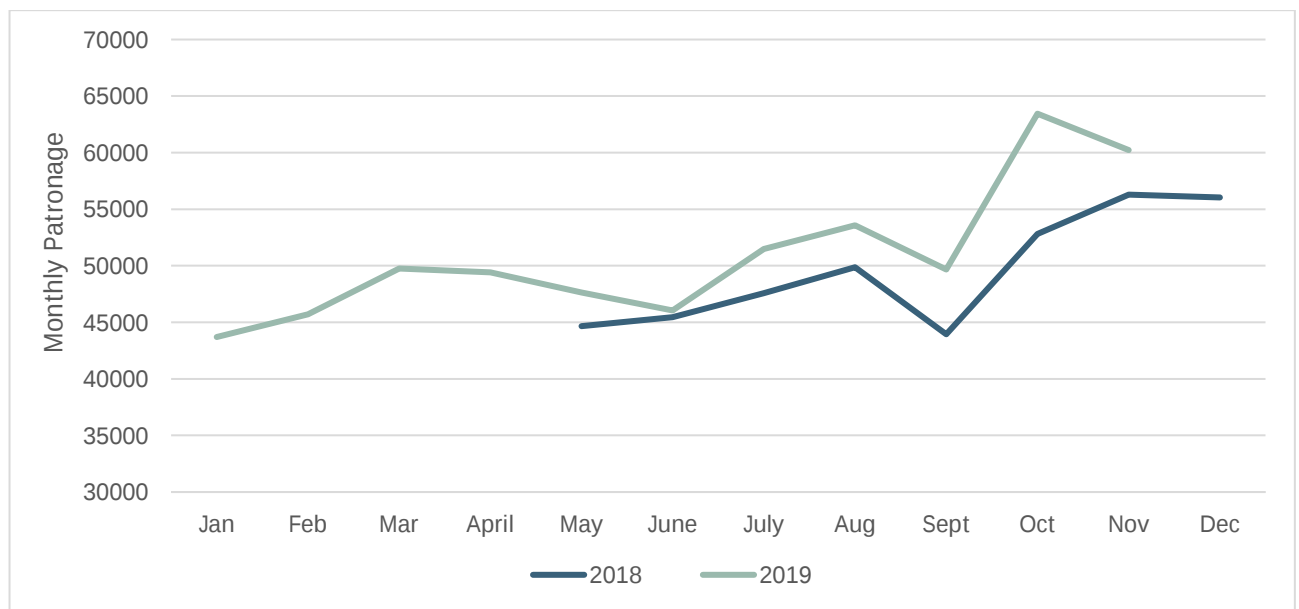
Table 2.2: Total Passenger Boardings on Newmarket Road

Year	Patronage	Annual Change	Cumulative % Change
2015	893,059	-	-
2016	863,316	-29,743	-3%
2017	776,115	-87,201	-13%
2018	723,059	-53,056	-19%
2019	711,424	-11,635	-20%

Source: Stagecoach

- 2.4.4 Conversely the popularity of the Park and Ride service is increasing. The popularity of the Newmarket Road Park and Ride is captured in data collected by Cambridgeshire County Council. The data focuses on the number of cars using the site and so it is not a direct reflection of patronage of the services as car occupancy is not reflected in the figures. Park and Cycle is a popular form of travel into the city centre from Newmarket Road, given the direct access onto the off-road cycle path running alongside the River Cam.
- 2.4.5 Notwithstanding this, [Figure 2.7](#) highlights how the popularity of the site grew on a month by month basis between 2018 and 2019, peaking at over 63,000 vehicles using the site in October 2019, up from almost 53,000 in the same month in 2018.

Figure 2.7: Patronage of Newmarket Road Park and Ride



Source: Cambridgeshire County Council

- 2.4.6 To provide some context for these figures, nationally (outside London) the number of bus trips declined from 2.215 billion trips in 2015/16 to 2.121 billion trips in 2018/19, a 4% decrease in patronage over four years.

2.5 Summary

- 2.5.1 Newmarket Road is not fit for purpose in terms of providing a fast and efficient sustainable transport connection into the centre of Cambridge. The lack of high quality and comprehensive bus and cycle infrastructure fosters a reliance on the car, which in turn generates queuing, congestion and delays. There is a need for these concerns to be addressed in the short term if the city is to move towards achieving its ambitious traffic reduction targets and the benefits this will provide to the quality of life of those living along the corridor.
- 2.5.2 It is also apparent that despite these shortcomings, development pressure in the corridor and further afield remains high. Significant growth is anticipated to come forward through the Greater Cambridge Local Plan. This will exacerbate the increases in journey times caused by background growth in traffic, and developments already committed to come forward by 2036.
- 2.5.3 To ensure that congestion doesn't stifle the housing and economic opportunities along Newmarket Road, and to make sure that it comes forward and can be delivered sustainably, a longer term emphasis needs to be placed on providing the sustainable transport capacity and connectivity to facilitate the aspirations of the Local Plan.



3 | The Long List

3.0 The Long List

3.1 Overview

- 3.1.1 There is a clear need for significant investment in Newmarket Road and the surrounding transport network to address both the current issues facing the corridor, and to help to facilitate the significant level of proposed growth in the east of Cambridge.
- 3.1.2 The Eastern Access Baseline Report identified the problems and constraints associated with travelling into the city from the east and has formed the evidence upon which potential solutions have been identified to transform the corridor into a high-quality sustainable travel route.
- 3.1.3 This assessment, together with input from a programme of extensive engagement activities⁵ including with elected members, transport providers and the public, has generated a series of potential areas of intervention and, within these, individual schemes which could address the overarching objectives of the corridor.
- 3.1.4 Some 59 schemes have been identified in total, as listed in [Table 3.1](#) below and depicted in [Figure 3.1](#) to [Figure 3.10](#).
- 3.1.5 Between them these measures could potentially help to both improve the current sustainable transport offer along Newmarket Road and provide the capacity and connectivity to facilitate housing and employment provision within the adopted Local Plans for both Cambridge and South Cambridgeshire.
- 3.1.6 However, not all of the options present viable solutions and the process through which these have been identified is detailed within later sections of this Report.

Table 3.1: Long List of Interventions

Ref.	Scheme Options
Busways	
BW.01	Online - full length of Newmarket Road.
BW.02	Online - between Elizabeth Way Roundabout and Leper Chapel.
BW.03	Online - between Leper Chapel and Park and Ride.
BW.04	Online - between Park and Ride and A14.
BW.05	Offline (north) - between Leper Chapel and Quy Water via former rail line and High Ditch Road.
BW.06	Offline (north) - between Cambridge North Station and former rail line.
BW.07	Offline (south) - between Leper Chapel and Barnwell Road via Coldham's Common.
BW.08	Offline (south) - between Barnwell Road and P&R via Cambridge Airport (west of runway).
BW.09	Offline (south) - between East Road and Brookfields via Mill Road.
BW.10	Offline (south) - between Brookfields and Coldham's Lane via a new bridge over the rail line.
BW.11	Offline (south) - between Coldham's Lane and P&R via Cambridge Airport (east of runway).
BW.12	Offline (south) – Coldham's Lane between Newmarket Road and south of runway.
Bus Lanes	
BL.01	Extend inbound bus lanes to provide continuous link between P&R and city centre.
BL.02	Remove inbound bus lanes.
BL.03	Remove outbound bus lanes.
BL.04	Extend outbound bus lanes to provide continuous link between city centre and P&R.

⁵ Eastern Access Study – Engagement Summary Report; WYG, August 2020.

Ref.	Scheme Options
BL.05	New outbound bus lane between Elizabeth Way and the Leper Chapel.
BL.06	New tidal bus lane (or busway) between Elizabeth Way and the Leper Chapel.
BL.07	Conversion of the Cambridge to Newmarket Rail Line into a two-way bus lane.
Bus Services	
BS.01	Increase the frequency of existing P&R services.
BS.02	New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
BS.03	Provide new service from P&R to Addenbrooke's hospital and the Biomedical Campus.
Park and Ride	
PR.01	Expansion of current Park and Ride site.
PR.02	Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
PR.03	Relocation of Park and Ride to north of Quy Interchange (A14 Junction 35).
PR.04	New Park and Ride site to the north of Fen Ditton.
Bus Gates	
BG.01	Bus Gate on Newmarket Road.
BG.02	Bus Gate on Mill Road (at bridge over rail line).
Rail	
RA.01	Reinstate the Cambridge to Mildenhall Line.
RA.02	Double track the Cambridge to Newmarket Line.
RA.03	Realignment of the Cambridge to Newmarket Line to the north of Cherry Hinton.
RA.04	Provide new station at 'Cambridge East'.
RA.05	Provide new station at Cherry Hinton.
RA.06	Provide new station at Barnwell.
RA.07	Provide a new Parkway Station at Six Mile Bottom.
RA.08	Provide a passing point near Fulbourn on the Cambridge to Newmarket Line.
Junctions	
JC.01	Reconfiguration of Elizabeth Way Roundabout, including the removal of subway (higher capacity).
JC.02	Reconfiguration of Elizabeth Way Roundabout, including the removal of the subway (lower capacity).
JC.03	Reconfiguration of the Newmarket Road & Coldham's Lane junction.
JC.04	Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (higher capacity).
JC.05	Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (lower capacity).
JC.06	Reconfiguration of the Newmarket Road & Ditton Lane junction (higher capacity).
JC.07	Reconfiguration of the Newmarket Road & Ditton Lane junction (lower capacity).
JC.08	Reconfiguration of A14 Junction 34 (with Ditton Lane) to remove slips.
JC.09	Signalisation of the junction of Newmarket Road and Airport Way.
JC.10	Signalisation and Reconfiguration of Quy Interchange
Highways	
HW.01	Additional lane(s) on Newmarket Road to east of Airport Way junction.
HW.02	One-way traffic on Newmarket Road, Coldham's Lane and Barnwell Road to form gyratory.
HW.03	Priority lane for Ultra Low Emission Vehicles only on Newmarket Road.

Ref.	Scheme Options
HW.04	Removal of two lanes (one inbound, one outbound) between Elizabeth Way and Coldham's Lane.
HW.05	Carriageway widening along Coldham's Lane south of the airport, with a left turn filter lane for buses at the Sainsbury's roundabout.
Intelligent Transport Systems	
ITS.01	Reconfiguration of all signals to manage/control flow along Newmarket Road and wider network.
Active Travel	
AT.01	Provision of continuous segregated inbound cycle lane along Newmarket Road.
AT.02	Provision of continuous segregated outbound cycle lane along Newmarket Road.
AT.03	Promotion of Park and Cycle from the P&R site.
AT.04	Provide a new shared use pedestrian/cycle bridge(s) over the rail line and Coldham's Lane to link the existing 'Tins' cycle path with the airport site.
AT.05	Provide new dedicated cycle lanes along Brookfields / Mill Road.
AT.06	Provide new cycle lanes along Coldham's Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
AT.07	Provide a new off-carriageway pedestrian-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.

- 3.1.7 These areas of intervention are detailed within this chapter, providing reference to the individual scheme options identified. It should be noted that for each scheme, there are potentially numerous variations and sub-options. For example, the provision of a bus lane could vary in terms of its length, hours of operation, nature of vehicles permitted to use it, or if it catered for inbound or outbound buses.
- 3.1.8 We have therefore sought to strike a balance between the detail of each option and not overwhelming the assessment process with every possible permutation. The level of detail associated with each scheme is commensurate with the development of a Strategic Outline Business Case. Refinement of the final schemes' parameters and design will be undertaken at a later stage of the process.
- 3.1.9 Several areas of intervention were omitted from the assessment, including light rail, personal rapid transit and monorails for example. This was on the basis that any measures brought forward would be required to fit the local context and be compliant with the emerging Cambridgeshire Autonomous Metro.

Cambridgeshire Autonomous Metro

- 3.1.10 The Long List focuses on measures to improve the provision of surface level transport which could either complement the Cambridgeshire Autonomous Metro (CAM) or form part of Phase 1 of the network. None of the options within the Long List are considered to be alternatives to the CAM, or to preclude CAM, but conversely none are reliant on the CAM being delivered in full or part. This is an important distinction and should inform the context when considering the listed options.

3.2 Busways

- 3.2.1 Busways provide fully segregated lanes upon which buses, and buses alone, can operate. They enable the buses to operate at high speed, often on a semi-automated basis providing fast and unhindered travel for compatible vehicles. They offer more flexibility than a tram or heavy rail solution as the buses can divert off the busway onto the wider road network.
- 3.2.2 There is local precedent in the use of busways in Cambridge, with 16 miles of provision in two sections between the city and St Ives to the north, and to Addenbrooke's Hospital to the south. Busways have also been provided further afield such as between Luton and Dunstable. Guidance may be physical as in the existing Cambridge Busway, or technological.



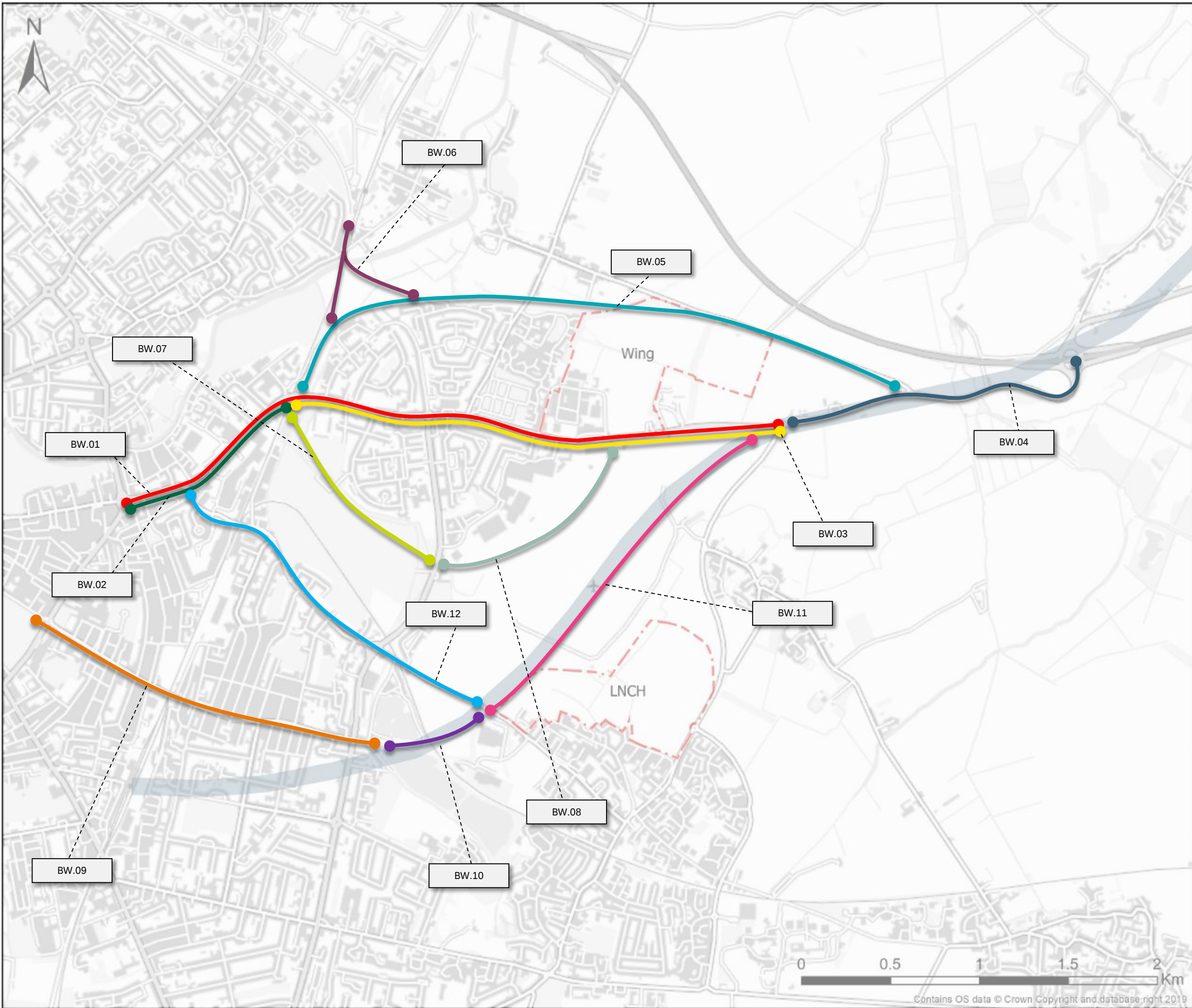
Image credits: Greater Cambridge Partnership

3.3 Bus Lanes

- 3.3.1 Bus lanes provide a flexible, relatively low-cost bus priority intervention which are popular throughout the country. Their versatility is one of their biggest attributes, in that they can operate all day or just for parts of the day when the need is greatest.
- 3.3.2 They can also be operated with various restrictions, in some places permitting any of taxis, high occupancy vehicles, two-wheelers, and ultra-low emission vehicles to also use them.
- 3.3.3 Compliance amongst general traffic users can sometimes be an issue but the use of Automatic Number Plate Recognition (ANPR) technology can alleviate these concerns.



Image credits: WYG



- KEY:**
- **BW.01** Online - full length of Newmarket Road.
 - **BW.02** Online - between Elizabeth Way Roundabout and Leper Chapel.
 - **BW.03** Online - between Leper Chapel and Park and Ride.
 - **BW.04** Online - between Park and Ride and A14.
 - **BW.05** Offline (north) - between Leper Chapel and Quy Water via former rail line and High Ditch Road.
 - **BW.06** Offline (north) - between Cambridge North Station and former rail line.
 - **BW.07** Offline (south) - between Leper Chapel and Barnwell Road via Coldham's Common.
 - **BW.08** Offline (south) - between Barnwell Road and P&R via Cambridge Airport (west of runway).
 - **BW.09** Offline (south) - between East Road and Brooklands via Mill Road.
 - **BW.10** Offline (south) - between Brookfields and Coldham's Lane via a new bridge over the rail line.
 - **BW.11** Offline (south) - between Coldham's Lane and P&R via Cambridge Airport (east of runway).
 - **BW.12** Offline (south) – Coldham's Lane between Newmarket Road and south of runway.

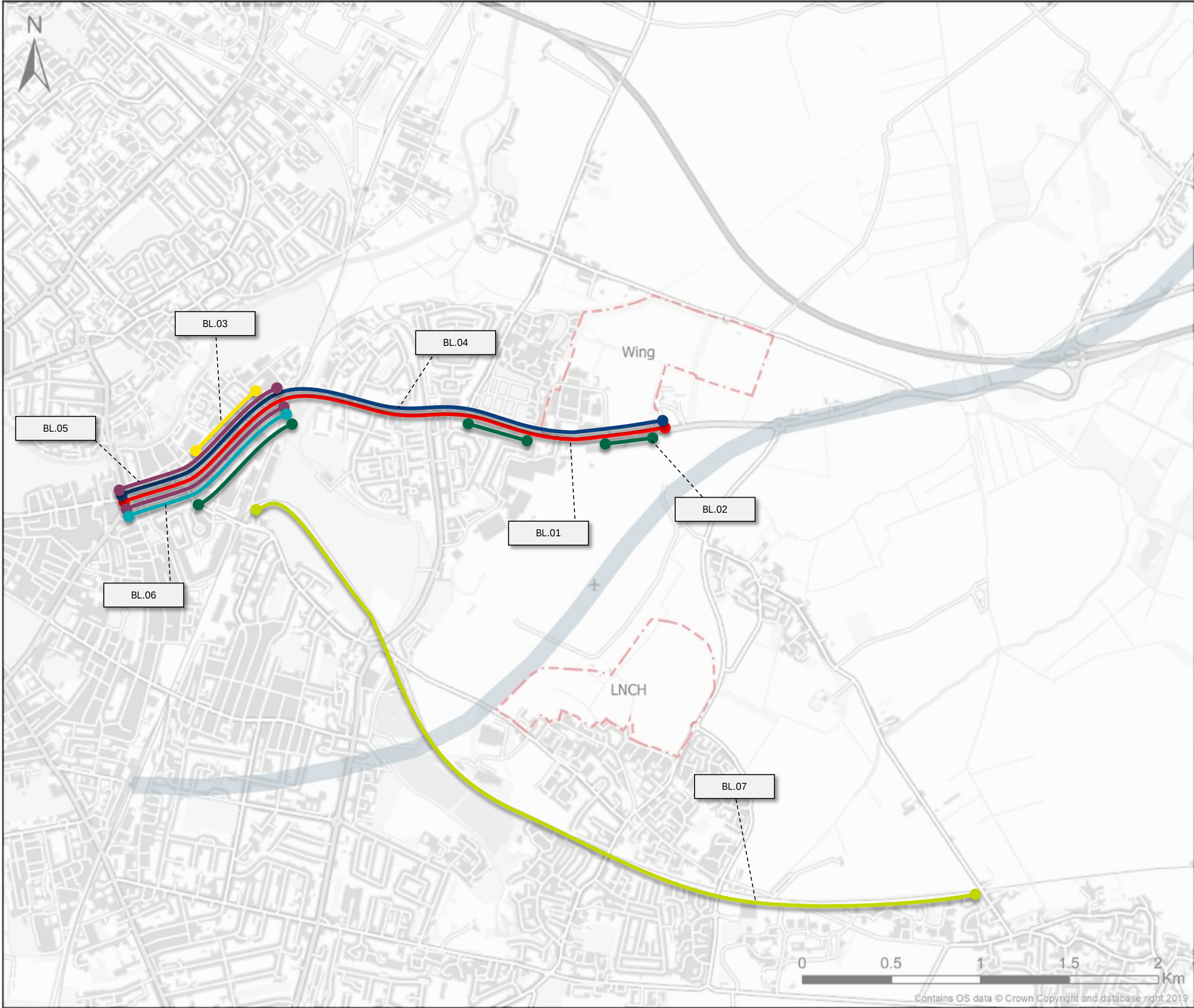
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Figure 3.1: Guided Busway Options

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Project No. A081175-146	Office 35	Type 18	Drawing No. -	Revision -		



- KEY:**
- **BL.01** Extend inbound bus lanes to provide continuous link between P&R and City Centre.
 - **BL.02** Remove inbound bus lanes.
 - **BL.03** Remove outbound bus lanes.
 - **BL.04** Extend outbound bus lanes to provide continuous link between City Centre and P&R.
 - **BL.05** New inbound/outbound bus lanes between Elizabeth Way and the Leper Chapel.
 - **BL.06** New tidal bus lane (or busway) between Elizabeth Way and the Leper Chapel.
 - **BL.07** Conversion of Cambridge to Newmarket Line as a two-way bus lane.

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Figure 3.2: Bus Lane Options

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
NTS	BG	09.03.20	BK	09.03.20	BK	09.03.20
Project No.	Office	Type	Drawing No.	Revision		
A081175-146	35	18	-	-		

3.4 Bus Services

- 3.4.1 For all the supporting infrastructure in place, it is the actual bus services which connect people to places. The frequency of provision and the destinations served are at the heart of making bus based travel an option for many, and whilst Newmarket Road is well served by existing bus services, with the anticipated increase in demand along the corridor, there is scope for it to be improved.
- 3.4.2 Given the commercial nature of service provision however, changes in operation are often hard to secure without bus franchising or local authorities tendering for specific routes. Such issues with the delivery of services are excluded from this appraisal for ease of analysis.



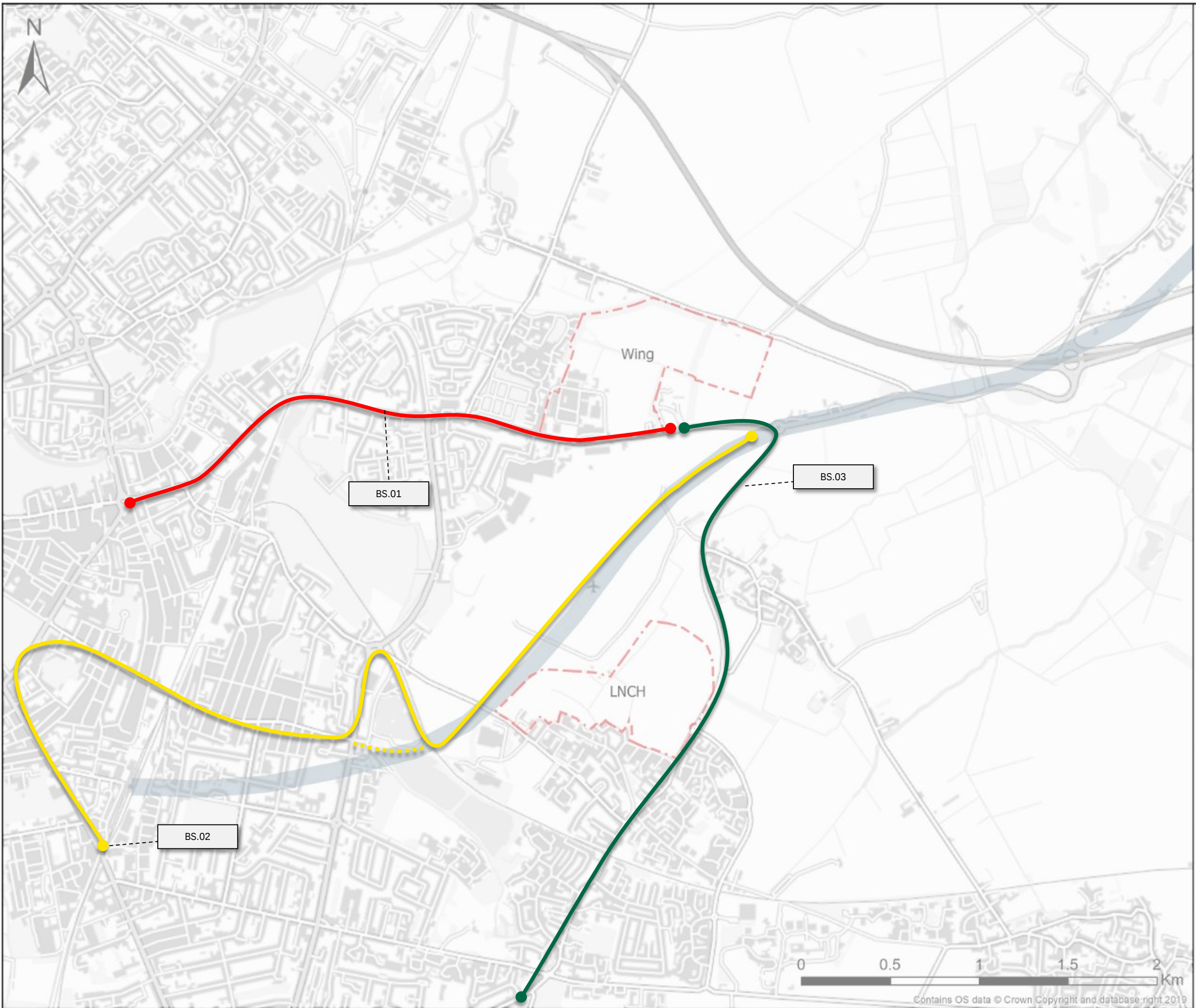
Image credits: WYG

3.5 Park and Ride

- 3.5.1 Park and Ride sites enable car-based commuters to travel the final stages of their journey by bus or tram, avoiding congestion and parking charges in city centres. They enable the interception of vehicles before they contribute towards delays on the network, often catering for large catchment areas where bus provision may be less attractive.
- 3.5.2 Park and Ride is a popular measure already in use in the Cambridge area, including on Newmarket Road itself, and potentially an important ingredient in any package of measures which are taken forward.



Image credits: WYG



KEY:

- **BS.01** Increase frequency of existing P&R service.
- **BS.02** New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
- **BS.03** Provide new service from P&R to Addenbrookes hospital and the Biomedical Campus.

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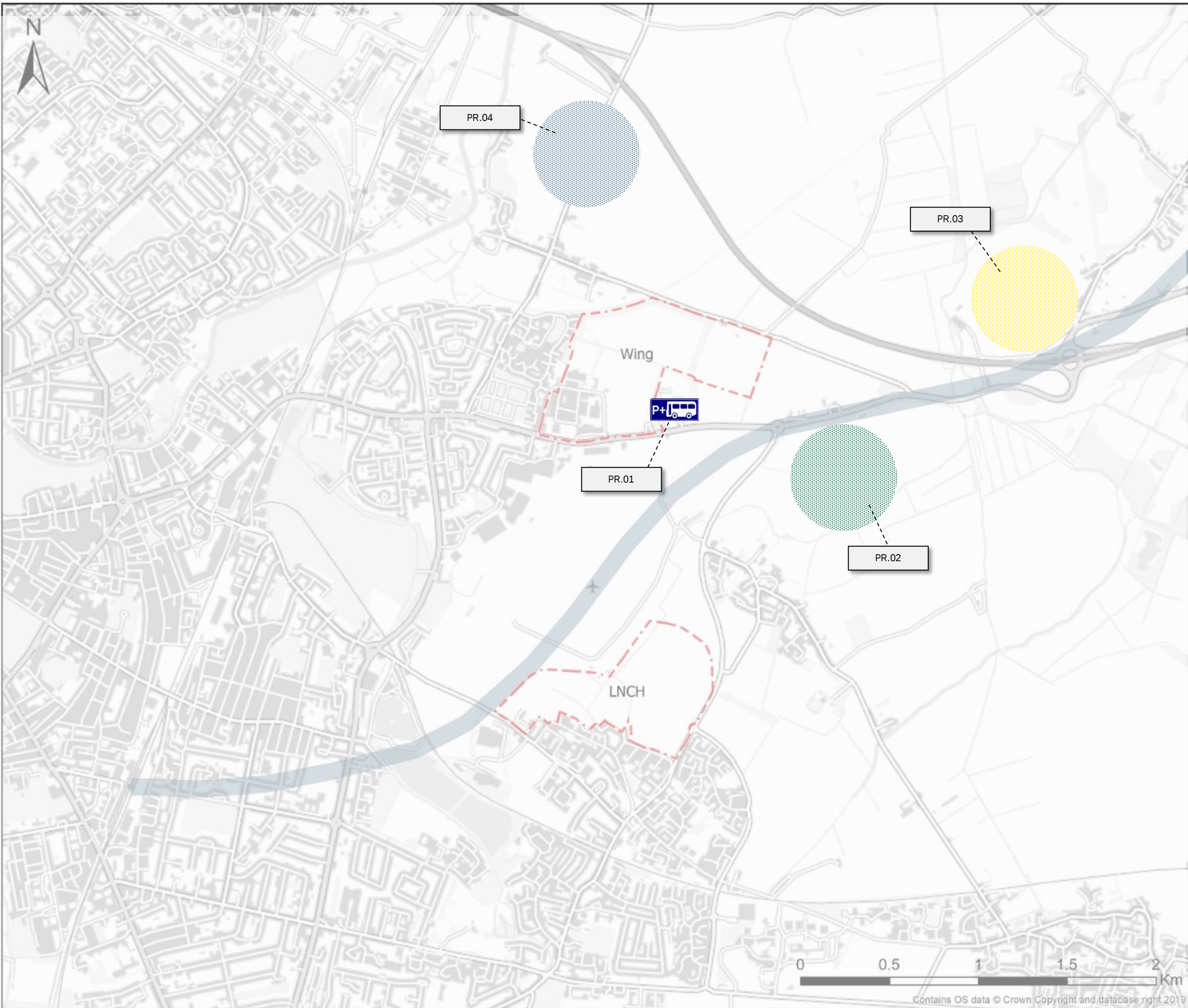
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Figure 3.3: Bus Service Options

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
NTS	BG	09.03.20	BK	09.03.20	BK	09.03.20
Project No.	Office	Type	Drawing No.	Revision		
A081175-146	35	18	-	-		



KEY:

- **PR.01** Expansion of current site.
- **PR.02** Relocation to south of Newmarket Road and east of Airport Way.
- **PR.03** Relocation to north of Quoy Interchange (A14 Junction 35).
- **PR.04** New P&R site to the north of Fen Ditton.

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Figure 3.4: Park and Ride Options

Scale @ A3 NTS	Drawn BG	Date 09.03.20	Checked BK	Date 09.03.20	Approved BK	Date 09.03.20
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3.6 Bus Gates

- 3.6.1 Bus gates restrict use of a road to buses and active travel users only. As such they are a cost-effective measure when seeking to reduce the volume of traffic in an area or along a corridor, although to ensure their effectiveness, they need to be supported by physical barriers or ANPR enforcement.
- 3.6.2 Bus gates have the potential to displace a lot of traffic which will reassign elsewhere on the network but provide a strategic advantage to buses as a result of the more competitive journey times they can subsequently offer.



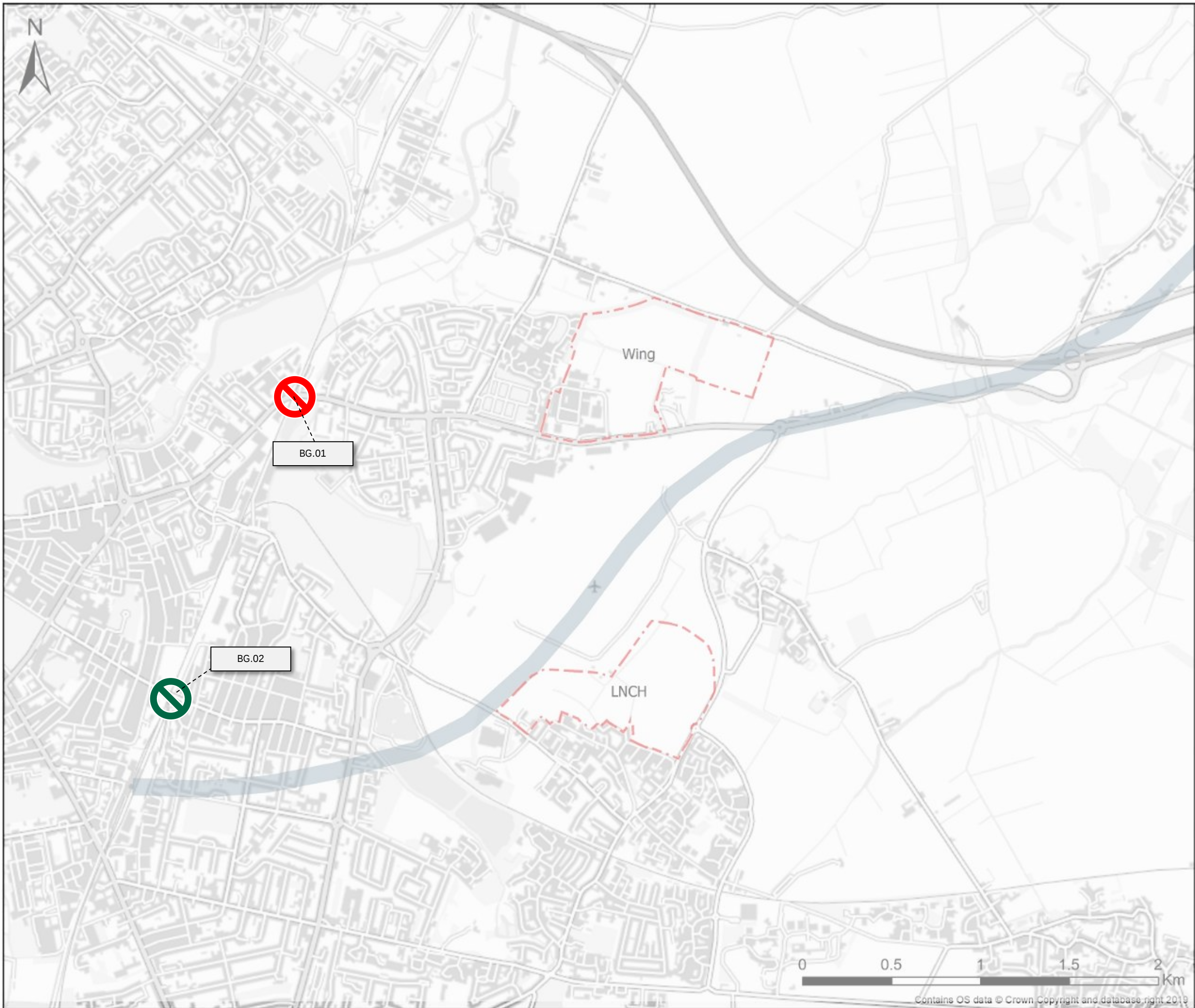
Image credits: WYG

3.7 Rail

- 3.7.1 The scope exists within the east of Cambridge to utilise two heavy rail lines through which to provide a mass transit alternative to the car. The Cambridge to Newmarket Line runs parallel to Coldham's Lane to the south of the airport, before passing through Cherry Hinton, whilst the broad alignment of the former Cambridge to Mildenhall Line is still intact, notwithstanding the fact that sections around the northern edge of Barnwell have been built upon.
- 3.7.2 Both lines provide direct access into Cambridge Station and the onward interchange opportunities it presents. Heavy rail can accommodate significantly higher passenger volumes than other modes, and is not impeded by traffic, but is less flexible as an option.



Image credits: WYG



- KEY:**
- **BG.01** Newmarket Road (at the Leper Chapel).
 - **BG.02** Mill Road (at bridge over rail line).

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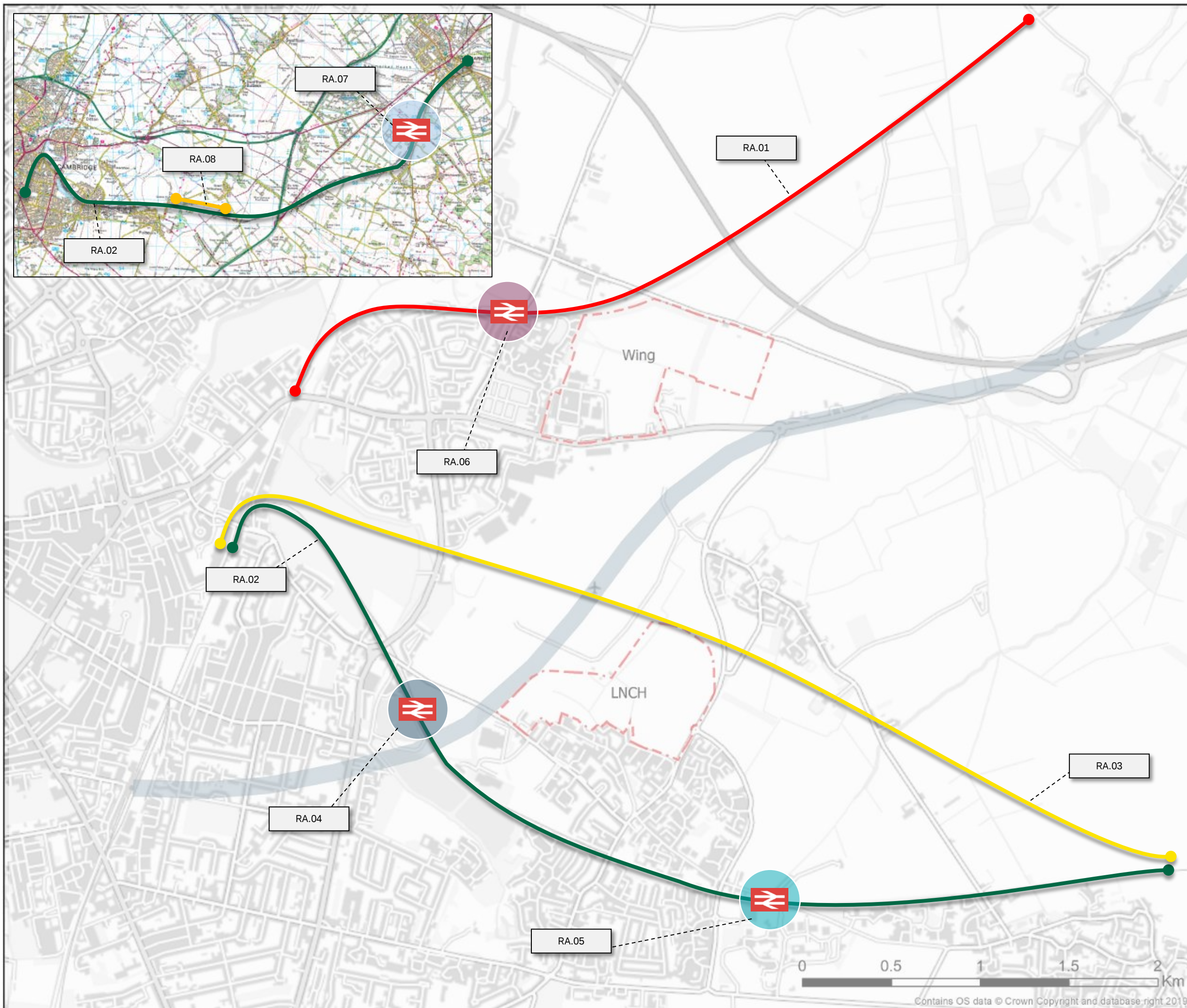
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Figure 3.5: Bus Gate Options

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NTS	BG	09.03.20	BK	09.03.20	BK	09.03.20
Project No.	Office	Type	Drawing No.	Revision		
A081175-146	35	18	-	-		



KEY:

- **RA.01** Reinstates the Cambridge to Mildenhall Line.
- **RA.02** Double track the Cambridge to Newmarket Line.
- **RA.03** Realignment of the Cambridge to Newmarket Line to the north of Cherry Hinton.
- **RA.04** Provide new station at 'Cambridge East'.
- **RA.05** Provide new station at Cherry Hinton.
- **RA.06** Provide new station at Barnwell.
- **RA.07** Provide a new station at Six Mile Bottom.
- **RA.08** Provide a passing loop near Fulbourn on the Cambridge to Newmarket Line.

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Figure 3.6: Rail Options

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NTS	BG	09.03.20	BK	09.03.20	BK	09.03.20
Project No.	Office	Type	Drawing No.	Revision		
A081175-146	35	18	-	-		

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3.8 Junctions

- 3.8.1 Junctions are often the locations along a corridor where delays occur and accidents tend to happen. Changing their design can therefore have a significant impact upon the capacity of a corridor, the priority given to public transport and active travel users, and the actual and perceived safety of a route.
- 3.8.2 Whilst changes to individual junctions can make a difference to the operation of a whole corridor, a strategic approach which targets all junctions has the potential for more comprehensive management of traffic flow.



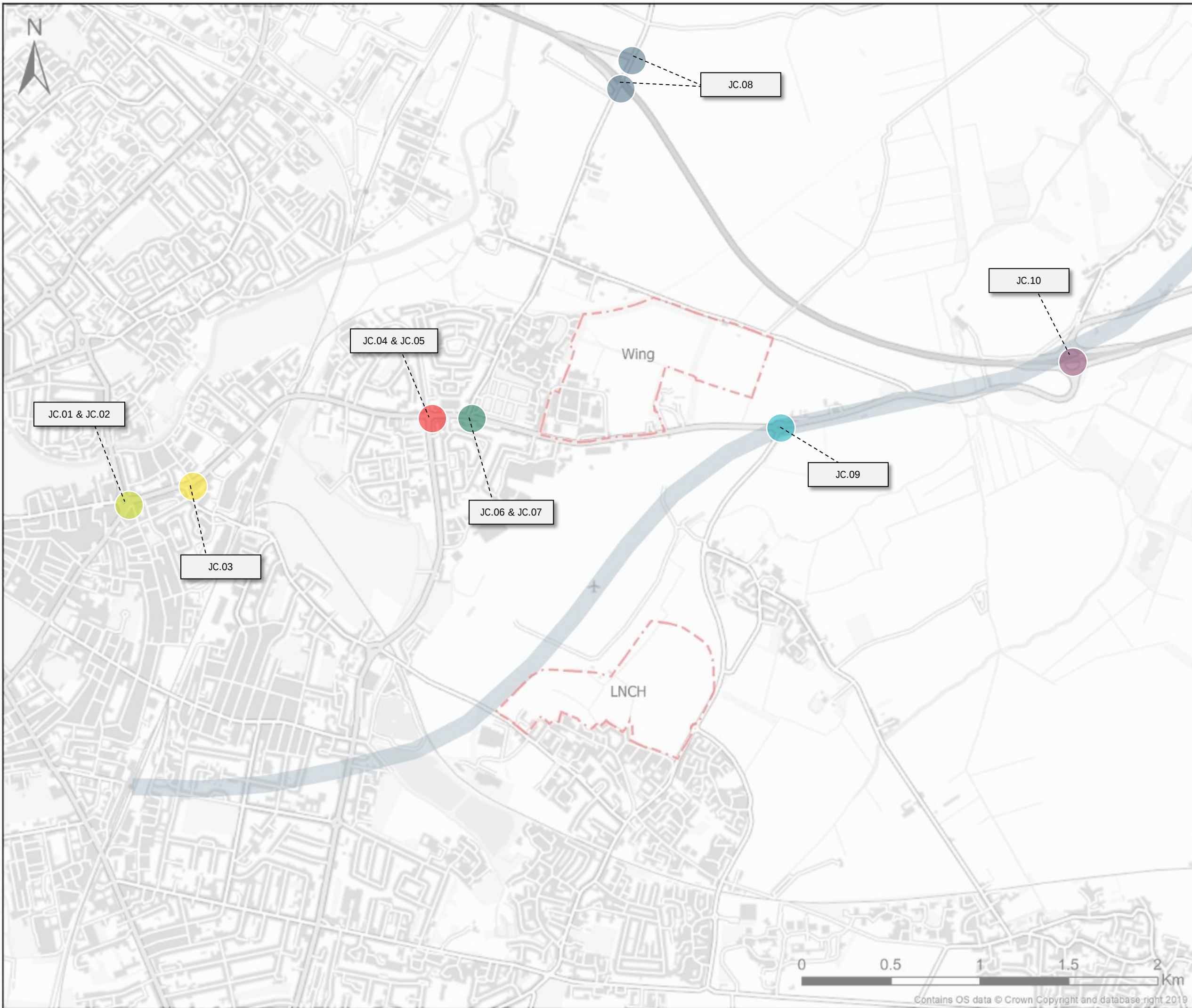
Image credits: WYG

3.9 Highways

- 3.9.1 Where there is a disconnect between the characteristics of the highway network and the local area it serves, all road users can suffer. Insufficient capacity, poor route choice and conflicting movements can result in delays, raise safety concerns and stifle the delivery of growth.
- 3.9.2 The section of Newmarket Road between Barnwell Road and the Elizabeth Way roundabout forms part of the designated ring road for the city and as such has a strategic role to play in enabling traffic to circulate effectively within the urban area. Given the limited physical road space in the study area however, it is important that options are explored through which to optimise its utilisation.



Image credits: WYG



KEY:

- **JC.01** Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (higher capacity).
- **JC.02** Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (lower capacity).
- **JC.03** Reconfiguration of the Newmarket Road & Coldham's Lane junction.
- **JC.04** Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (higher capacity).
- **JC.05** Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (lower capacity).
- **JC.06** Reconfiguration of the Newmarket Road & Ditton Lane junction (higher capacity).
- **JC.07** Reconfiguration of the Newmarket Road & Ditton Lane junction (lower capacity).
- **JC.08** Reconfiguration of A14 Junction 34 (with Ditton Lane) to remove slips.
- **JC.09** Signalisation of the junction of Newmarket Road and Airport Way.
- **JC.10** Signalisation and Reconfiguration of Quay Interchange

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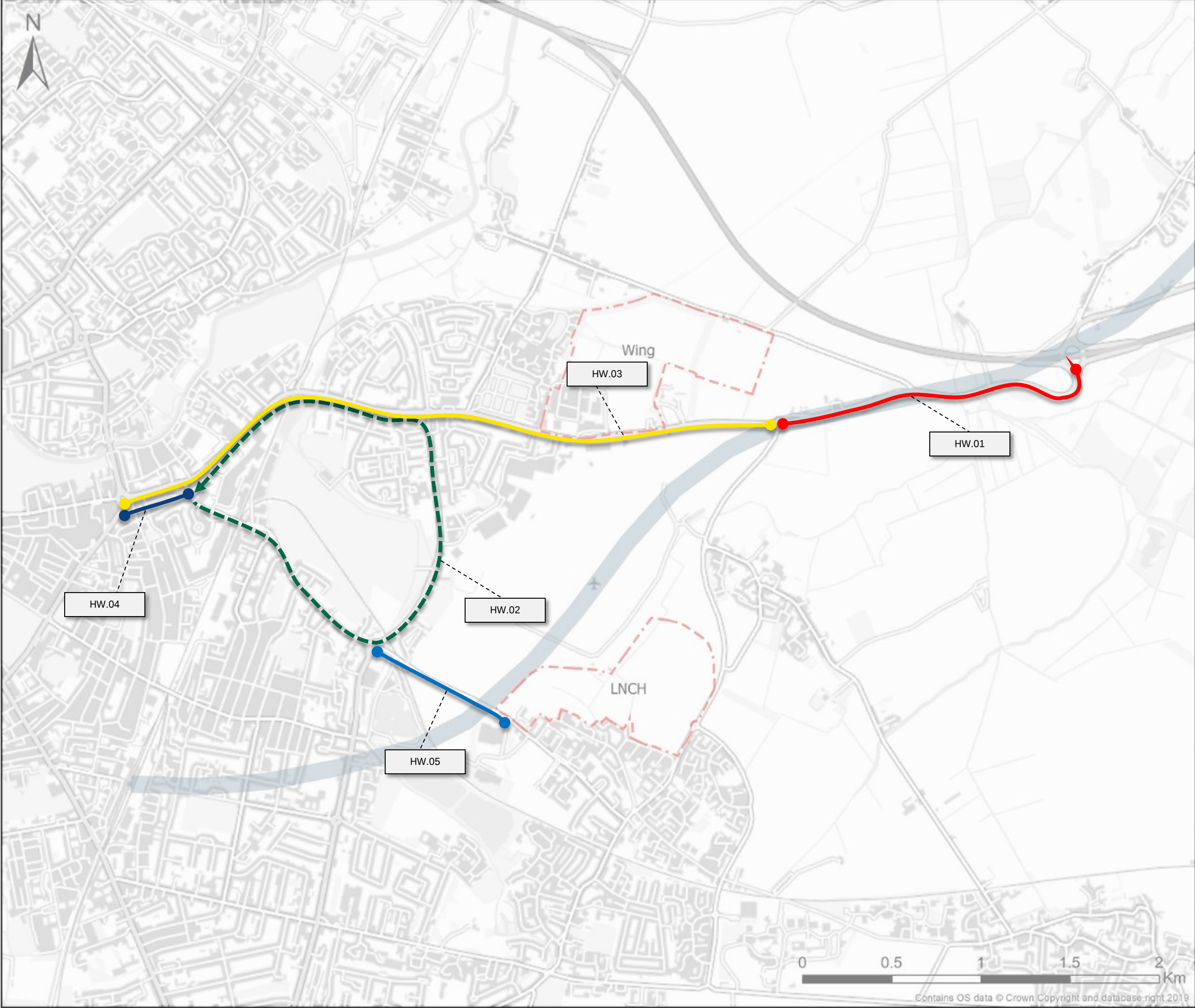
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Figure 3.7: Junction Improvement Options

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Project No. A081175-146	Office 35	Type 18	Drawing No.	-	Revision	-



- KEY:**
- **HW.01** Additional lane(s) on Newmarket Road to east of Airport Way junction.
 - **HW.02** One-way traffic on Newmarket Road, Coldham's Lane and Barnwell Road to form gyratory.
 - **HW.03** Priority lane for Ultra Low Emission Vehicles on Newmarket Road.
 - **HW.04** Removal of two lanes (one inbound, one outbound) between Elizabeth Way and Coldham's Lane.
 - **HW.05** Carriageway widening along Coldham's Lane south of the airport, with a left turn filter lane for buses at the Sainsbury's roundabout.

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Figure 3.8: Highway Options

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Project No. A081175-146	Office 35	Type 18	Drawing No. -	Revision -		

3.10 Intelligent Transport Systems

- 3.10.1 The use of technology provides the scope to maximise the efficiency of highway capacity through better management of traffic flows. Signalised junctions can be fitted with cameras, sensors and other monitoring equipment to help regulate the flow along a corridor, only allowing through demand which would not result in queues and delays further downstream.
- 3.10.2 The technology can be applied to a single corridor or a much wider network and can be applied to give priority to buses and other vehicle types if required.



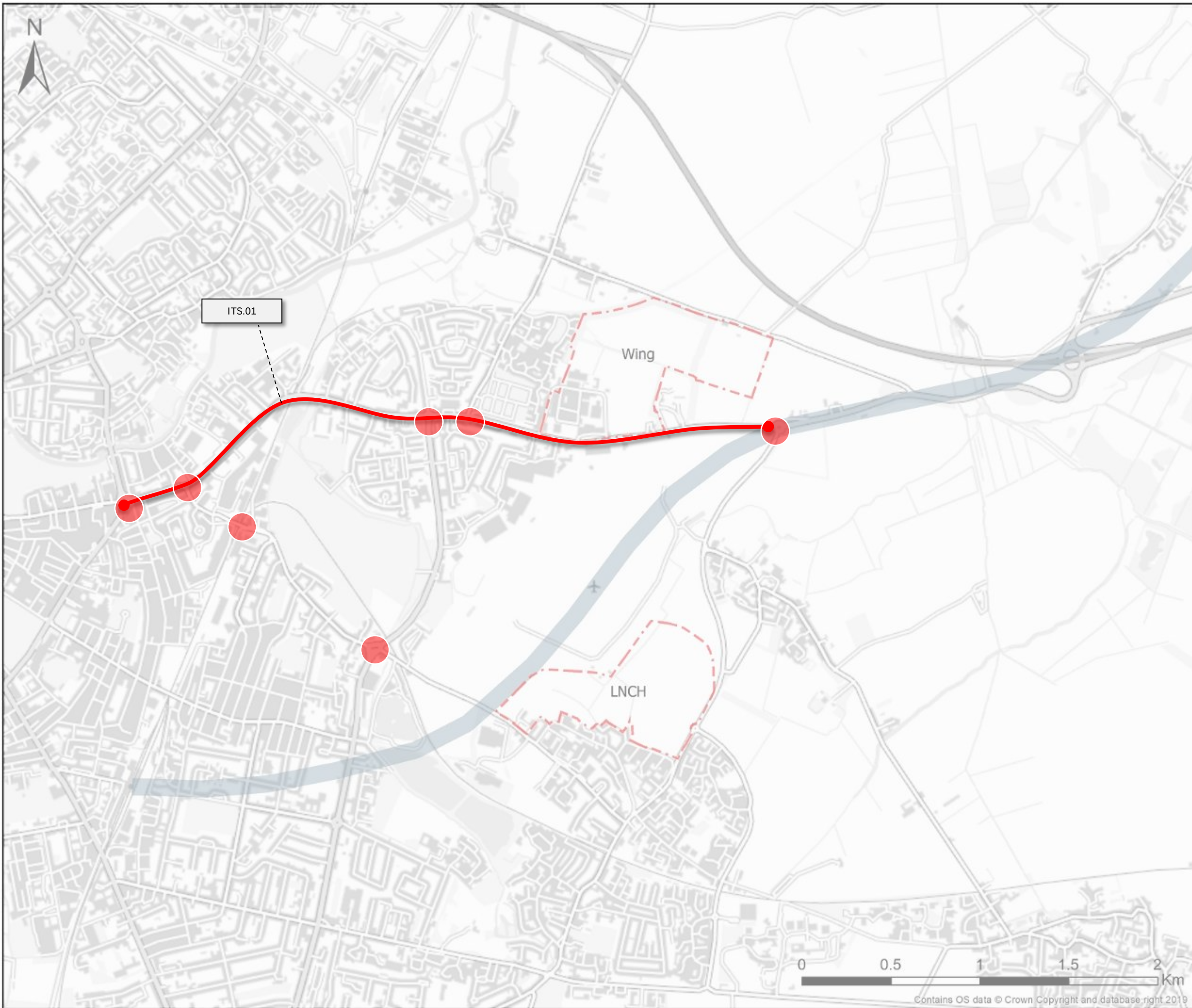
Image credits: WYG

3.11 Active Travel

- 3.11.1 Measures to cater for those travelling by bike, on foot or equestrians not only help to provide attractive alternatives to the car for short trips, but also have the ability to improve the public realm and social cohesiveness of an area, and as such, can help meet priorities far beyond transport itself.
- 3.11.2 In addition, the city's cycling culture provides some assurances that if high quality infrastructure is provided, then it will be utilised and provide the additional capacity and connectivity to meet the needs of many in the local area.



Image credits: WYG



- KEY:**
- ITS.01** Reconfiguration of all signals to manage/control flow along Newmarket Road & wider network.

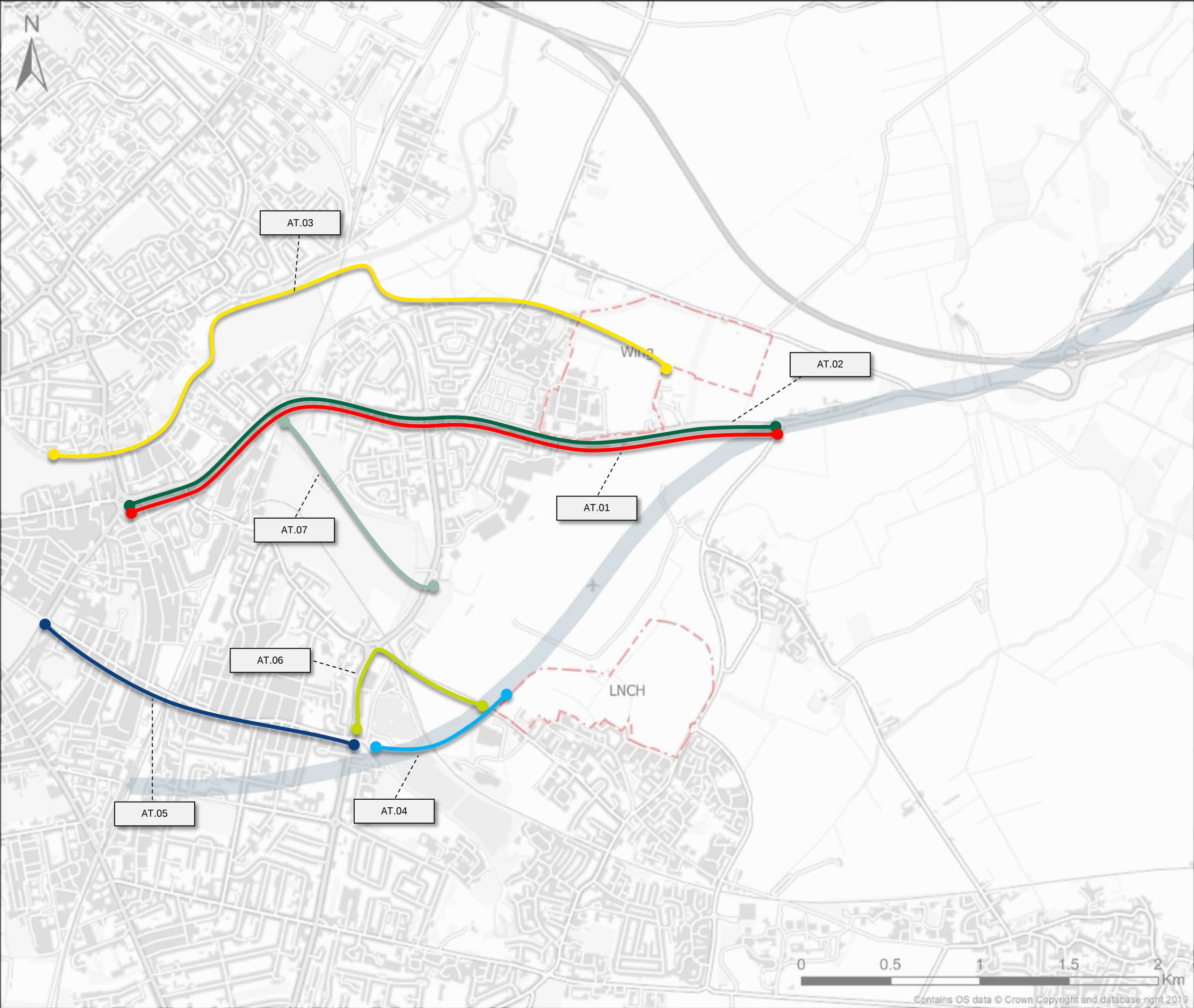
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Figure 3.9: Intelligent Transport System Options

Scale A3 NTS	Drawn BG	Date 09.03.20	Checked BK	Date 09.03.20	Approved BK	Date 09.03.20
Project No. A081175-146	Office 35	Type 18	Drawing No. -	Revision -		



KEY:

- **AT.01** Provision of continuous segregated inbound cycle lane along Newmarket Road.
- **AT.02** Provision of continuous segregated outbound cycle lane along Newmarket Road.
- **AT.03** Promotion of Park and Cycle from the P&R site.
- **AT.04** Provide a new shared use ped/cycle bridge(s) over the rail line and Coldham's Lane to link the existing 'Tins' cycle path with the airport site.
- **AT.05** Provide new dedicated cycle lanes along Brookfields / Mill Road.
- **AT.06** Provide new cycle lanes along Coldham's Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
- **AT.07** Provide a new off-carriageway ped-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.

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REV	DESCRIPTION	BY	CHK	APP	DATE
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Figure 3.10: Active Travel Options

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
NTS	BG	09.03.20	BK	09.03.20	BK	09.03.20
Project No.	Office	Type	Drawing No.	Revision		
A081175-146	35	18	-	-		

3.12 Summary

- 3.12.1 The option generation process and long listing exercise has sought to provide an exhaustive list of all realistic ideas and initiatives which could contribute towards the overarching objectives of the study and provide the step-change in public transport provision required in the east of the city.
- 3.12.2 The Long List itself reflects many different areas of intervention in this regard, ranging from high cost heavy infrastructural improvements, to smaller scale, lighter touch measures, although it does not incorporate travel demand management measures, as these are beyond the scope of the study and are part of a more strategic assessment of the needs of the Greater Cambridge area as a whole, and are addressed within the City Access study.
- 3.12.3 What it does show however, is that despite the complexity and constraints of the study area, there remains scope for significant levels of investment, some of which would provide localised improvements, and others which would see a more strategic shift in the nature of travel patterns.



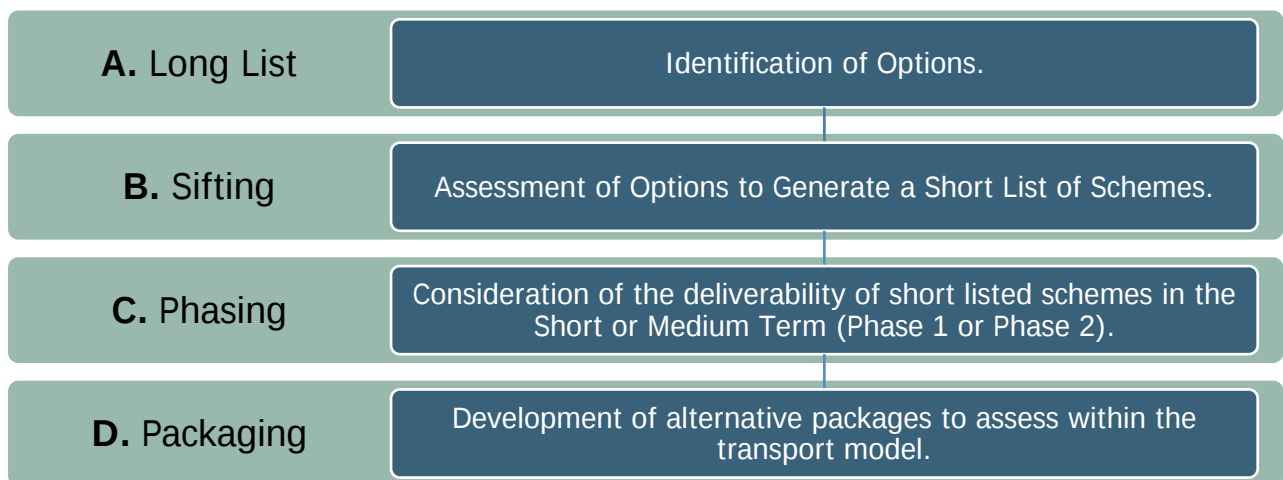
4 | Sifting of the Long List

4.0 Sifting of the Long List

4.1 Overview

- 4.1.1 Following the identification of the Long List of potential measures to improve the capacity and connectivity of sustainable transport provision in the east of the city, a sifting process was undertaken through which to filter out those schemes which would not meet the overarching objectives of the study or which were deemed unrealistic from a deliverability perspective (see [Figure 4.1](#)).

Figure 4.1: Sifting Process



- 4.1.2 A staged approach was adopted through which to refine, phase and package the schemes prior to their assessment within the Cambridge Paramics Model. This chapter details the process and outputs of the sifting and assessment, together with the rationale behind the phasing and packaging of interventions.

4.2 Assessment Criteria

- 4.2.1 The sifting process focused on the ability of each measure to address locally specific objectives and deliverability issues which could form showstoppers preventing the options from having any realistic chance of implementation.
- 4.2.2 Schemes were expected to meet at least one of the objectives and present no major deliverability issues to be taken forward to the second stage of the sifting process based upon a qualitative evaluation undertaken by an experienced panel of transport professionals.
- 4.2.3 The assessment criteria which formed the basis to the assessment are contained within [Table 4.1](#), together with the rationale behind their use and suitability. Cumulatively they reflect aspects of the overarching objectives for the study identified at the conclusion of the Baseline Report.
- 4.2.4 The criteria also cover the key factors which will determine if the schemes are realistic and deliverable, and correlate with the broad framework of the Department for Transport's Early Assessment and Sifting Tool (EAST).

Table 4.1: Assessment Criteria

Area	Criteria	Rationale
Objectives		
Capacity	Increase in Public Transport Capacity	The ability of the intervention to enable more people to travel to and from the city using public transport at any given time. This could be related to additional seating on existing services, increased frequency of existing services or entirely new services. Whilst not directly affecting these, various interventions could allow for the potential for any of these to be increased.
	Ability to contribute to 24% reduction in traffic levels	Actively discourages travel by car to help reduce traffic in Cambridge by 24% according to GCP goals. This could comprise reducing lane and junction capacity as well as closing off direct through-routes for general traffic. These interventions then detract from the attractiveness of the car when compared to other modes of travel.
	Propensity to Reduce Congestion / Delay	The extent to which the intervention will alleviate or bypass pinch points in the network.
Connectivity	Reduced Journey Time for Public Transport	Enables people to be able to travel to and from the city quicker using public transport when compared to the existing situation. What is also key is the competitiveness of public transport journey times against that of the car.
	Increased Reliability for Public Transport	Enables public transport vehicles to better serve their designated stops as timetabled and displayed. Interventions will also minimise risk of unannounced delay to public transport. This will also help to change public perceptions of lateness and 'four at once'.
	Ease of Interchange	Facilitates enhanced transfer between different modes of public transport whilst including provision for cycling. This enlarges the jobs market catchment for residents looking to travel by sustainable modes of transport whilst also encouraging those in cars to make a switch should no direct public transport service between their origin and destination be available to them.
	Benefits to Active Travel	Supports the attractiveness of walking, cycling and other active travel modes along the corridor. Benefits could be realised by interventions in various ways, including connectivity – facilitating more direct routes, permeability – allowing ease of crossing major junctions and safety.
	Supports the Cambridgeshire Autonomous Metro	Interventions that complement (or do not compromise or compete against) the delivery of CAM through providing early infrastructure for the CAM itself to utilise or by strengthening the public transport offer along the Eastern Corridor.
	Scale of Catchment (Housing/Jobs)	The size/population of existing residential and employment areas that any particular intervention could serve, based upon the 400m and 800m distances widely acknowledged as being the thresholds for which people will walk to a bus stop or station.
	Ability to Unlock Growth	Strengthens the case to develop currently undeveloped land in the vicinity of the intervention proposed that would otherwise be inappropriate from a traffic and highways perspective, and/or helps to connect different areas of growth within the city.
Communities	Road Safety	Potential to reduce the number and severity of collisions upon implementation. This considers the safety of pedestrians and cyclists as well as general traffic.
	Protection of Green Spaces	Land comprising green space would remain at its current extent with the community value of these spaces potentially enhanced.
	Environment, Air Quality and Carbon	Contributes to the ambition of national and local policy objectives to mitigate against the adverse impacts of climate change. Implementation could have long term benefits to nature and to people's health.
	Quality of the Public Realm	Ability of the intervention to enhance the setting of key landmark features along the corridor, such as water courses, public art, streetscape and listed buildings.
	Severance	Produces an unwelcome disconnect between neighbouring places and spaces through the physical intrusion of hard engineering works which results in some form of metaphorical barrier that becomes more difficult to cross for various users.
Deliverability		
Physical	Engineering Constraints	The apparent difficulty of delivering a particular intervention in its proposed location due to level differences, land availability and competing infrastructure.
	Environmental Constraints	The apparent difficulty of delivering a particular intervention in its proposed location due to local sensitivities in the natural environment which can include impacts upon green spaces, water courses and habitats.

Area	Criteria	Rationale
Legal	Landownership	Considers the availability of land, the potential need to purchase land, the supportiveness of landowners, and the complexity of multiple landowners. Schemes score better when there are no land take requirements, land is under the control of the local authority, or where there is a commitment from a landowner to be supportive of any works.
	Planning	The extent to which the scheme is likely to require planning permission and the likelihood of planning permission being granted.
Support	Political / Public	The apparent difficulty of delivering a particular intervention in its proposed location due to local opposition from council members or the general public – including local residents and business owners.
	Stakeholders	The apparent difficulty of delivering a particular intervention in its proposed location due to local opposition from council members or the general public – including local residents and business owners.
Financial	Capital Costs	Provides an indicative high-level estimate in terms of the relative costs of the scheme options.
Phasing	Deliverable in the Short Term (0-5 years)	Indicates if a scheme can be implemented in the short term
	Deliverable in the Medium Term (5-10 years)	Indicates if a scheme can be implemented in the medium term.

4.3 Phasing

- 4.3.1 The overarching objectives of the commission are to develop improvements in the capacity and connectivity of sustainable transport to the east of Cambridge, together with benefits to local communities through a reduction in the impacts of travel through the area. Within this overall remit, there are two distinct time-based elements which have shaped the nature of the schemes taken forward and the packages within which they sit.
- 4.3.2 In the short term there is a requirement to improve the current transport offer along Newmarket Road. Relatively quick wins are required in the next five years to address the current inadequacies in provision and the lack of real travel choice for many, together with a need to kick start the economy following the impacts of the Covid-19 lockdown from March 2020.
- 4.3.3 In the medium term (5-10 years) there is the need to facilitate housing and jobs growth within the corridor, not least the opportunities presented in the emerging Greater Cambridge Local Plan. Potential measures should be free-standing but have the potential to form a pre-cursor to the implementation of the Cambridgeshire Autonomous Metro either as an initial, early deliverable of the CAM, or a complementary measure to support its operation once in place.
- 4.3.4 On this basis, it was determined which schemes should be taken forward, and if they should be considered as a short term or medium term measure, or both at the conclusion of the sifting process.

4.4 Results of the Assessment

- 4.4.1 The assessment of the Long List was based upon the qualitative judgement of a panel of transport experts from the public and private sectors. Each scheme was considered in terms of the extent to which it would make a major or minor positive or negative impact on the criteria, or if the impact would be neutral. Cost bandings were identified in terms of the high-level assessment of potential financial implications.
- 4.4.2 The results of the assessment determined that 38 schemes should be taken forward and 21 rejected, of the 59 schemes initially identified. In terms of phasing, it was concluded that 12 schemes should be considered in terms of Phase 1 interventions, 14 schemes should be considered as part of a second phase of measures, and a further 12 schemes should be considered for both.
- 4.4.3 The results of the assessment are summarised in [Table 4.2](#), whilst details of the scoring of each scheme against the criteria are provided in [Appendix A](#).

Table 4.2: Scoring of Long List Options

Ref.	Scheme Options
Pass	Phase 1
BL.05	New outbound bus lane between Elizabeth Way and the Leper Chapel.
BL.06	New tidal bus lane (or busway) between Elizabeth Way and the Leper Chapel.
BG.01	Bus Gate on Newmarket Road.
JC.03	Reconfiguration of the Newmarket Road and Coldham's Lane junction.
JC.04	Signalisation and reconfiguration of the Newmarket Road and Barnwell Road junction (higher capacity).
JC.05	Signalisation and reconfiguration of the Newmarket Road and Barnwell Road junction (lower capacity).
JC.06	Reconfiguration of the Newmarket Road and Ditton Lane junction (higher capacity).
JC.07	Reconfiguration of the Newmarket Road and Ditton Lane junction (lower capacity).
JC.09	Signalisation of the junction of Newmarket Road and Airport Way.
AT.01	Provision of continuous segregated inbound cycle lane along Newmarket Road.
AT.02	Provision of continuous segregated outbound cycle lane along Newmarket Road.
AT.03	Promotion of Park and Cycle from the P&R site.
Pass	Phase 2
BW.04	Online - between Park and Ride and A14.
BW.10	Offline (south) - between Brookfields and Coldham's Lane via a new bridge over the rail line.
BW.11	Offline (south) - between Coldham's Lane and P&R via Cambridge Airport (east of runway).
BS.02	New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
RA.02	Double track the Cambridge to Newmarket line.
RA.04	Provide new station at 'Cambridge East'.
RA.07	Provide a new Parkway Station at Six Mile Bottom.
RA.08	Provide a passing point near Fulbourn on the Cambridge to Newmarket line.
JC.08	Reconfiguration of A14 Junction 34 (with Ditton Lane) to remove slips.
JC.10	Signalisation and Reconfiguration of Quay Interchange.
HW.05	Carriageway widening along Coldham's Lane south of the airport, with a left turn filter lane for buses at the Sainsbury's roundabout.
AT.04	Provide a new shared use pedestrian/cycle bridge over the rail line and Coldham's Lane to link the existing 'Tins' cycle path with the airport site.
AT.06	Provide new cycle lanes along Coldham's Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
AT.07	Provide a new off-carriageway pedestrian-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.
Pass	Both
BW.02	Online - between Elizabeth Way Roundabout and Leper Chapel.
BL.02	Remove inbound bus lanes.
BL.03	Remove outbound bus lanes.
BS.01	Increase the frequency of existing P&R services.
BS.03	Provide new service from P&R to Addenbrooke's hospital and the Biomedical Campus.
PR.01	Expansion of current Park and Ride site.
PR.02	Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
BG.02	Bus Gate on Mill Road (at bridge over rail line).
JC.01	Reconfiguration of Elizabeth Way Roundabout, including the removal of the subway (higher capacity).
JC.02	Reconfiguration of Elizabeth Way Roundabout, including the removal of the subway (lower capacity).
HW.01	Additional lane(s) on Newmarket Road to east of Airport Way junction.
ITS.01	Reconfiguration of all signals to manage/control flow along Newmarket Road and wider network.



Ref.	Scheme Options
Rejected	
BW.01	Online - full length of Newmarket Road.
BW.03	Online - between Leper Chapel and Park and Ride.
BW.05	Offline (north) - between Leper Chapel and Quy Water via former rail line and High Ditch Road.
BW.06	Offline (north) - between Cambridge North Station and former rail line.
BW.07	Offline (south) - between Leper Chapel and Barnwell Road via Coldham's Common.
BW.08	Offline (south) - between Barnwell Road and P&R via Cambridge Airport (west of runway).
BW.09	Offline (south) - between East Road and Brookfields via Mill Road.
BW.12	Offline (south) – Coldham's Lane between Newmarket Road and south of runway.
BL.01	Extend inbound bus lanes to provide continuous link between P&R and city centre.
BL.04	Extend outbound bus lanes to provide continuous link between city centre and P&R.
BL.07	Conversion of the Cambridge to Newmarket rail line into a two-way bus lane.
PR.03	Relocation of Park and Ride to north of Quy Interchange (A14 Junction 35).
PR.04	New Park and Ride site to the north of Fen Ditton.
RA.01	Reinstate the Cambridge to Mildenhall Line.
RA.03	Realignment of the Cambridge to Newmarket line to the north of Cherry Hinton.
RA.05	Provide new station at Cherry Hinton.
RA.06	Provide new station at Barnwell.
HW.02	One way traffic on Newmarket Road, Coldham's Lane and Barnwell Road to form gyratory.
HW.03	Priority lane for Ultra Low Emission Vehicles only on Newmarket Road.
HW.04	Removal of two lanes (one inbound, one outbound) between Elizabeth Way and Coldham's Lane.
AT.05	Provide new dedicated cycle lanes along Brookfields / Mill Road.

4.5 Rejected Schemes

4.5.1 The majority of those schemes rejected at this stage were as a result of deliverability concerns, particularly environmental constraints such as loss of sensitive public open space, the physical ability to accommodate the schemes within a tight carriageway without significant disbenefits to many local residents, and the timeframe it would take to deliver major infrastructure – despite in some instances being very credible schemes in their own right.

4.5.2 Table 4.3 summarises the rationale behind the rejection of the 21 discounted options.

Table 4.3: Basis for the Rejected Long List Schemes

Ref.	Scheme Options	Rationale for Rejection
BW.01	Online - full length of Newmarket Road.	Providing a busway along large parts of Newmarket Road would be extremely difficult, or arguably, impossible given the road widths, severance, frontage access issues and mature trees. This would have to be at the expense of general traffic (which would be re-routed), footpaths and cycle lanes, and even residents' properties in some cases. It would also have a severing impact on the local community given the design requirements limiting crossing points. It was therefore concluded that in several respects the option would undermine the overarching objectives we are trying to achieve, whilst deliverability would also be extremely problematic and unpopular.
BW.03	Online - between Leper Chapel and Park and Ride.	Providing a busway along large parts of Newmarket Road would be extremely difficult given the land required (to the east of the Leper Chapel). This would have to be at the expense of general traffic (which would be re-routed), footpaths and cycle lanes, and even residents' properties in some cases. It would also have a severing impact on the local community given the design requirements limiting crossing points. It was therefore concluded that in several respects the option would undermine the overarching objectives we are trying to achieve, whilst deliverability would also be extremely problematic and unpopular.
BW.05	Offline (north) - between Leper Chapel and Quy Water via	Provides a relatively direct, segregated link into the city centre. The additional distance buses would have to travel on the alignment could be offset by the faster speed at which they could operate and the removal of buses from Newmarket Road would present an opportunity to prioritise provision for pedestrians and cyclists. However, there are concerns in terms of the

Ref.	Scheme Options	Rationale for Rejection
	former rail line and High Ditch Road.	additional mileage impacting upon bus operators' costs and that services would be removed from Newmarket Road, which could affect revenue. The ability to accommodate a new junction on Newmarket Road to the east of the Leper Chapel, the impact on the setting of the Chapel, on the alignment of the Chisholm Trail, and to the open space to the north of Barnwell together provide too many concerns to make this a suitable option.
BW.06	Offline (north) - between Cambridge North Station and former rail line.	This intervention has the potential to supplement other measures in terms of benefits to orbital movements and direct access to Cambridge North Station. It would also enable better connectivity between jobs and growth in the north and east of the city, and as such take pressure of capacity in the city centre. A bridge alignment adjacent to the existing could minimise the visual intrusiveness of the scheme, although the need to traverse the popular open space to the south of the river could be difficult to mitigate, particularly where the original track bed has been encroached upon.
BW.07	Offline (south) - between Leper Chapel and Barnwell Road via Coldham's Common.	Whilst this alignment could provide improved bus access to the Marshall's site, the impacts on Coldham's Common and the brook would be significant and detrimental. There is likely to be little public or political support and engineering difficulties in terms of managing the watercourse and providing a new junction on Newmarket Road would add further complications to delivery. Diversion of the Newmarket Road services via this route would add mileage and costs for the bus operator, and potentially could lose passengers who currently board on Newmarket Road.
BW.08	Offline (south) - between Barnwell Road and P&R via Cambridge Airport (west of runway).	The alignment would be such that it could serve both existing communities and new development on the Marshall's site, whilst the impact on the current network and key environmental assets would be minimal. However it would not be deliverable whilst the airport is operational as it would sever the airport buildings from the runway and as such could not be in place within the timescale required. Diversion of the Newmarket Road services via this route would add mileage and costs for the bus operator, and potentially could lose passengers who currently board on Newmarket Road.
BW.09	Offline (south) - between East Road and Brookfields via Mill Road	A busway along Mill Road would require extensive property acquisition and demolition, the removal of traffic and its re-routing within the wider network, restrictions on pedestrian and cycle access, and severance issues. It could be considered that this section of route is totally unsuitable for high frequency bus operation. The alignment between the lakes and bridging the rail line would add further complications to a scheme which would provide a very poor fit in terms of meeting the range of objectives required from investment in public transport in the east of the city. The provision of a busway on a single track, or operating in one direction would still fail to mitigate many of its drawbacks.
BW.12	Offline (south) – Coldham's Lane between Newmarket Road and south of runway.	The lack of carriageway width, impact on general traffic, particularly the complexity of movements associated with the retail park and the significant pinch points along Coldham's Lane, would make it extremely difficult to provide a busway along the corridor. In addition, the potential negative impacts it would have on the common, and walking and cycling movements make this an unpalatable option.
BL.01	Extend inbound bus lanes to provide continuous link between P&R and City Centre.	This is an excellent option in terms of the objectives of the study. However, there is not the width to deliver a continuous bus lane (in either direction) without significant compulsory purchase of properties and loss of pedestrian and cycle facilities along the corridor. Whilst less intrusive than a busway and having the ability to be used more flexibly in terms of permitted vehicles and hours of operation, a bus lane would require the widening of the carriageway, unless general traffic was prohibited completely.
BL.04	Extend outbound bus lanes to provide continuous link between City Centre and P&R.	There is not the width to deliver a continuous bus lane (in either direction) without significant compulsory purchase of properties and loss of pedestrian and cycle facilities along the corridor. Whilst less intrusive than a busway and having the ability to be used more flexibly in terms of permitted vehicles and hours of operation, a bus lane would require the widening of the carriageway, unless general traffic was prohibited. This could possibly accompany a Bus gate option on Newmarket Road.
BL.07	Conversion of the Cambridge to Newmarket Rail Line into a two-way bus lane.	The replacement of the rail line between Cambridge and Newmarket with a two way bus only link would provide fast and direct access into the city not only from Newmarket town centre but other towns and villages within the broad corridor, providing greater public transport connectivity. However, the scheme would see the rail link between Cambridge, Newmarket and the ports lost with huge implications for strategic public transport capacity and the ability to move freight sustainably. On this basis alone, it is considered inappropriate to take forward.
PR.03	Relocation of Park and Ride to north of Quy Interchange (A14 Junction 35).	Both in terms of the provision of the infrastructure and operation of the supporting services, the site would present problems. Located in the green belt it would have an impact on the environment and landscape. Perceptually it could be unappealing for users, in being cited further away from the city centre, and operationally there would be issues in terms of increased costs and travel times (including negotiating the Quy Interchange). Whilst it would intercept many vehicles sooner, those travelling from the south via Airport Way would have further to travel.
PR.04	New Park and Ride site to the north of Fen Ditton.	The site offers potential to support a northern route realignment and intercept traffic travelling towards the busy Ditton Lane junction with Newmarket Road, catering for traffic exiting the A14 at J34 and utilising existing service provision. However measures to be introduced as part

Ref.	Scheme Options	Rationale for Rejection
		of the Cambridge North to Waterbeach Study are likely to cater for any demand from further north in places such as Horningsea, and given the limitations on demand and impact of works on the Green Belt, it is not recommended that it is taken forward.
RA.01	Reinstate the Cambridge to Mildenhall Line.	The principle of reinstating a heavy rail link to serve large new developments in Mildenhall is undermined by the practical realities. Much of the original alignment has been sold and developed and the cost and timescales for delivery would be significant. There is also the danger that it could duplicate the service to be provided by CAM and compete for the same market of commuters, and damage areas of open space popular with local residents.
RA.03	Realignment of the Cambridge to Newmarket Line to the north of Cherry Hinton.	The realignment of the existing Cambridge - Newmarket line could generate significant benefits, for all modes of travel. Rail journey times and capacity would both benefit, as would the potential for the provision of East-West Rail in the future. At a more local level, the realignment would enable the removal of the level crossings which currently cause delays to general traffic and a safety concern for all road users. However the costs and timeframe to implement, the impact on Coldham's Common and the complex planning and legal requirements to be met make it an unrealistic proposition for taking forward within this study.
RA.05	Provide new station at Cherry Hinton.	Local growth and the lack of attractive alternative travel options for existing Cherry Hinton residents, could provide sufficient demand for the new station. Concerns persist with regards to the capacity of the current line to accommodate a level of service frequency that would make the station viable, but as part of a wider scheme which would see capacity enhancements, it could provide excellent strategic connectivity for the area. However, a train station at Cherry Hinton could not be justified in addition to a station at Cambridge East.
RA.06	Provide new station at Barnwell.	The station would be dependent on the Cambridge to Mildenhall line being reinstated to be considered a possible option (and this is unrealistic). However in its own right, the scheme has significant shortcomings, not least the impact on the open space in which it would be located, in terms of operational issues as a result of its proximity to Cambridge Station, and due to the lack of local growth opportunities and catchment it could serve.
HW.02	One way traffic on Newmarket Road, Coldham's Lane and Barnwell Road to form gyratory.	Whilst this could free up highway capacity for sustainable transport measures, it could see a large increase in vehicle miles and become an inconvenience for many, particularly local residents (as well as buses themselves). One way systems often see increases in vehicle speeds with the subsequent road safety connotations, and it is unlikely to be popular with the public or stakeholders, particularly the emergency services.
HW.03	Priority lane for Ultra Low Emission Vehicles only on Newmarket Road.	There is not the width to deliver a continuous ULEV lane (in either direction) without significant compulsory purchase of properties and loss of pedestrian and cycle facilities along the corridor. Whilst less intrusive than a busway and having the ability to be used more flexibly in terms of permitted vehicles and hours of operation, a ULEV lane would require the widening of the carriageway.
HW.04	Removal of two lanes (one inbound, one outbound) between Elizabeth Way and Coldham's Lane.	The removal of capacity for general traffic would provide scope for sustainable travel improvements and would be relatively straight forward in engineering terms. The question is, would the traffic just disappear with motorists switching to other modes, would it seek alternative routes, or would queues lengthen and delays increase. There is likely to be an element of all three, but as a result bus journey times are likely to suffer to the extent that the public realm and active travel benefits cannot be deemed to outweigh the impact.
AT.05	Provide new dedicated cycle lanes along Brookfields / Mill Road.	There is insufficient carriageway width to deliver segregated cycle lanes along Mill Road. In order to pass cyclists safely, vehicles would have to cross onto the other side of the carriageway creating a road safety risk. Vehicles could also end up queuing to overtake cyclists increasing the likelihood of delays, particularly for buses.

4.5.3 Whilst the above schemes have been discounted, it is not to suggest that they do not have merit in their own right. A number of the options could prove to be effective strategic interventions when considered within a city wide or sub-regional context.

4.5.4 Likewise, the removal of highway capacity between Elizabeth Way and Coldham's Lane could facilitate the transformation of the public realm and create an attractive gateway into the city. However, given the balance which has had to be struck between managing the movement and place functions of Newmarket Road, the decision was taken to reject the scheme at this stage. Such an option might be revisited in due course to complement the City Access Strategy.

4.6 Summary

4.6.1 A robust and transparent critique of the Long List has been undertaken which aligns with the requirements of the Transport Appraisal Process guidance issued by the DfT. An assessment framework was devised to be bespoke to the study area and as such draw out the most appropriate interventions which to take forward for more detailed consideration.



5 | Packaging of the Options

5.0 Packaging of the Options

5.1 Overview

- 5.1.1 Improving the capacity and connectivity of public transport along the Newmarket Road corridor and the surrounding area would not be achieved through the piecemeal implementation of individual measures. An integrated multi-modal package based approach is required to provide a step-change in the quality of provision, the journey experience and the travel choices available to all users.
- 5.1.2 Such an approach also reflects the complexities of the network, and the need for comprehensive route treatment. The current sustainable transport offer along Newmarket Road highlights the shortcomings of incremental investment. The packaging of the short-listed options will avoid such pitfalls.
- 5.1.3 Within this context, there are two distinct requirements to make the sustainable transport offer fit for purpose. Firstly, immediate improvements are required to the operation of Newmarket Road and as such alternative short-term 'Phase 1' packages have been identified.
- 5.1.4 These will be complemented by more medium-term improvements through which to open up growth opportunities to the east of Cambridge, with alternative 'Phase 2' packages detailed herein which would build upon the short-term interventions.

5.2 Phase 1 (Short Term) Packages

- 5.2.1 Two distinct packages were identified through which improvements to sustainable transport could be achieved along Newmarket Road in the short term, considered to be the next five years. These consisted of:

Package 1.1: Newmarket Road Intelligent Traffic Management

- 5.2.2 This forms a light touch approach to maximise the efficiency with which buses can operate along Newmarket Road based upon the management of traffic flow via sensors in the road to detect queuing and signal timings to respond accordingly.
- 5.2.3 The technology will hold traffic back at strategic junctions on all major roads feeding into Newmarket Road so that at no point are there excess vehicles to cause delays to buses downstream. The buses themselves will be given priority at the junctions with Selective Vehicle Detection (SVD) technology designed to give them a 'green wave' along the corridor.
- 5.2.4 This will require the reconfiguration of all junctions and their signalisation, with traffic 'held' on approaches away from residential areas. As traffic can't be held back within the city centre for outbound movements, bus priority measures will be 'switched' to cater for eastbound services. All works will be deliverable within the existing highway boundary.
- 5.2.5 It is felt that the package would make more effective use of the existing road space, see journey time benefits for buses, remove the need for dedicated bus lanes allowing space to be reallocated to pedestrians and cyclists, and improve safety and reduce severance at major junctions. The schemes contained within this package are detailed in [Table 5.1](#) and illustrated in [Figure 5.1](#).

Table 5.1: Package 1.1 Component Schemes

Ref	Schemes
ITS.01	Reconfiguration of all signals to manage/control flow along Newmarket Road & wider network.
PR.01	Expansion of current Park and Ride site.
JC.01	Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (higher capacity).
JC.03	Reconfiguration of the Newmarket Road & Coldham's Lane junction.
JC.04	Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (higher capacity).

Ref	Schemes
JC.06	Reconfiguration of the Newmarket Road & Ditton Lane junction (higher capacity).
JC.09	Signalisation of the junction of Newmarket Road and Airport Way.
JC.10	Signalisation and Reconfiguration of Quy Interchange
BL.02	Remove inbound bus lanes.
BL.05	New outbound bus lanes between Elizabeth Way and the Leper Chapel.
AT.01	Provision of continuous segregated inbound cycle lane along Newmarket Road.
AT.02	Provision of continuous segregated outbound cycle lane along Newmarket Road.
AT.03	Promotion of Park and Cycle from the P&R site.

Package 1.2: Newmarket Road Intelligent Traffic Management

- 5.2.6 This approach builds upon Package 1.1 by providing a greater degree of physical intervention to support the technology and management of traffic flow along Newmarket Road.
- 5.2.7 The new infrastructure will see more significant changes made to key junctions in the corridor and the surrounding network, the relocation of the existing Park and Ride site to an extended location more suitable to intercepting vehicles before they enter the city, and an additional lane for general traffic between Airport Way and the Quy Interchange to accommodate queuing traffic.
- 5.2.8 The package has the potential to further reduce the dominance of traffic on Newmarket Road with the closure of A14 J34 and reconfiguration of other major junctions creating a safer and more sustainable transport corridor, and more convivial and civilised public realm. The schemes contained within this package are detailed in [Table 5.2](#) and illustrated in [Figure 5.2](#).

Table 5.2: Package 1.2 Component Schemes

Ref	Schemes
ITS.01	Reconfiguration of all signals to manage/control flow along Newmarket Road & wider network.
HW.01	Additional lane(s) on Newmarket Road to east of Airport Way junction.
JC.02	Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (lower capacity).
JC.03	Reconfiguration of the Newmarket Road & Coldham's Lane junction.
JC.05	Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (lower capacity).
JC.07	Reconfiguration of the Newmarket Road & Ditton Lane junction (lower capacity).
JC.08	Reconfiguration of A14 Junction 34 (with Ditton Lane) to remove slips.
JC.09	Signalisation of the junction of Newmarket Road and Airport Way.
JC.10	Signalisation and Reconfiguration of Quy Interchange
BL.02	Remove inbound bus lanes.
BL.05	New outbound bus lanes between Elizabeth Way and the Leper Chapel.
PR.02	Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
AT.01	Provision of continuous segregated inbound cycle lane along Newmarket Road.
AT.02	Provision of continuous segregated outbound cycle lane along Newmarket Road.
AT.03	Promotion of Park and Cycle from the P&R site.

5.3 Phase 2 (Medium Term) Packages

- 5.3.1 In terms of measures to be delivered within the medium term as a pre-cursor to the opening of the CAM and in seeking to maximise housing and economic development opportunities within the east of the city, a further three packages were identified, two bus-based and a third rail based.

Package 2.1: Southern Busway (via Coldham's Lane and Brooks Road)

- 5.3.2 The provision of a continuous busway from a new Park and Ride facility, to the east of Airport Way, through the current airport site to Coldham's Lane would provide a fast and unhindered link to the edge of the urban area. From here buses would utilise Coldham's Lane and Brooks Road to connect into Mill Road, a destination in its own right, and travel inbound to the city centre.
- 5.3.3 This new corridor would open up the airport site for possible redevelopment and, located to the east of the current runway, could be delivered whilst the airport is still operational. The package is future proofed in that in the longer term it could form part of the eastern arm of the Cambridgeshire Autonomous Metro.
- 5.3.4 A bus gate on Mill Road would reduce the volume of general traffic on Mill Road freeing up capacity for bus service provision whilst complementary cycle infrastructure improvements would also help in increasing the connectivity of the airport site by sustainable modes. The schemes contained within this package are detailed in [Table 5.3](#) and illustrated in [Figure 5.3](#).

Table 5.3: Package 2.1 Component Schemes

Ref	Schemes
BW.04	Online - between Park and Ride and A14.
HW.05	Carriageway widening along Coldham's Lane south of the airport, with a left turn filter lane for buses at the Sainsbury's roundabout.
BW.11	Offline (south) - between Coldham's Lane and P&R via Cambridge Airport (east of runway).
BG.02	Bus Gate on Mill Road (at bridge over rail line).
BS.02	New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
PR.02	Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
AT.04	Provide a new foot-cycle bridge(s) over the rail line and Coldham's Lane to link the existing Tins cycle path with the airport site.
AT.06	Provide new cycle lanes along Coldham's Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
AT.07	Provide a new off-carriageway foot-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.

Package 2.2: Southern Busway (via Bridge over Rail Line)

- 5.3.5 Differs from Package 2.1 through the provision of a bridge from the south of the airport site, spanning Coldham's Lane and the Cambridge to Newmarket rail line, before running along the Tins between the two lagoons and joining Mill Road via Brookfields.
- 5.3.6 Whilst a more expensive option than Package 2.1, it would provide a more direct connection into Mill Road and then on to the station and the city centre. The bridge could be converted into a pedestrian and cycle link as and when the Cambridgeshire Autonomous Metro becomes operational. The schemes contained within this package are detailed in [Table 5.4](#) and illustrated in [Figure 5.4](#).

Table 5.4: Package 2.2 Component Schemes

Ref	Schemes
BW.04	Online - between Park and Ride and A14.
BW.10	Offline (south) - between Brookfields and Coldham's Lane via a new bridge over the rail line.
BW.11	Offline (south) - between Coldham's Lane and P&R via Cambridge Airport (east of runway).
BG.02	Bus Gate on Mill Road (at bridge over rail line).
BS.02	New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
PR.02	Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
AT.04	Provide a new foot-cycle bridge(s) over the rail line and Coldham's Lane to link the existing Tins cycle path with the airport site.
AT.06	Provide new cycle lanes along Coldham's Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
AT.07	Provide a new off-carriageway foot-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.

Package 2.3: Rail

- 5.3.7 Provides a step change in rail capacity to the east of the city through the double tracking of the line between Cambridge and Newmarket, coupled with the provision of new stations at a site to serve the southern edge of the airport site, 'Cambridge East', and in the Six Mile Bottom area which could serve development aspirations in that part of South Cambridgeshire and also operate as a Parkway Station given its proximity to the A11 and A14.
- 5.3.8 This package provides potential benefits above and beyond this study. The enhancements would seek to reflect the wider aspirations of the East-West Rail Consortium to improve the capacity and connectivity of rail service between the Haven ports, Ipswich, Cambridge and beyond. That said, the benefits that might be delivered by the package would be limited because of constrained capacity in Cambridge station the alignment traversing Coldham's Common and the multiple level crossings in Cherry Hinton and Fulbourn.
- 5.3.9 The schemes contained within this package are detailed in [Table 5.5](#) and illustrated in [Figure 5.5](#).

Table 5.5: Package 2.3 Component Schemes

Ref	Schemes
	As Package 2.2 plus:
RA.02	Double track the Cambridge to Newmarket Line.
RA.04	Provide new station at 'Cambridge East'.
RA.07	Provide a new Parkway Station at Six Mile Bottom

5.4 Omitted Schemes

- 5.4.1 Despite being considered suitable for delivery in either the short term or medium term, several of the short-listed options were not included in any of the packages to be modelled. The explanation for each of these omissions is contained within [Table 5.6](#).

Table 5.6: Rationale for Omission of Short-Listed Schemes

Intervention	Ref	Scheme	Rationale
Busway	BW.02	Online - between Elizabeth Way Roundabout and Leper Chapel.	- Use of ITS would in many ways negate the need for dedicated lanes for buses enabling the road space to be used more efficiently and where possible reallocated to pedestrians and cyclists. - Such a short section of busway would not provide strategic benefits if implemented in isolation and not form part of a corridor length scheme.
Bus Lanes	BL.05	New outbound bus lane between Elizabeth Way and the Leper Chapel.	Use of ITS would in many ways negate the need for dedicated lanes for buses enabling the road space to be used more efficiently and where possible reallocated to pedestrians and cyclists.
Bus Lanes	BL.06	New tidal bus lane (or busway) between Elizabeth Way and the Leper Chapel.	Use of ITS would in many ways negate the need for dedicated lanes for buses enabling the road space to be used more efficiently and where possible reallocated to pedestrians and cyclists.
Bus Gate	BG.01	Bus Gate on Newmarket Road.	An effective Intelligent Traffic Management System would negate the need for a bus gate and provide a more nuanced approach to the management of general traffic flows.
Rail	RA.08	Provide a passing point near Fulbourn on the Cambridge to Newmarket Line.	A passing point would provide an incremental approach in providing more rail capacity. However, it was felt that an intervention which could provide greater strategic benefit in the long term (double tracking) would present a more comprehensive approach. The use of passing loops so close to Cambridge station where there is a high risk of delay can lead to significant downstream delay.



5.5 Summary

- 5.5.1 The packaging process has enabled the identification of alternative approaches to meet the short-term needs of the Newmarket Road corridor and the longer term requirement to provide the capacity and connectivity to facilitate housing and economic growth in the city.
- 5.5.2 Whilst there are a multitude of permutations and combinations of schemes which could be assessed in more detail, those identified provide distinctly different approaches within the confines of a heavily urbanised study area.

KEY

- Indicative CAM alignment
- Major development sites
- P+ PR.01 Expansion of current Park and Ride site
- ITS.01- Reconfiguration of all signals to manage/control flow along Newmarket Road & wider network.
BL.02 - Remove inbound bus lanes.
BL.05 - New outbound bus lanes between Elizabeth Way and the Leper Chapel.
- JC.01 - Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (higher capacity).
- JC.03 - Reconfiguration of the Newmarket Road & Coldhams Lane junction.
- JC.04 - Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (higher capacity).
- JC.06 - Reconfiguration of the Newmarket Road & Ditton Lane junction (higher capacity).
- JC.09 - Signalisation of the junction of Newmarket Road and Airport Way.
- JC.10 - Signalisation and Reconfiguration of Quay Interchange
- AT.01 & AT.02 - Provision of continuous segregated inbound & outbound cycle lane along Newmarket Road.

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Figure 5.1: Package 1.1 Intelligent Traffic Management

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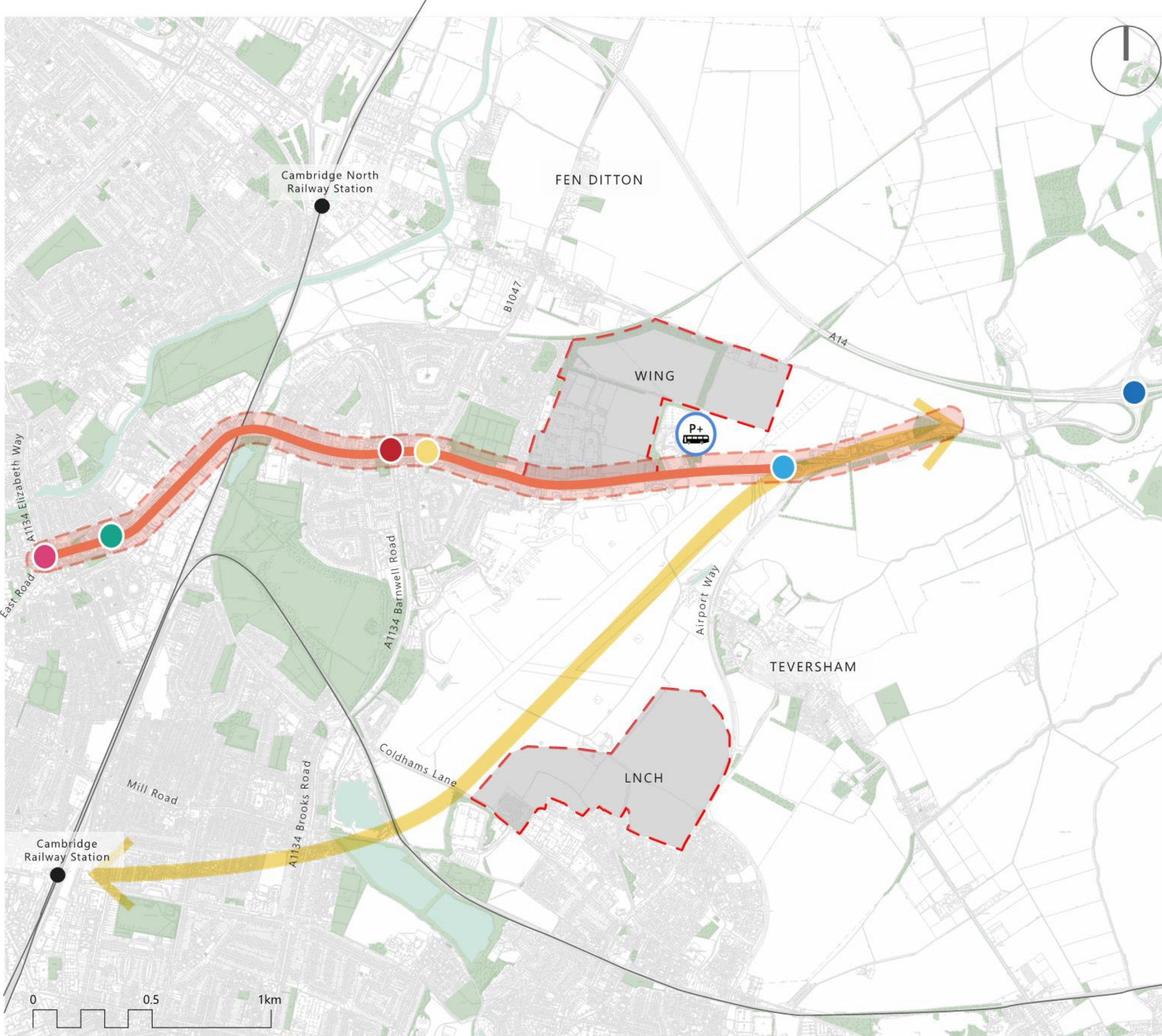
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KEY

- Indicative CAM alignment
- Major development sites
- P+ PR.02 - Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
- ITS.01- Reconfiguration of all signals to manage/control flow along Newmarket Road & wider network.
BL.02 - Remove inbound bus lanes.
BL.05 - New outbound bus lanes between Elizabeth Way and the Leper Chapel.
- HW.01 - Additional lane(s) on Newmarket Road to east of Airport Way junction.
- JC.02 -Reconfiguration of Elizabeth Way Roundabout, including the removal of Subway (lower capacity).
- JC.03 - Reconfiguration of the Newmarket Road & Coldhams Lane junction.
- JC.05 - Signalisation and reconfiguration of the Newmarket Road & Barnwell Road junction (lower capacity).
- JC.07 - Reconfiguration of the Newmarket Road & Ditton Lane junction (lower capacity).
- JC.08 - Reconfiguration of A14 Junction 34 (with Ditton Lane) to remove slips.
- JC.09 - Signalisation of the junction of Newmarket Road and Airport Way.
- JC.10 - Signalisation and Reconfiguration of Quay Interchange
- AT.01 & AT.02 - Provision of continuous segregated inbound & outbound cycle lane along Newmarket Road.

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Figure 5.2: Package 1.2 Intelligent Traffic Management

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KEY

-  Indicative CAM alignment
-  Major development sites
-  PR.02 - Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
-  BG.02 - Bus Gate on Mill Road (at bridge over rail line).
-  BW.04 - Online - between Park and Ride and A14.
-  BW.11 - Offline (south) - between Coldhams Lane and P&R via Marshall's Airport (east of runway).
-  BS.02 - New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
-  AT.04 - Provide a new foot-cycle bridge(s) over the rail line and Coldhams Lane to link the existing Tins Cyclepath with the airport site.
-  AT.06 - Provide new cycle lanes along Coldhams Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
-  AT.07 - Provide a new off-carriageway foot-cycle link from the airport site to connect into the Chisholm Trail via Barnwell Road and Coldham's Common.
-  BW.10 - Offline (south) - between Brookfields and Coldhams Lane via a new bridge over the rail line.

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Figure 5.3: Package 2.1 Southern Busway (via Coldham's Lane and Brooks Road)

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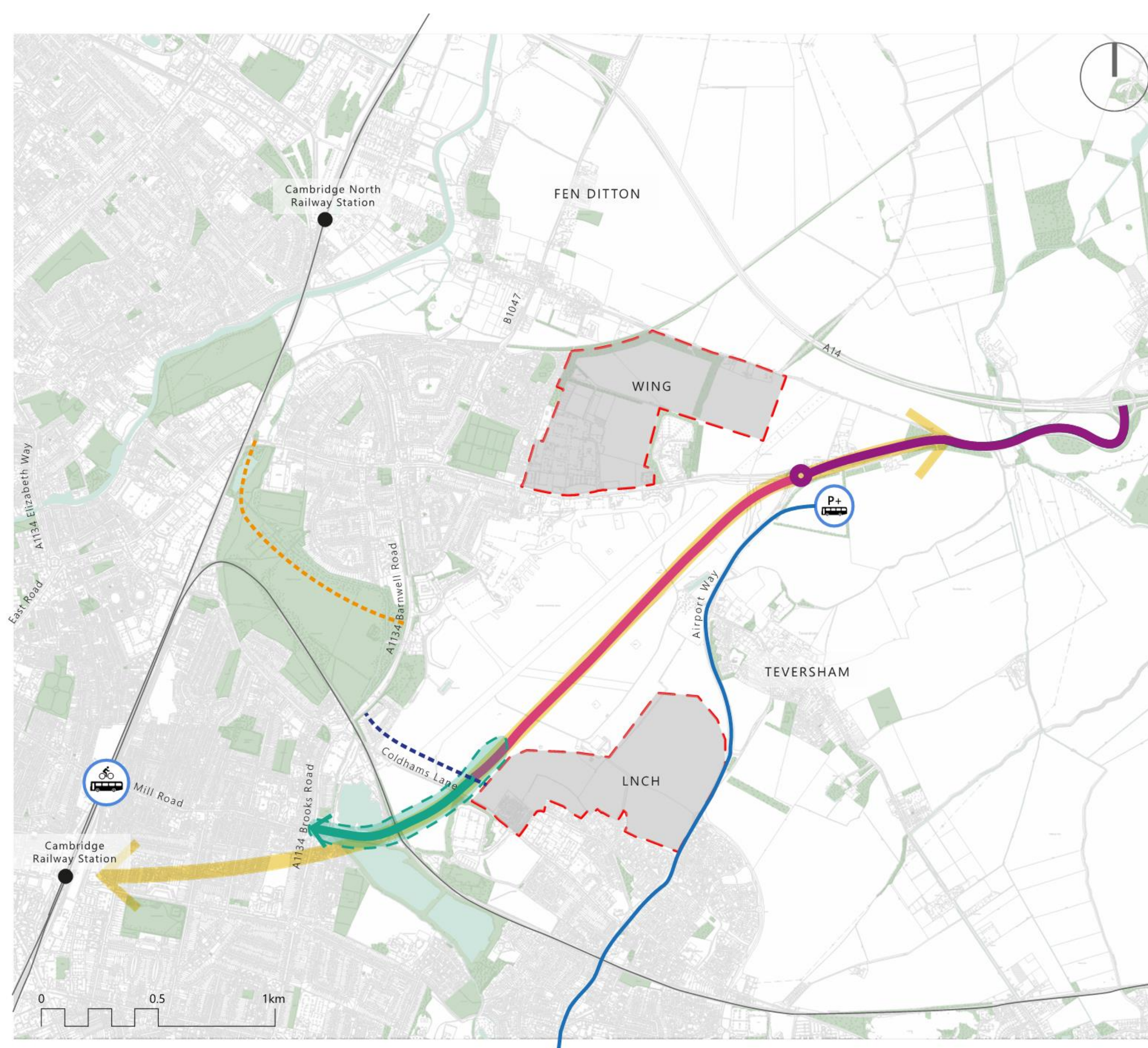
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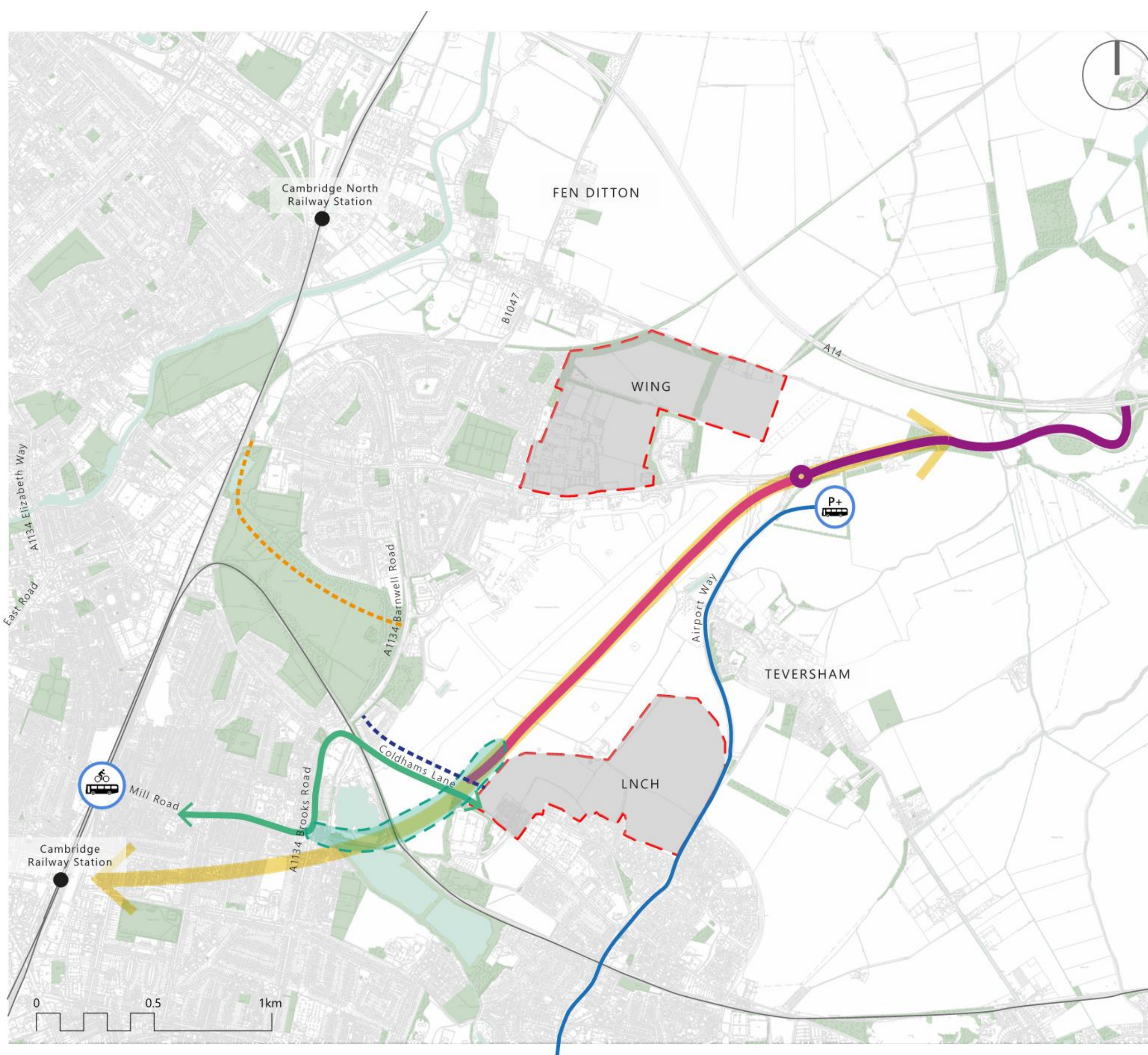
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- KEY**
- Indicative CAM alignment
 - Major development sites
 - P+ PR.02 - Relocation of Park and Ride to south of Newmarket Road and east of Airport Way.
 - BG BG.02 - Bus Gate on Mill Road (at bridge over rail line).
 - BW.04 - Online - between Park and Ride and A14.
 - BW.11 - Offline (south) - between Coldhams Lane and P&R via Marshall's Airport (east of runway).
 - BS.02 - New bus service between the station, Mill Road, Cambridge East and the Park and Ride.
 - AT.04 - Provide a new foot-cycle bridge(s) over the rail line and Coldhams Lane to link the existing Tins Cyclepath with the airport site.
 - AT.06 - Provide new cycle lanes along Coldhams Lane between the airport site and the Sainsbury's roundabout and enhance existing cycle provision along Brooks Road.
 - AT.07 - Provide a new off-carriageway foot-cycle link from the airport site to connect into the Chisholm Trial via Barnwell Road and Coldham's Common.
 - HW.05 - Carriageway widening along Colhams Lane south of the airport, with a left turn fileter lane for buses at the Sainsbury's roundabout.

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Figure 5.4: Package 2.2 Southern Busway (via Bridge over Rail Line)

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KEY

-  Indicative CAM alignment
-  Major development sites
-  RA.02 - Double track the Cambridge to Newmarket Line.
-  RA.04 - Provide new station at 'Cambridge East'.
-  RA.07 - Provide a new Parkway Station at Six Mile Bottom



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Figure 5.5: Package 2.3 Rail

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6 | Next Steps

6.0 Next Steps

- 6.1.1 Following the identification of the packages, they will now be taken forward for assessment within the Cambridge Paramics Model, in line with the approach detailed within the Appraisal Specification Report.
- 6.1.2 The subsequent findings of the assessment will accompany an eight-week period of formal consultation between October and December 2020, following which a Strategic Outline Business Case will be produced.

