Cambourne Growth Strategy Programme

Cambourne Growth - Transport Vision and Principles

Report

Arup

Final - 15th September 2025

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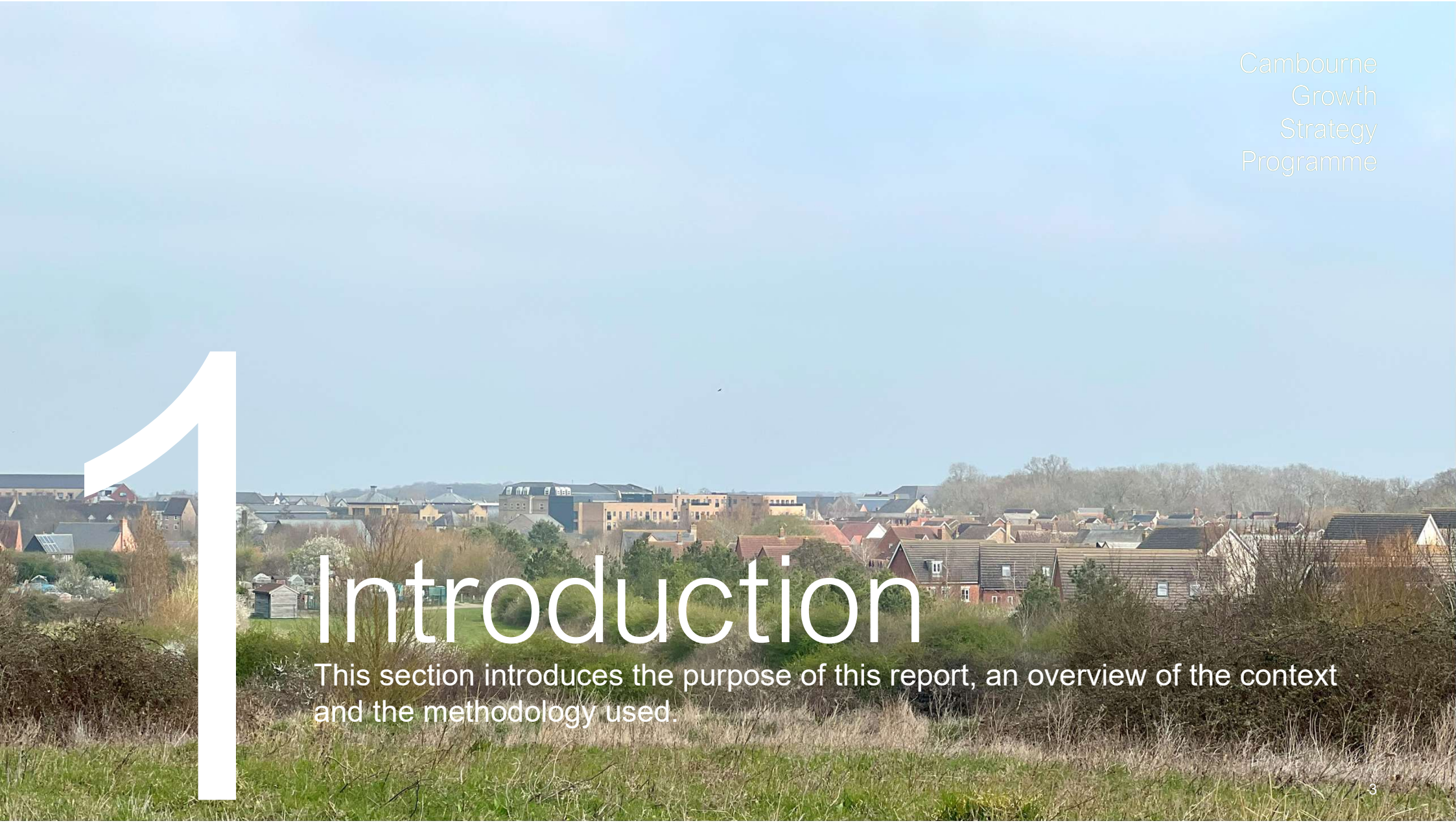


1 Introduction

This section introduces the purpose of this report, an overview of the context and the methodology used.

1.1 Purpose of this report

This report summarises the transport planning work to date for the Cambourne Growth Strategy commission informing the development of a Spatial Framework Strategy for the extension of Cambourne

The Cambourne Growth Strategy Consortium has been appointed by GCSP to consider the spatial options available to extend existing Cambourne and to develop a Spatial Framework Strategy that will inform how an expansion of Cambourne should be considered as part of the Greater Cambridge Local Plan (GCLP).

Planning for the future of Cambourne must take account of the needs of the existing town and communities; a level of development which is sustainable and responds to the housing needs of Greater Cambridge; and an approach to development which is deliverable and addresses complex site constraints.

The intention of this report is to set out how transport, movement and mobility will play a key role in maximising the potential of Extended Cambourne to meet the needs and requirements of Cambridge to deliver new homes, jobs and other needs whilst making the most of new infrastructure being delivered in the form of East West Rail (EWR) and Cambourne to Cambridge (CtoC) Busway.

Stakeholder Engagement

As part of this work, the Arup transport team attended engagement workshops which have been held to collaboratively discuss Cambourne's future with a range of stakeholders. This allowed us to ensure that the Spatial Framework strongly reflects the importance of planning the transport network early and incorporating vision-led thinking.

Existing Cambourne

The reports seeks to set out the baseline information to provide a detailed understanding of transport network provision and existing movement patterns across Cambourne.

Vision and Design Principles

This understanding has allowed us to develop the vision and transport design principles to tailor to the unique characteristics of Cambourne. Using our Total Design approach and working closely with the wider programme team, we have established best practice design principles to ensure that land use and transport planning are integrated from the start, embedding sustainability throughout.

Travel Demand

Using our in-house travel demand model, described in more detail in Section 4, we have undertaken an assessment of the likely travel demand from the development based on the scale, density and number of homes and jobs proposed, also supported by retail and social infrastructure. This consideration of likely travel demand across different modes has allowed us the technical rigor to advise the framework.

Regional and Local Connectivity

We have investigated the likely number and nature of crossings over the Strategic Road Network and planned EWR alignment, as well as developing networks of movement across Active Travel, Public Transport and Highways.

Phasing and Resilience

All the proposals come with some degree of uncertainty. We are seeking to demonstrate through the Spatial Framework Strategy that we have considered how future phasing may work to respond to uncertainty to ensure that movement networks are flexible, adaptable and future-proofed, with early delivery of walking and cycling networks to embed sustainable travel behaviours from the outset.

1.2 Background

Transport Modelling Prior to this study

The Cambridge Sub Regional Model (CSRM) has been used as the strategic modelling tool for transport planning in Greater Cambridge, including assessments to inform the Greater Cambridge Local Plan and major infrastructure schemes.

Prior model runs incorporated assumptions for a major expansion at Cambourne, including:

- 20,000 homes and 20,000 jobs
- Four neighbourhoods, two with town centre-scale facilities
- Planned infrastructure: East West Rail station at Cambourne, extension of Cambourne-Cambridge Busway (CtoC), active travel provision, and surrounding highway upgrades

This modelling work provided a high-level assessment of strategic transport implications and helped define broad development capacity and infrastructure requirements. However, the strategic modelling exercise:

- Did not explore design principles or delivery phasing
- Assumed generic trip rates and patterns, not tailored to Cambourne's unique characteristics or vision-led planning

The current study builds on these assumptions, using a more place-based approach to:

- Shape the Spatial Framework
- Align transport planning with land use design
- Support long-term modal shift objectives

This report forms part of the transport evidence for Cambourne, complementing the Busway Integration Study and other technical studies by focusing specifically on how transport planning principles, vision and design can be embedded within the emerging Spatial Framework Strategy.

2 Existing Cambourne

This chapter covers the baseline inputs and key considerations relating to delivering an extension around Cambourne.

2.1 Study Area

Study area surrounding Cambourne

The Area of Study sets the extent of land to be considered as part of technical evidence gathering and identification of spatial options through the Cambourne Growth Strategy Programme.

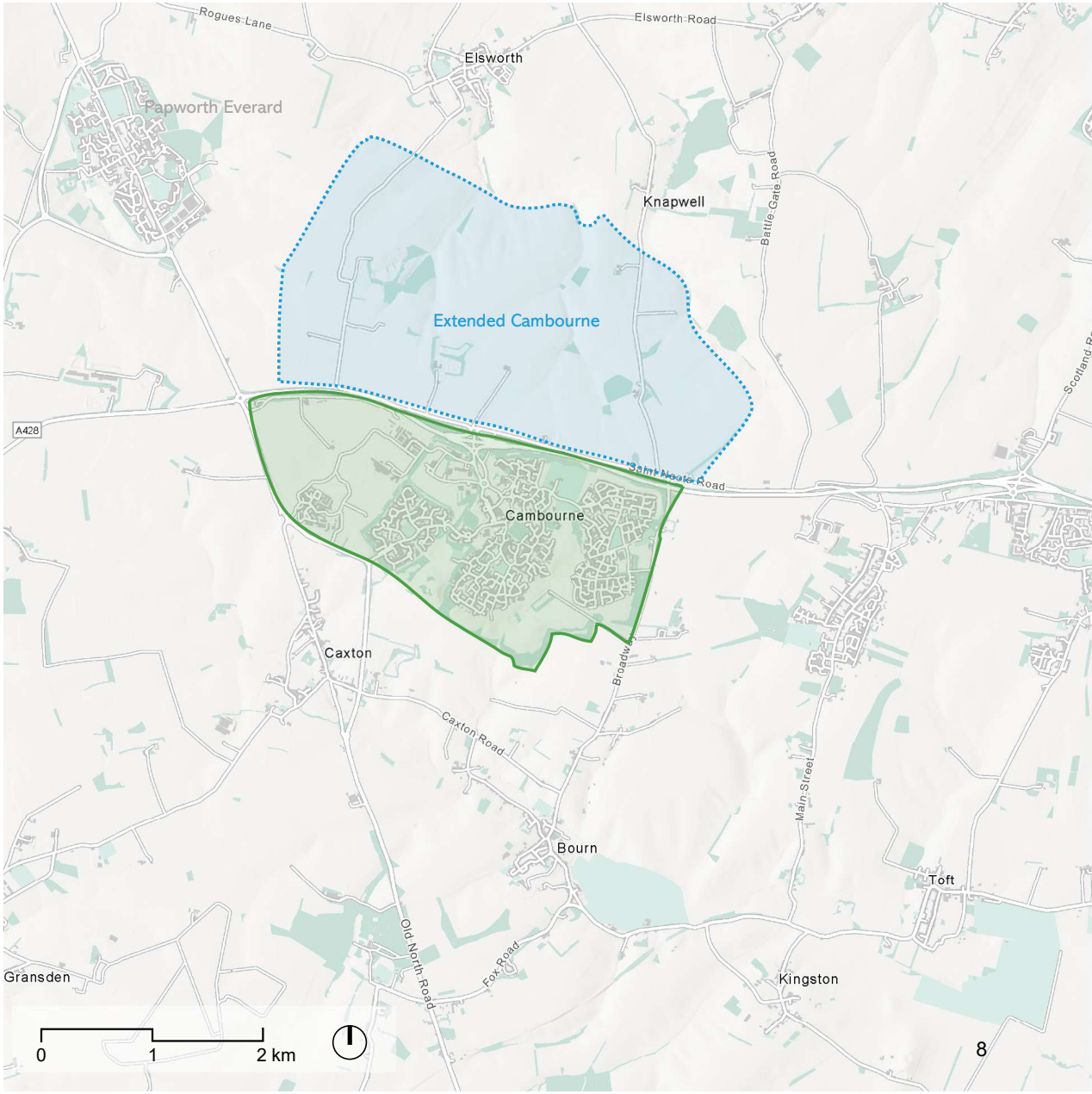
An Area of Study of 10 kilometres by 10 kilometres centred around the existing town of Cambourne was identified in the early stages of the commission. These distances were chosen in response to the scope of the project (to consider the shape and size of an expansion to Cambourne), the need for any expansion to be underpinned by the use of sustainable transport modes, and site-specific spatial patterns.

The distances enable a full consideration of environmental and other factors effecting Cambourne, surrounding villages and rural areas. The distances also allow a range of different spatial options to be considered for growth of the existing settlement.

2.2 Population and Demographics

Context

- The current population of Cambourne is estimated at 12,400 residents (ONS, 2022), made up of 4,400 households (ONS, 2021), making it the largest settlement in South Cambridgeshire. The town continues to grow as new housing is delivered.
- Cambourne saw particularly high population growth between 2011 and 2021 with an increase of 3,540 residents, a growth of 43% over the decade. The number of households in the ward increased by 1,190 during this period. The average household size in Cambourne also increased slightly, from 2.77 persons per household in the 2011 Census to 2.82 persons per household in the 2021 Census.
- Cambourne has a relatively young population profile compared to South Cambridgeshire and the national average. At the time of the 2021 Census:
  - 27.5% of the population were aged 0–15, (19.9% in South Cambridgeshire, 18.7% across England).
  - 59.6% were aged 16–64, (60.3% in South Cambridgeshire, 62.3% across England).
  - 12.9% were aged 65 and over, (19.8% in South Cambridgeshire, 18.4% across England).
- This reflects the area's recent growth. As the development matures, the age profile would be expected to align more closely with wider district averages.



2.3 Movement patterns

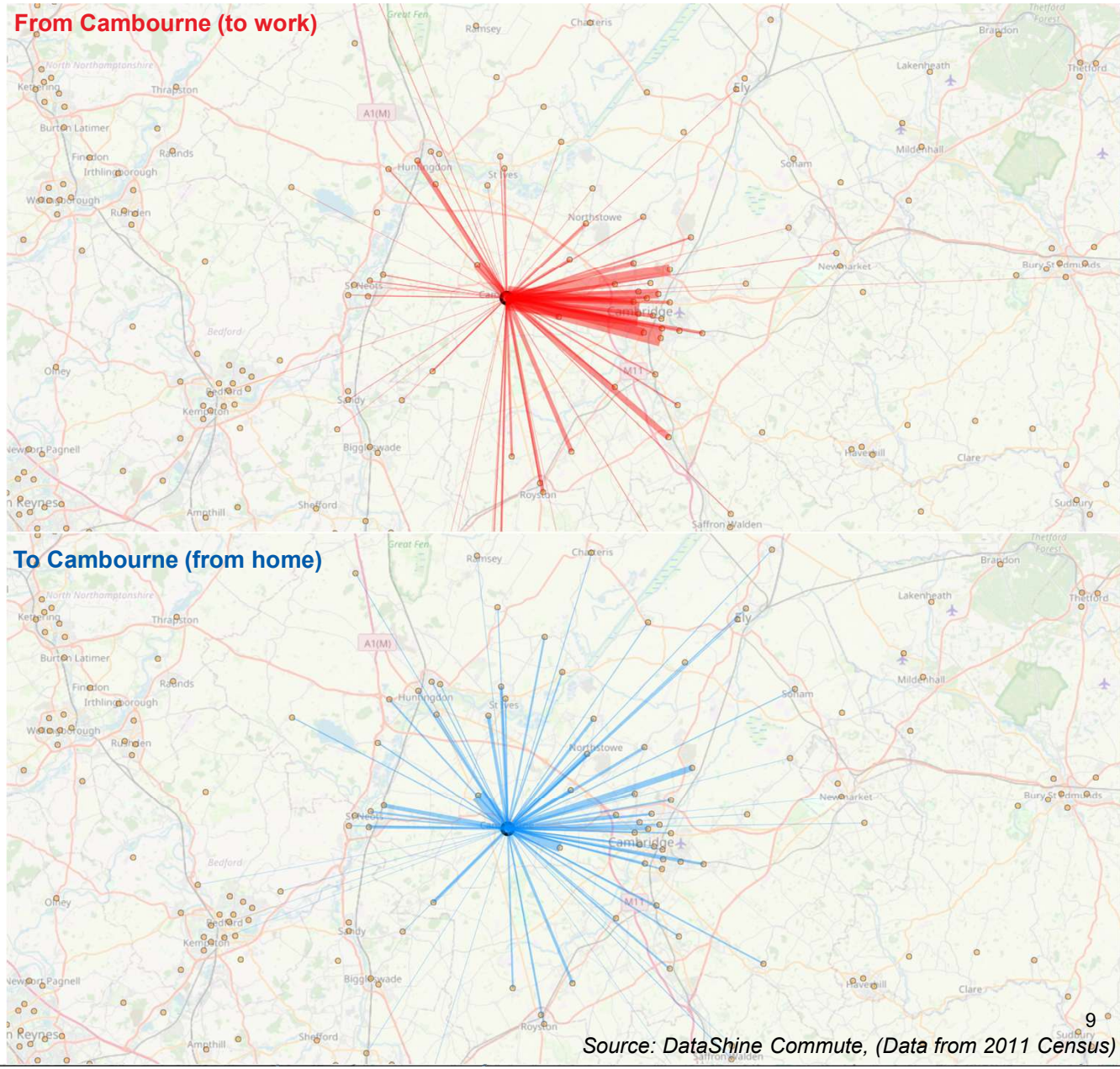
Journeys to work

Top in/out commuting locations to/from existing Cambourne are highlighted based on Census travel to work data (2011) including:

- Cambridge
- Areas north and south of Cambridge
- Huntingdon and St Ives
- St Neots
- Sandy
- Bedford

Other areas of note:

- Saffron Waldon
- Bishops Stortford
- Royston
- City of London



Source: DataShine Commute, (Data from 2011 Census)

2.4 Active travel

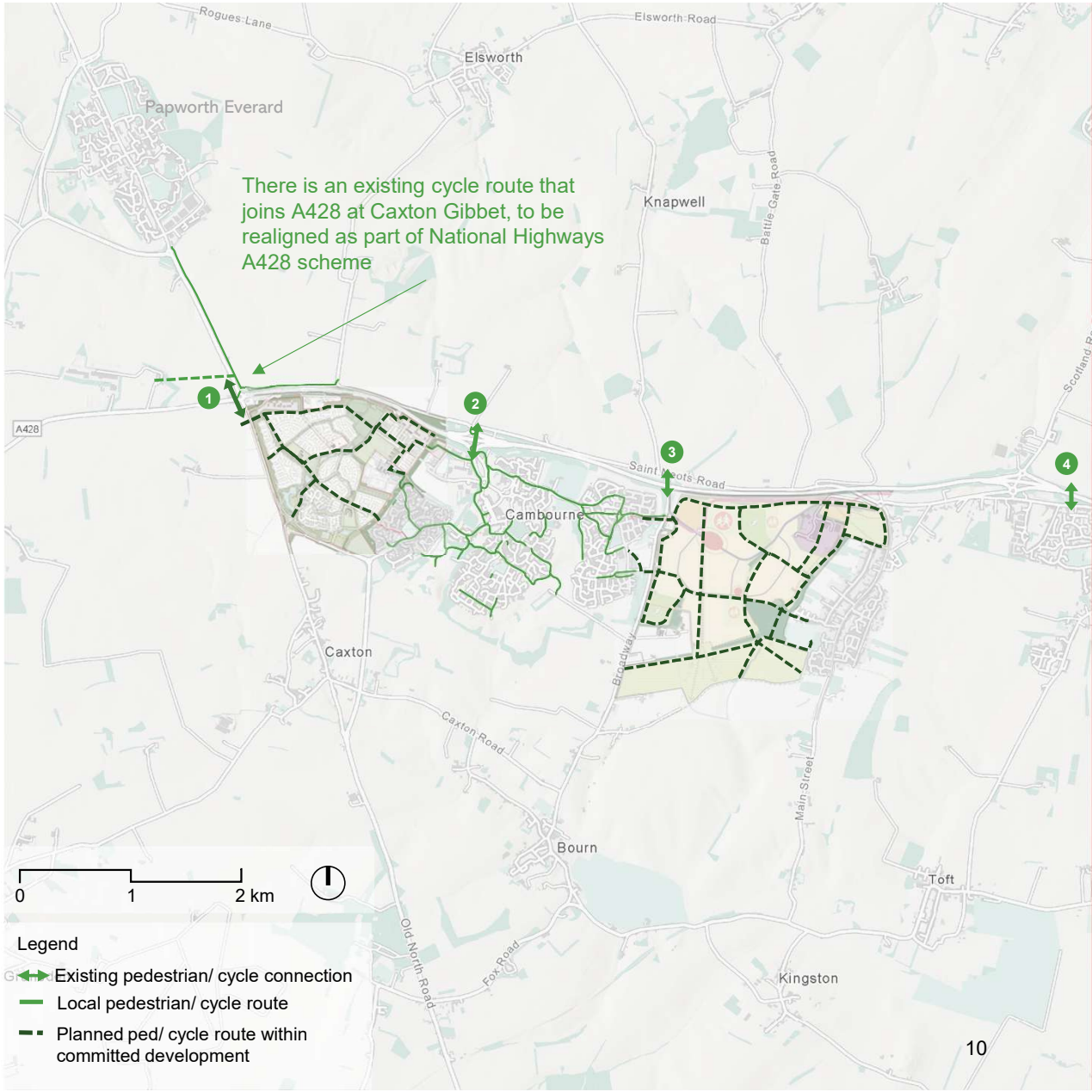
Current network

Whilst routes cover most of existing Cambourne, the majority are shared pedestrian and cycle paths that are not suitable for a high volume of trips. These routes are often incomplete, lack consistent width, and are interrupted by frequent side road crossings or informal connections. They do not necessarily follow key desire lines and can feel indirect or disjointed, particularly for longer or strategic journeys. This limits their effectiveness as a usable, high-quality active travel network.

More extensive active travel routes have been planned in Cambourne West and Bourn Airfield committed developments.

There are 4 active travel crossings of the A428 in our study area:

1. The crossing at Caxton Gibbet junction which is currently being upgraded as part of National Highways A428 scheme and will provide segregated N-S and E-W connections. Due for completion in 2027.
2. Pedestrian/ cycle crossing over A428 along Cambourne Road, ends at St Neots Road.
3. Pedestrian crossing over A428 along Broadway, ends at St Neots Road. This crossing is inconsistent with a fragmented footway and no barrier between pedestrians and vehicles.
4. Pedestrian and cycle bridge over A428. This crossing connects well with the surrounding walking and cycling routes but is far from existing and extended Cambourne and has no natural surveillance which may affect feelings of safety, especially after dark.



2.5 Public transport

Bus

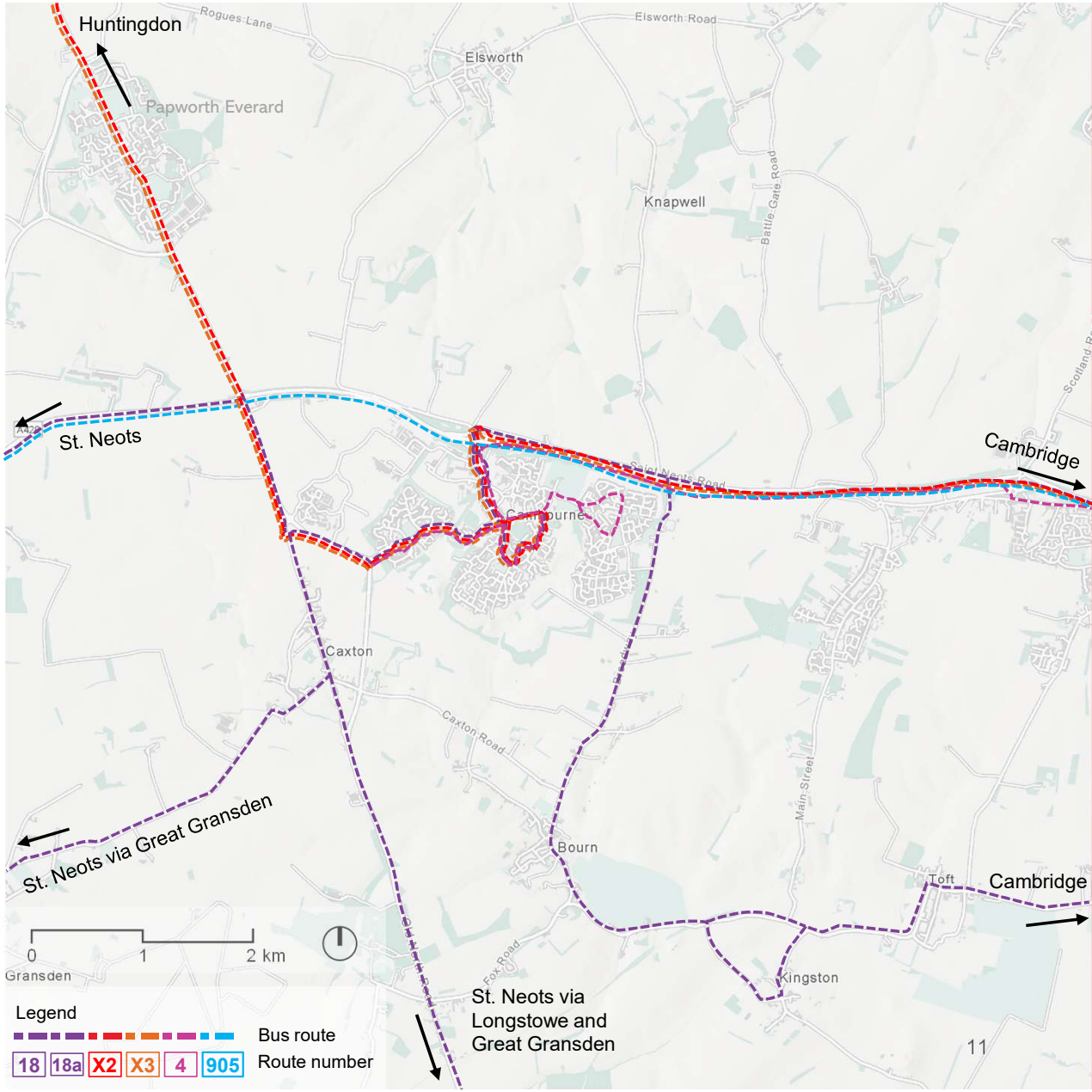
- Cambourne is currently served by five bus routes:
  - 18, 18a, X2 and X3 are operated by Whippet Bus
  - 4 and 905 are operated by Stagecoach East
  - Route 905 does not currently stop in Cambourne
- Buses primarily serve Cambridge, St Neots, and Huntingdon, but also serve some local villages.

Rail

- There are no railway stations in Cambourne.
- The nearest station is St Neots, ~14.5km to the west of Cambourne, with frequent services to London in ~50 minutes.
- Cambridge Railway Station is ~17km southeast of Cambourne, whilst Cambridge North Railway Station is ~19km to the east. Cambridge South Railway Station which is currently under construction is ~21km southeast.
- Huntingdon Station is ~17km northwest of Cambourne.

The current bus routes serve some key external destinations and satisfy some of the key demand corridors such as towards St Neots, Huntingdon, and Cambridge. However, current service frequencies a relatively low, with one bus every ~15-30 minutes and often have extended journey times due convoluted routes around Cambourne Town centre.

Journeys to other key destinations such as Bedford, Northstowe, Sawston, and Waterbeach require an interchange.



2.6 Highways

Road network and junctions

1. Caxton Gibbet roundabout was a 4-arm roundabout connecting the A1198 and A428. The A428 is existing dual carriageway and to the east and single carriageway to the west. The A428 Black Cat to Caxton Gibbet National Highway improvement scheme is providing a new grade separated junction and extend the dual carriageway to the Black Cat junction to the west.

2. Cambourne Road dumbbell junction will continue to provide access to the A428. It currently provides 2 northbound and 2 southbound lanes over the A428 with a pedestrian/ cycle route on the northbound side only.

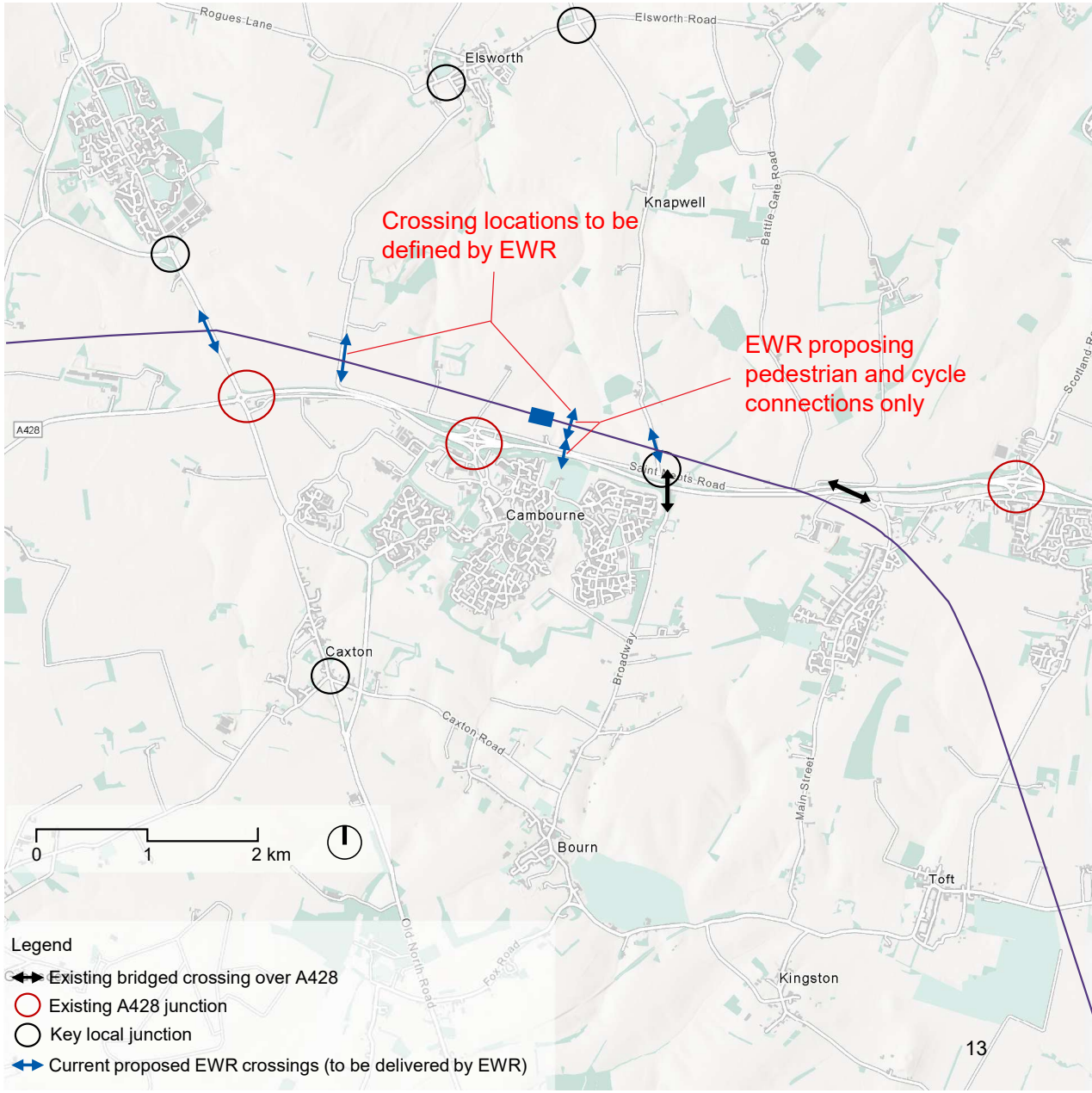
3. Scotland Road dumbbell junction will continue to provide access to the A428. It currently provides 1 northbound and 1 southbound lanes over the A428 with a footpath on the southbound side only.

4. An existing single carriageway bridge provides 1 northbound and 1 southbound lane over the A428 connecting Broadway with St Neots Road – with no direct access to the A428. Footways are provided on both sides of the bridge but only a narrow footway is provided beyond this on the eastern side of the highway.

2.7 Future Connections

Planned/Proposed

- Caxton Gibbet – new grade separated junction as part of the A428 Black Cat to Caxton Gibbet National Highway scheme. This is delivering a dumbbell junction arrangement with two roundabouts linking beneath a new A428 alignment.
- Additional crossings will be provided to mitigate EWR severance (to be provided by EWR) including on the A1198, St Neots Road (north south section) and Knapwell High Street.
- The location of the EWR crossing at St Neots Road (bridging over EWR) and at EWR station are yet to be fixed, therefore the spatial framework will need to respond to the final locations and an additional EWR crossing may be necessary.



3 Vision and Objectives

This chapter describes the vision for growth in Cambourne, and the objectives the new growth must meet to benefit both new and old communities alike, responding to local challenges and the regional ambition.

3.1 Vision

Cambourne 2060

In 2060, Cambourne is a **well-connected**, **sustainable**, **thriving** and **prosperous** town that is **rooted in nature**. Cambourne is famous across the region for the forest which wraps around the town – allowing nature to flourish and improving the wellbeing of local residents, employees and visitors. As one of the best connected places in Cambridgeshire, Cambourne is **a fantastic place to live, work or base a business**. Everyone who calls Cambourne home has easy access to a wealth of employment opportunities, services and facilities. Cambourne's excellent transport connections have also helped to make it **a destination in its own right**, with the Cambourne Forest, Events Hub, Leisure Hub and Cultural Hub all acting as major draws for visitors.

3.1 Vision

Key elements of the vision explained

Well Connected Cambourne
Cambourne is one of the best connected places in Cambridgeshire, with the Cambourne to Cambridge Busway and East West Rail making it a fantastic place to live, work or base a business. New walking and cycling routes and excellent local transport connections mean that every neighbourhood is less than fifteen minutes from local amenities, the Town Centre and Station Quarter, making it easy to get to work and access services.

Destination Cambourne
Cambourne has become a destination in its own right. People travel from across Cambridgeshire and the wider Oxford-Cambridge Region to visit an exhibition at the Cultural Hub, take in a show at the Cambourne Arena, go for a swim at the Leisure Hub or spend time in Cambourne's Forest.

Prosperous Cambourne
Start ups, spin outs and mid-tech businesses have flocked to the new Cambourne Station Quarter due to its favourable location (and cheaper rents than Cambridge!). New employment locations are less than 10 minutes from the Cambridge Biomedical Campus by train, as well as less than thirty minutes from several economic hubs to the West. A new economic cluster is growing around an anchor institution which has moved its headquarters here - attracted by the improved quality of life Cambourne offers its employees.

Thriving Cambourne
Cambourne's southern centre has been complemented by a new Town Centre north of the A428, with a new civic square playing host to an everchanging series of events including a regular market. New and improved connections across the A428 and EWR stitch the growing Cambourne together, with a landmark new 'landbridge' acting as an iconic connection between the main centres, Station Quarter, Leisure Hub and Arena.

A Place to Call Home
Each new neighbourhood of Cambourne has a unique character, with sensitively designed high quality sustainable homes that are entwined with nature. At the centre of each neighbourhood is a place to gather, with community uses, a corner shop, flexible employment spaces and a café or pub. Flexibility and resilience are built in from the start. People love living here because they can walk their kids to school, cycle to work and have culture, leisure and nature on their doorstep.

Green Cambourne
Cambourne is famous across the region for the forest which wraps around the town - creating homes for nature and improving the wellbeing of local residents, employees and visitors. The whole town has nature at its core, with neighbourhoods and centres connected by green spaces and places, strengthening local ecosystems and creating a healthy, resilient and sustainable intergenerational community.

3.2 Objectives

What needs to be achieved to deliver on the vision for Cambourne

Rooted in Nature

1. Cambourne's expansion will create and enhance a comprehensive network of green links, spaces and places easily accessible to the public.
2. A new large-scale woodland will grow alongside the town, creating significant amenity, health and wellbeing value for both locals and visitors and creating a separation between Cambourne and surrounding villages.
3. Cambourne's expansion will protect, enhance and create homes and connections for nature, including the protection of 'nature-only' habitats and routes used by the rare species that call Cambourne home.
4. Buildings, spaces and neighbourhoods will be designed and built to ensure low levels of climate and resource impact and embed high levels of climate resilience.
5. The expansion of Cambourne will help mitigate the impacts and maximise the benefits of major infrastructure investment by integrating these sensibly into the wider landscape, and by integrating nature-based solutions into the implementation of infrastructure proposals.

One Cambourne

1. Cambourne will be centred around a landmark 'living station' at the heart of the town, which is a movement hub that also supports inclusive growth and acts as a focal point for healthy community life.
2. The town centre will be full of activity throughout the day, due to the mix of inclusive civic, cultural, community, commercial, retail, transport and residential uses. Residents, and those in the surrounding villages and the wider area will be able to rely on Cambourne for their service needs.
3. Walking, cycling, wheeling and public transport will be the most convenient, safe and attractive choices for getting around, with high quality transport links between all neighbourhoods, centres, amenities and surrounding villages.
4. Cambourne will attract a range of new employment opportunities that are complementary to those in the wider Region. It will secure an employment anchor tenant to become the cornerstone of a new economic cluster.
5. Cambourne will be a destination in the Region, with people choosing to travel by sustainable modes to access the high-quality jobs, services and amenities.

Complete Communities

1. Cambourne will be home to regionally significant cultural amenities, leisure/recreation/events facilities and green space. Together these will support the quality of life of people living in, working in or visiting Cambourne.
2. Neighbourhood centres in Cambourne will provide a range of services for daily life and public spaces for intergenerational communities to gather.
3. Homes in Cambourne will be designed to foster health and sustainability, accommodating people at all stages of life while offering opportunities for self-build and co-housing.
4. Buildings, public spaces, neighbourhoods, centres and services will all be designed to be flexible, allowing them to evolve to meet the changing needs of people, place and planet.
5. Stewardship of Cambourne's new assets will be community-led and managed, expanding Cambourne's distinctive community spirit and collaborative culture.

3.3 Transport Vision

A vision for the transport strategy

The transport strategy will support the creation of a connected, sustainable and liveable place where most trips are made by walking, cycling or public transport, and everyday needs are accessible locally.

Principles:

- Plan development in a way that minimises the need to travel and reduces reliance on car trips, recognising that the number of external car trips generated will need to be restricted due to existing and forecast congestion on the local road network.
- Neighbourhoods should be 6,000 homes or greater and try as hard as possible to match with equal number of jobs within close proximity, which can support a scale of local facilities at their centre.
- The scale of retail, social and community uses should be in proportion to the number of homes/jobs and need to be planned and delivered from the outset to ensure that walkable/sustainable travel behaviours are embedded to absorb trips within settlement.
- Focus residential density around centres of activity and key transport access points such as mobility hubs and stations, with significant residential density delivered around the proposed EWR station.
- Ensure neighbourhoods are designed to be well-proportioned, contiguous developments with good connectivity that reflects the movement hierarchy, with active modes prioritised.
- Consider interventions to Cambourne South to maximise a ‘One Cambourne’ approach to sustainability and maximise the opportunities for Extended Cambourne.
- Phase delivery of services, public transport and public realm to support sustainable travel behaviours from the outset.

3.4 Transport network design principles

Active travel

- Provide a high-quality network of walking, cycling, and wheeling routes which form the most direct routes between existing and new local centres, bus stops and the EWR station.
- Minimise breaks in connectivity through crossings of the busway, EWR and highway connections, and priority given when these are unavoidable.
- Integrate landscape links for leisure and recreational routes.
- Local residential streets should be designed to be people-centric, well-lit and overlooked for 24-hour use. Activity and multi-modal integration encouraged to promote inclusive and equitable use. Woonerf-type principles where vehicles are guests and green and blue infrastructure integrated should be promoted.
- On the more strategic movement routes, which are planned to carry larger volumes of people and vehicles at greater speeds - and where there is greater chance of conflict between different modes of travel - dedicated, protected infrastructure would be provided for those walking and cycling (and between these – in line with best practice and guidance).
- Wider-scale, sustainable movement corridors should be promoted between new and existing communities (i.e. between Extended Cambourne, existing Cambourne and the villages).
- The active travel network, both internal and connecting to the existing Cambourne settlement and surrounding villages, should be programmed to be delivered prior to occupation of any new development to promote sustainable travel behaviours from the outset of the development.

3.4 Transport network design principles

Public Transport

- Establish a primary bus corridor through the development with high service frequencies serving local centres, which takes account of the potential in future to extend the planned Cambridge to Cambourne Busway. This route will have priority over vehicular movement with bus priority infrastructure provided at key junctions and seamless movement between neighbourhoods via modal filters.
- Integrate the busway into the urban fabric of the development, ensuring it is designed as part of the place, with high-quality facilities for waiting and accessing buses. The route will follow established design principles used on the existing network, with an ‘integration-first’ approach to support seamless interchange while considering safety, permeability, and the wider movement framework.
- Develop Cambourne EWR station as a multi-modal hub with direct and legible walking, wheeling, cycling, and bus access, prioritising sustainable modes in the station public realm. This hub will have some provision for EV car sharing and taxi drop-off and pick up, as well as Blue Badge parking. Car parking away from the station forecourt ensures a people-first public realm experience, with active travel linkages and fast and efficient interchange between bus stops and the station.
- To supplement the busway and new rail service from EWR, the local bus network will need to be redesigned to better meet the needs of both existing and new residents. While some changes to bus routings (such as through Cambourne West and Bourn Airfield) have previously been proposed by developers, a comprehensive and coordinated replanning of the wider local bus network is now required to support full development. This should consider the role of both fixed-route and on-demand services to ensure that all neighbourhoods benefit from frequent and reliable public transport that connects and integrates with both the EWR and Busway proposals.

3.4 Transport network design principles

Highways

- As an overall principle, the vehicular movement network has been designed as more circuitous and less direct than the sustainable movement network, to promote movement by walking, wheeling, cycling and public transport.
- Main vehicular access to Extended Cambourne to be provided via existing/planned infrastructure including the enhanced dumbbell roundabout from A428, which is also likely to accommodate majority of demand for vehicles accessing station. There will be no direct access onto the improved Caxton Gibbet junction but additional routes from the north, east and west will be available to balance overall demand on the highway network.
- Vehicle routes will be designed to minimise crossings of sustainable networks, and where there are intersections, central islands or wide refuges will be designed into the street to enable convenient pedestrian crossing points.
- To remain within the restrictive vehicular trip budget, the design will discourage ‘rat-running’ and reduce the attractiveness of car trips into Cambridge through convoluted routing, targeted modal filters (to enable high-quality public transport) and traffic management, supplemented by off-site measures at Knapwell, Boxworth and Papworth Everard.
- Within the settlement itself, streets will be designed to provide a network of connected low speed access routes that balance local vehicle movements between routes and avoid concentration of traffic flows where possible.
- The use of modal filters should be explored where this will support high-quality public transport access through the development, whilst restricting more direct vehicular trips.

3.4 Transport network design principles

Land Use

- The scale and offer of different local land uses at Extended Cambourne should be planned to absorb a high proportion of everyday trips within the settlement, reducing the need for longer car-based trips.
- The following land uses should be provided within walkable neighbourhood centres and key hubs:
  - Primary and secondary schools
  - Early years provision
  - Health services (GP, pharmacy)
  - Local employment space
  - Retail and convenience shopping
  - Community and leisure facilities
- Cambourne station should be designed as an integrated local centre with a mix of uses and high-quality public realm, not a standalone transport node.
- Delivery of these land uses should be phased early to support sustainable travel behaviours from the outset of development.

Phasing

- Networks should be designed to maximise the end-state opportunity, while allowing flexibility to support delivery and viability during early phases as travel behaviours evolve.
- Active travel routes and any required crossing infrastructure to connect with existing Cambourne should be delivered prior to first occupation.
- The Busway extension and primary bus corridor should be delivered early, considering the uncertainty around the timescale for EWR delivery and operation.
- Early phases should incorporate interim public transport solutions to establish sustainable travel behaviours from the outset.

3.4 Transport network design principles

Densities

- Residential density should be focused around centres of activity and key transport access points, particularly the proposed EWR station and primary public transport corridors.
- Higher residential densities of 50–70 dph should be promoted in these locations to support public transport viability and walkable access to key services.
- Lower densities can be provided in more peripheral areas, but street layouts should maintain permeability and strong walking/cycling connections. These lower density areas should still provide community, leisure, education and retail facilities to ensure that car reliance and dependency is not designed into the spatial framework.
- Block structure, street permeability and proximity to services should take priority over car parking ratios in guiding density and layout decisions.

3.4 Transport network design principles

Neighbourhoods

- Neighbourhoods should be structured to enable 10-minute walk access to local services and centres.
- Neighbourhoods should be well-proportioned, contiguous development with good connectivity and permeability for walking and cycling.
- Street networks should avoid cul-de-sacs and be designed to allow free-flowing access for walking, wheeling, and cycling, while using filtered permeability to limit through-access for motor vehicles.
- Local centres should be located on public transport corridors and provide high-quality, walkable public realm.
- Green and blue infrastructure should be integrated with walking and cycling networks, supporting leisure and recreational movement.
- The ‘One Cambourne’ approach should ensure that new neighbourhoods in Extended Cambourne are well connected to Existing Cambourne via high-quality sustainable movement corridors.

Scale

- Neighbourhoods should be designed at a scale that supports a critical mass of population and local services.
- A neighbourhood scale of 6,000 homes or greater with a comparable number of jobs provides the basis for walkable local centres and viable public transport.
- Existing Cambourne and Extended Cambourne are expected to accommodate a total population of 50,000 people. This scale of growth can help to fully support self—sufficient facilities, promote sustainable movement and deliver an integrated town structure.
- Development phasing should ensure that new growth areas are contiguous with existing Cambourne and contribute to a cohesive, walkable settlement.

The existing A428 imposes severance between existing and Expanded Cambourne, with limited, vehicle-dominated crossing opportunities. The future EWR alignment will introduce a further barriers. The movement strategy therefore promotes high-quality walking/wheeling/cycling links integrated with green corridors, maintains bus permeability across both corridors, and coordinates delivery with National Highways and EWR — measures that are essential to achieving the mode share objectives and staying within the vehicular trip budget.

4 Travel Demand

This chapter sets out the travel demand and analysis that has been undertaken to technically assess the likely number, mode and distribution of travel to and from the opportunity at Extended Cambourne

4.1 Travel Demand Introduction

Overview

To support the design advice that has been given in development of the Spatial Framework Strategy development, we have produced an analysis of travel demand that allows us to compare baseline movement patterns with a vision-led future scenario. This section is set out as follows:

- Section 4.2 sets out the methodology that was developed to determine the travel demand for Extended Cambourne, including the assumptions made and an overview to our in-house modelling programme, MoDES.
- Section 4.3 presents the output from the MoDES model, specifically the mode share and travel demand in two scenarios developed for Extended Cambourne. The scenarios developed are set out below:
    I. Baseline scenario: A Business-as-Usual (BAU) approach that takes mode shares that reflect existing Cambourne and then applied to Extended Cambourne.
    II. Vision-led scenario: An aspirational scenario that presents mode shares that take into consideration enhanced public transport connectivity, walkable neighbourhoods and town-centre scale of facilities and development of extensive active travel infrastructure.
- Section 4.4 presents another output from the MoDES, specifically the level of trip internalisation by Extended Cambourne to better understand the level of external travel demand expected that directly impacts the Trip Budget set out by Cambridge Sub Regional Model (CSRM) DS2 (Do Something 2) .
- Section 4.5 compares the expected external travel demand with the CSRM Trip Budget.
- Section 4.6 concludes the section by summarising the output of MoDES and how it compares to the Trip Budget. Suggestions are also presented to enhance viability of development.

4.2 Methodology

Assumptions

The Spatial Framework has been designed to maximise the opportunity to internalise trips generated by the proposed development. The main principles include:

- Optimising number of jobs created in relation to number of dwellings
- High density of dwellings that support town centre scale of facilities
- Amenities and facilities within walking and cycling distances
- A public transport network that maximises connectivity between local population and centres

The Cambridge Sub Regional Model (CSRM) DS2 (Do Something 2) run have assumed the following for Extended Cambourne:

- 20,000 dwellings and 20,000 jobs will be delivered
- There will be four neighbourhoods within the site, two of which have town centre scale of facilities
- Planned infrastructure works include delivery of EWR station, the extension of the CtoC busway throughout the site, extensive active travel provision both within the site and connecting to existing Cambourne, and significant highway improvements to surrounding roads to facilitate access to the North, East, South, and West.
- Connections to surrounding communities by walking, wheeling, cycling, and public transport are also assumed to support regional access and promote sustainable travel.

4.2 Methodology

MoDES Overview

MoDES or Modal Demand & Externalisation of Settlements is an in-house Arup tool which forecasts multimodal travel demand at settlements and the degree to which the demand in ‘internal’ and ‘external’ by mode.

Total travel demand is forecast from the development mix (the number of dwellings, the mix of those dwellings, the number of jobs, and the scale of logistics land uses) drawing on data from the TRICS database.

Total internalisation and externalisation is forecast based on the scale of the ‘centre’ and associated retail and community uses (such as schools) and the relationship between the number of jobs and the number of workers within the settlement, informed by observed relationships from Census data.

Total travel demand is disaggregated into multiple separate journey purposes with reference to the National Trip End Model (NTEM) and the National Travel Survey (NTS).

A baseline travel demand mode share for each journey purpose is informed by data from NTEM for reasonably comparable local towns and villages, by NTS and by Census as well as by the forecast level of internalisation. Census data sets a locally specific baseline forecast for work journeys, and the relationship between the NTEM and NTS derived work mode share and the locally specific Census work mode share informs adjustments to the mode shares for other journey purposes to create a site-specific baseline mode share.

A vision-based travel demand mode share for each journey purpose is determined hierarchically, beginning with propensity to walk and ending with propensity to travel by car. Propensity to walk is derived from the shape and size of the development and the distance between each part of the development and the ‘centre’ drawing on relationships derived from the NTS. The propensity to cycle is drawn from NTEM and NTS and by the assessor's judgement of the quality of the cycle infrastructure for internal and external journeys. The propensity to travel by bus and rail is derived following a similar process to forecasting propensity to cycle. Propensity to travel by car as a driver or a passenger are those journeys not made by other active or sustainable modes.

The forecast internalised demand from resident workers is aligned to the forecast internalised demand to jobs within the settlement to ensure balanced ‘trip ends’.

Internalisation and externalisation by purpose and mode is forecast based on the anticipated mix of uses within the settlement, the level of infrastructure for each mode provided within and beyond the development and always controlling to total internalisation and externalisation forecast at the start of the forecast process.

It should be noted that whilst the CSRM model run has assumed 20,000 homes/ 20,000 jobs, through capacity and market testing, it has been determined that the Spatial Framework Strategy extents would only be able to deliver c.13,000 homes and 6,000 jobs. An assessment this proposed number of homes in jobs being delivered in Extended Cambourne is set out in the following sections.

4.3 Travel Demand

Mode share for Extended Cambourne

The Baseline scenario reflects the current mode share for all trip types in Cambourne, applied to the future development of Extended Cambourne. In contrast, the Vision-led scenario presents an aspirational outlook, where the built environment is designed to be walkable, cyclable, and well-connected through multiple sustainable transport modes.

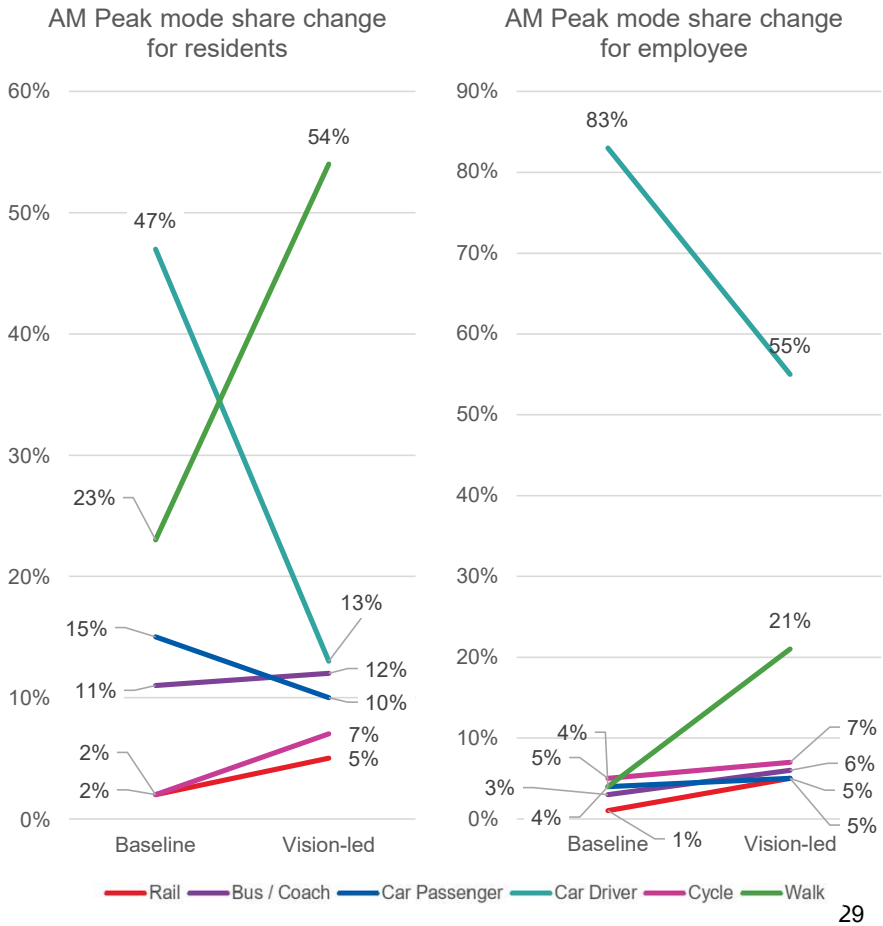
Distinct mode shares have been developed for residents and employees of Extended Cambourne, acknowledging the differing travel behaviours between these groups.

For residents, the most significant shift in mode share is anticipated in walking, driven by the integration of the Walkable Neighbourhoods concept into the design of Extended Cambourne. This approach supports the ambition to convert the majority of trips, including commuting, education, leisure, and other purposes, into walking trips. As a result, the share of car driver and passenger trips is expected to decline. Additionally, the provision of an enhanced cycling and public transport network, including the new East West Rail (EWR) station and the Cambridge to Cambourne (CtoC) busway, is projected to increase the use of rail, bus/coach, and cycling among residents in the Vision-led scenario.

While most employees are expected to be local to Extended Cambourne, the creation of new employment opportunities will also attract workers from surrounding towns and villages. Consequently, although car trips are projected to decrease, they may still represent the majority of employee travel due to the broader catchment area.

The mode shares have been applied to the projected number of residents and employees in Extended Cambourne, resulting in a net vehicle difference of approximately 3,500 between the two scenarios during peak hours.

The charts on the right illustrate an extract of the changes in mode share for residents and employees between the two scenarios during the AM Peak. Further work would be required to validate the realism of the vision-led numbers. Full mode share breakdowns and trip numbers are available in the Appendix.



4.4 Trip Internalisation

Internal vs external trips for Extended Cambourne

A key output of MoDES is the projected level of trip internalisation that can be expected within a neighbourhood. This internalisation is influenced by the walkability of the area, as well as the quality of public transport and cycling connectivity available.

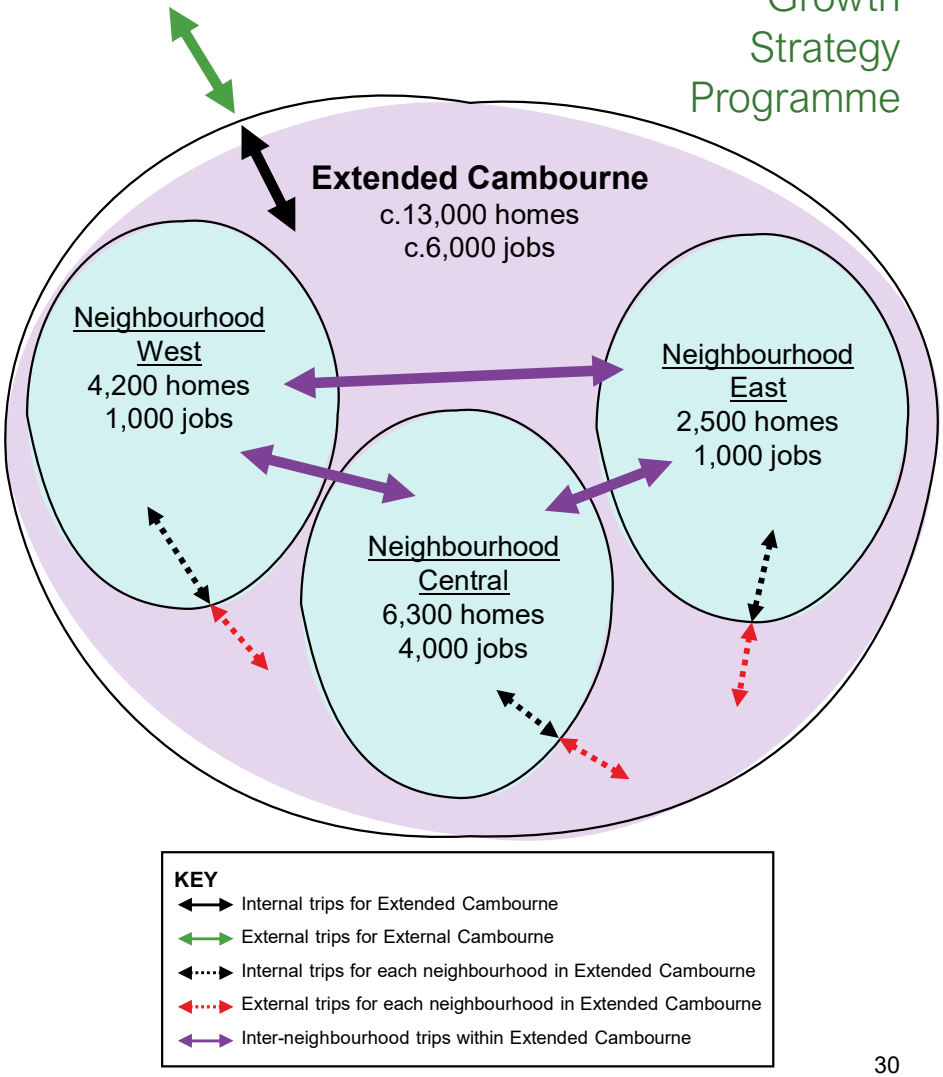
For the overall Extended Cambourne development, it is estimated that approximately 56% of all journeys and 28% of car trips will be internalised. This means that the majority of trips during peak hours will both originate and terminate within Extended Cambourne.

Each neighbourhood within the development has a unique mix of dwellings and employment opportunities, resulting in varying levels of trip internalisation. The highest internalisation is observed in the largest neighbourhood, currently referred to as Neighbourhood Central, with around 45% of trips internalised during peak hours. This is expected, given its high concentration of homes and jobs, which supports more locally-contained travel.

Trips that are external to a neighbourhood include those that leave Extended Cambourne entirely and those that occur between different neighbourhoods within Extended Cambourne (i.e. inter-neighbourhood trips).

Overall, approximately 44% of all journeys and 72% of car trips generated by Extended Cambourne are expected to be external. This translates to roughly 2,600–3,000 external car trips during peak hours, which will feed into the wider road network, including the A428, A1198, St Neots Road, and beyond.

The figure on the right illustrates the breakdown of internal and external trips as modelled in MoDES. Further work would be required to validate the realism of the vision-led numbers. Full details on trip numbers by neighbourhood are available in the Appendix.



4.5 Trip Budget

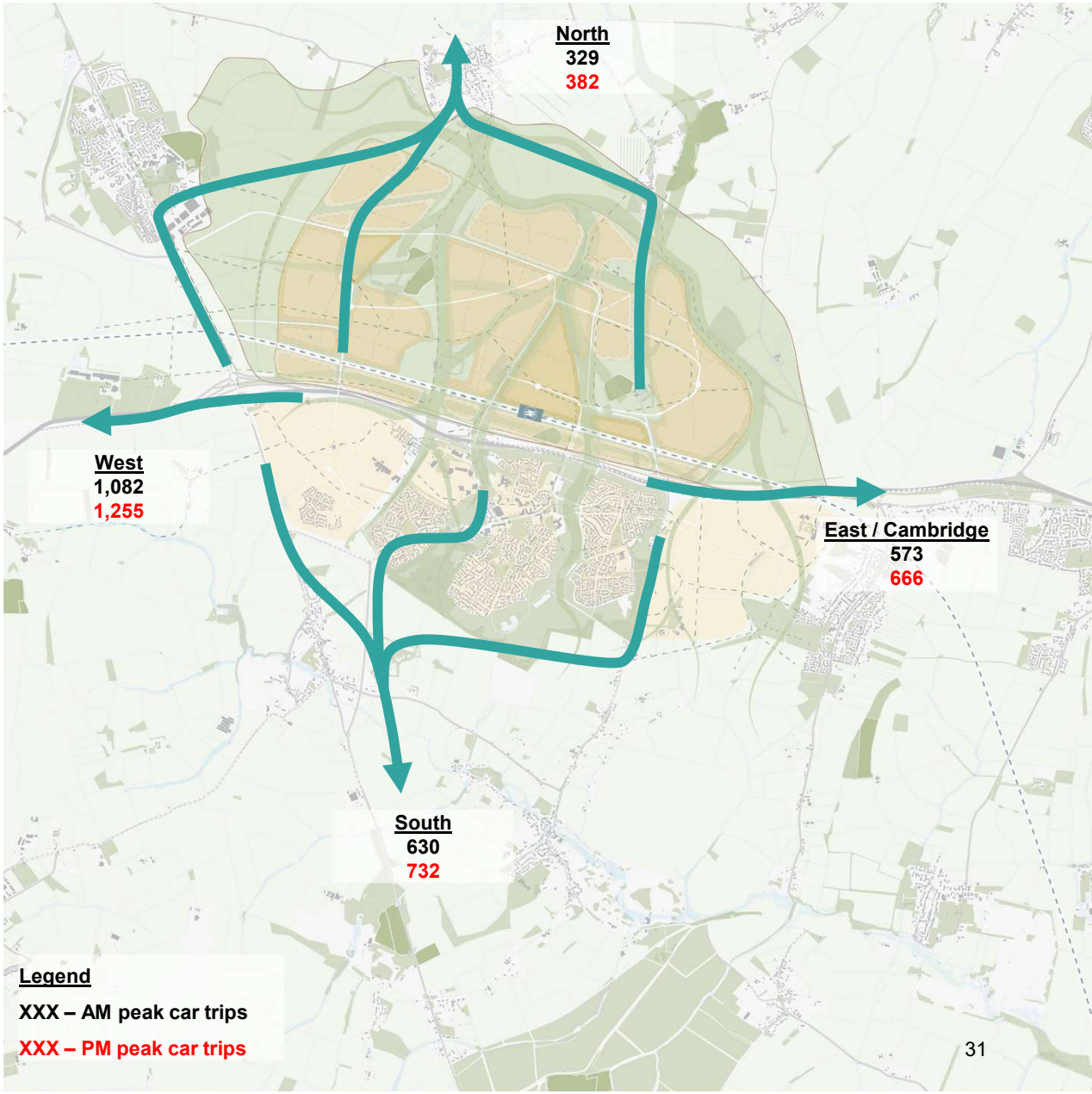
Two-way external trips from/to Extended Cambourne

Future development and growth in and around Cambridge is currently constrained by significant transport capacity limitations. Along with this congestion, there are stakeholder concerns around rat running and vehicular trip attraction with the arrival of a new station at Cambourne.

The Trip Budget provided by the CSRM model is based on the road network's capacity to accommodate increased vehicular demand. As such, particular attention is given to the number and distribution of external trips and car trips to better understand where these trips are likely to occur.

Following the optimisation of trip internalisation for Extended Cambourne, the development is still expected to generate approximately 2,600–3,000 external car trips during peak hours. It is assumed that the DS2 directional distribution for external trips can be applied consistently across all modes, resulting in the car trip distribution illustrated in the figure on the right. Full trip distribution data is available in the Appendix.

A key factor influencing the Trip Budget is the congestion on the road network feeding into Cambridge. Outputs from the MoDES model indicate that the number of car trips travelling to and from Cambridge and the east is approximately 570–670 vehicles during peak hours. This is compared against the Trip Budget allocations for these directions, which are 492 for Cambridge and 42 for the east—totalling 534. It can be observed that the MoDES output slightly exceeds the Trip Budget by approximately 40–140 vehicle trips.



4.6 Travel Demand Conclusion

Conclusion

The MoDES output presents the projected travel demand for Extended Cambourne under a Vision-led scenario with an aspirational mode share. In this scenario, a significant increase in walking trips is observed, accompanied by a reduction in car trips generated by the development. However, despite this shift towards more sustainable travel patterns, the scale of development (c.13,000 homes and c.6,000 jobs) is still expected to generate external car trip volumes that slightly exceed the Trip Budget set by the CSRM model.

To address this, the development may consider a combination of blanket and targeted interventions aimed at reducing external vehicle trips. A list of example interventions is presented on the right; however, many of these are site-specific and may be explored in greater detail at later stages.

Additionally, if more information becomes available regarding critical junction movements, specifically those operating at or near capacity, it would be possible to target interventions more precisely. This would allow for increased trips in non-critical directions without materially impacting the performance of key infrastructure. Achieving this requires more detailed data on vehicle travel demand proportions.

It is important to note that while the Vision-led scenario presents a strong aspiration for sustainable travel, further study is required to assess the realistic achievability of these mode share targets within the local context. Factors such as existing infrastructure, travel behaviour, and regional connectivity will play a crucial role in determining the success of these interventions.

Blanket Interventions (applied broadly across the development):

- Restrict on-site parking, particularly at employment centres near public transport nodes. However, there is risk that this may impact commercial viability.
- Promote workplace travel planning to encourage businesses to support cycling and public transport, noting that significant mode shift is already assumed.
- Increase bus services to the north and south to capture more trips via public transport. However, there is risk that this may be financially unviable and does not influence trips through critical junctions.
- Foster partnerships between businesses and public transport operators to offer discounted fares.
- Support flexible working arrangements, such as hybrid or staggered hours, to reduce peak-hour demand.
- Enhance active travel infrastructure, including improved wayfinding and information to encourage walking and cycling.
- Introduce carpooling schemes within employment centres to reduce single-occupancy vehicle use.
- Targeted improvements to existing Cambourne to enhance sustainability and offset vehicle trip increases from North Cambourne.

5 Regional Connectivity

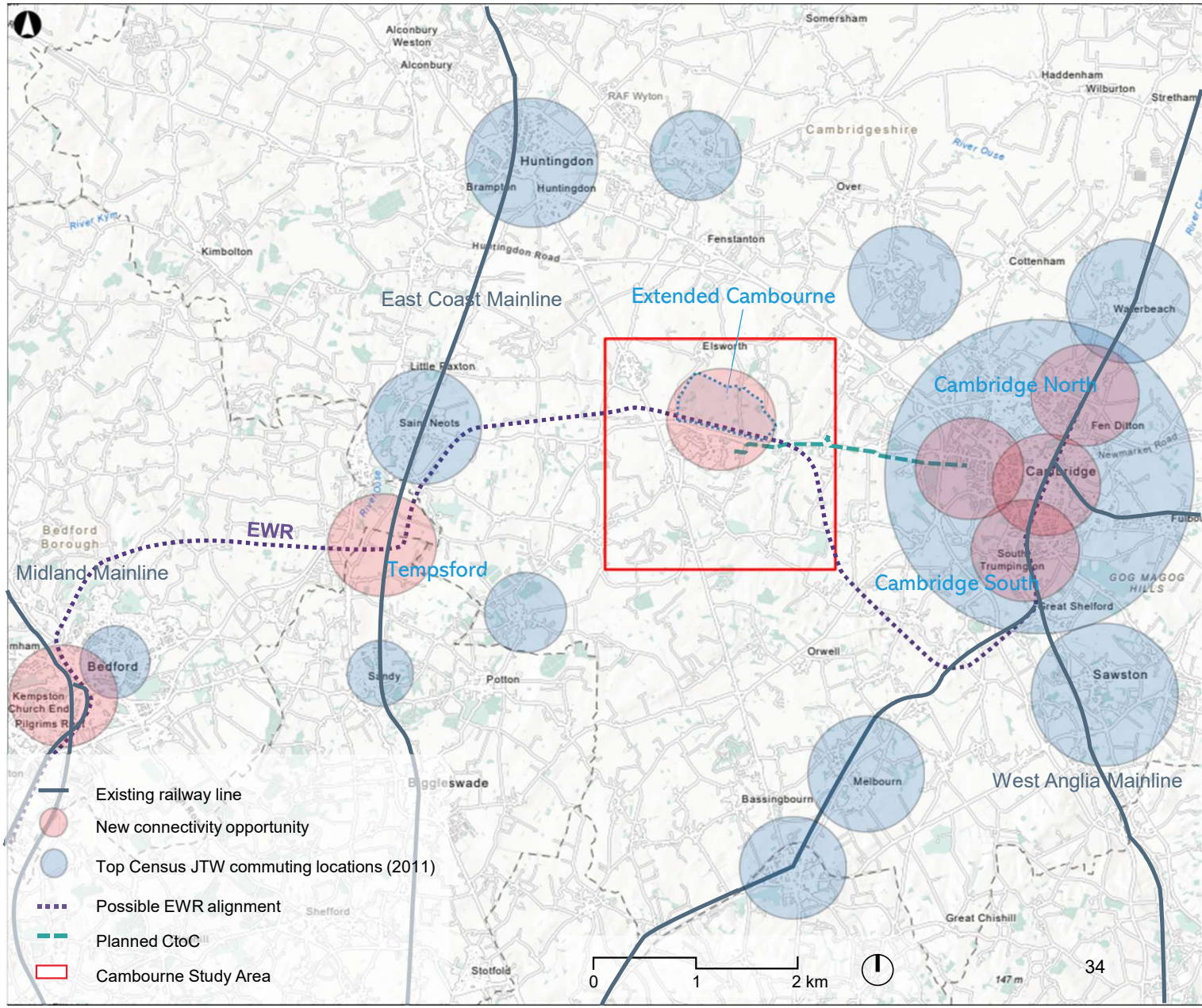
This chapter sets out the changes in future regional connectivity

5.1 CtoC and EWR

New opportunities

CtoC and EWR will enhance regional connectivity and open new opportunities for commuting to (and from) the following locations with potential for onward interchange at Bedford (Midland Mainline), Tempsford (East Coast Mainline), Cambridge (West Anglia Mainline):

- Cambridge North
- Cambridge
- Cambridge South
- Extended Cambourne
- Tempsford
- Bedford



6 Local Connectivity

This chapter sets out the changes in future local connectivity

6.1 Crossings

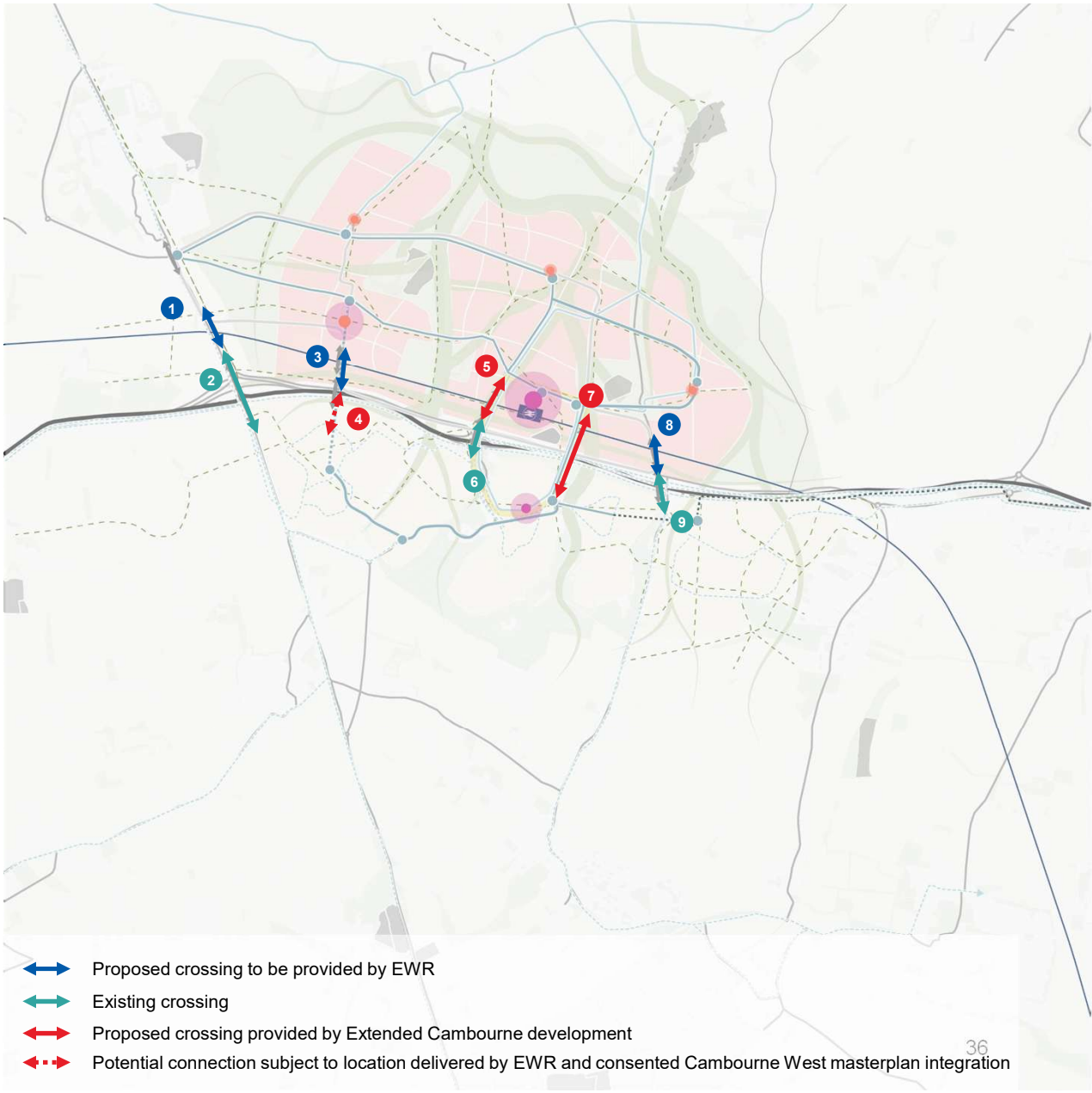
Integrating with existing Cambourne

The image illustrates the existing, potential and proposed crossings which will ensure the connection of Extended Cambourne with Existing Cambourne.

1. New all mode crossing of A1198 and EWR
2. A428 Caxton Gibbet junction all mode crossing currently being upgraded by National Highways
3. New all mode crossing of St Neots Road over EWR
4. Potential pedestrian/ cycle and bus connection over A428 subject to integration with consented masterplan
5. New all mode crossing of EWR
6. Existing A428 dumbbell junction all mode crossing
7. Pedestrian, cycle, and busway connection to be delivered over EWR, St Neots Road and A428, with no access for general traffic. To be delivered by EWR/ Extended Cambourne
8. New all mode crossing over EWR
9. Existing all mode crossing at Broadway

Crossing provided by:

- n EWR
- n Local Authority/ National Highways
- n Extended Cambourne



6.2 Caxton Gibbet Crossing

National Highway Proposed Design

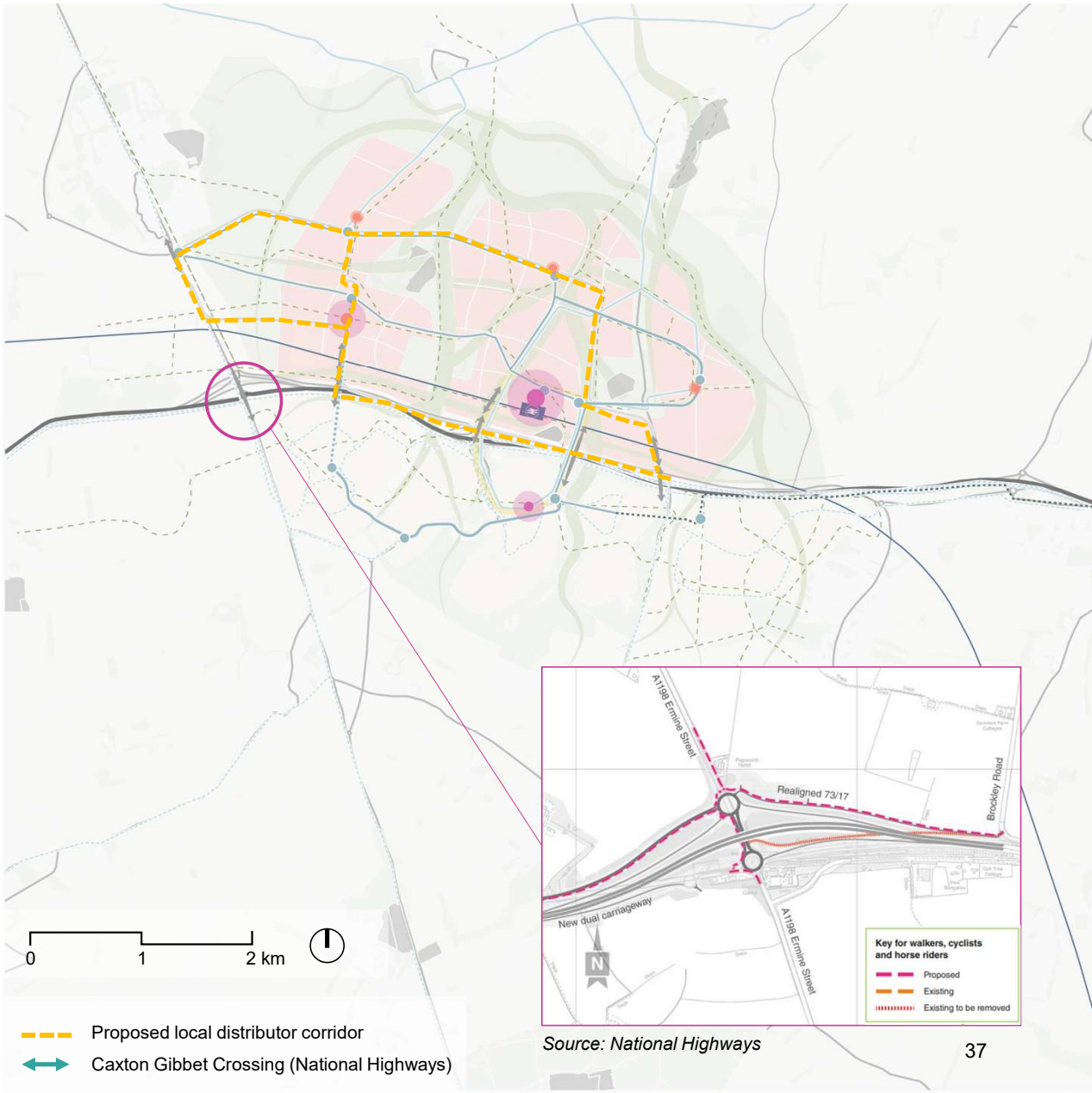
The A428 Black Cat to Caxton Gibbet Road Improvement scheme involves the dualling of the A428 between A1/A421 Black Cat Junction and A428/A1198 Caxton Gibbet Junction to high quality dual carriageway. Construction will include 19km of new Dual Carriageway, and Grade separated junctions.

The scheme includes:

- New junctions at Caxton Gibbet and St Neots Road, connecting the new dual carriageway to the existing A428 and increasing the local road network's ability to cope with unforeseen incidents;
- Improved pedestrian and cycle crossings via the A1198 (Ermine Street)
- New bridges over the River Great Ouse and East Coast Main Line railway

The new junction is expected to be completed in 2027; parts of the new alignment are now open to traffic including parts of the new Caxton Gibbet junction.

The improvements will provide safe N-S and E-W crossings, allowing a route South from Papworth Everard to Cambourne West development which is currently under construction.



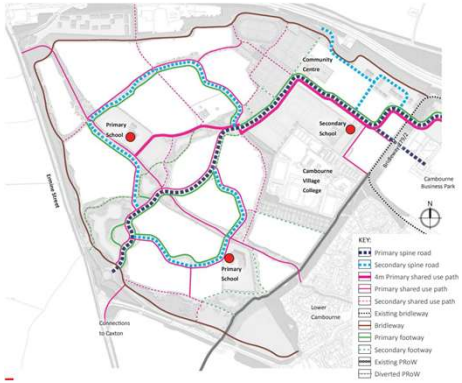
Source: National Highways

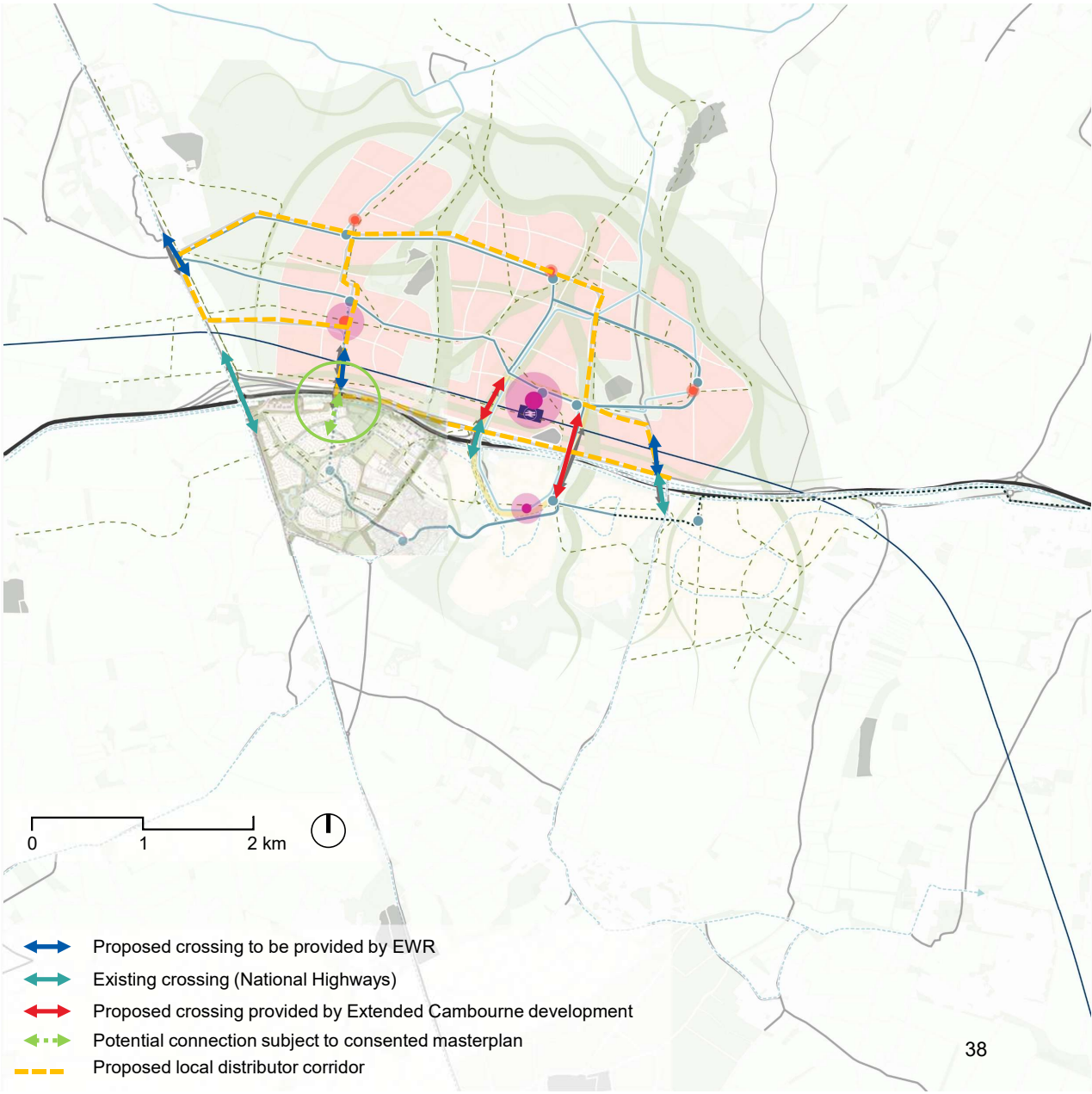
6.3 Cambourne West Masterplan Connection

Potential Crossing

The consented Cambourne West Masterplan includes vehicular connections to the southwest to A1198/ Ermine Street, and in the northeast connecting with existing Cambourne Business Park. All other access points are pedestrian/ cycle only with a bridleway proposed around the perimeter of the site.

To integrate Extended Cambourne with Cambourne West without relying on the strategic road network junctions, a pedestrian/ cycle and potential bus connection could be provided on the northern edge of Cambourne West, subject to integration with the consented masterplan.



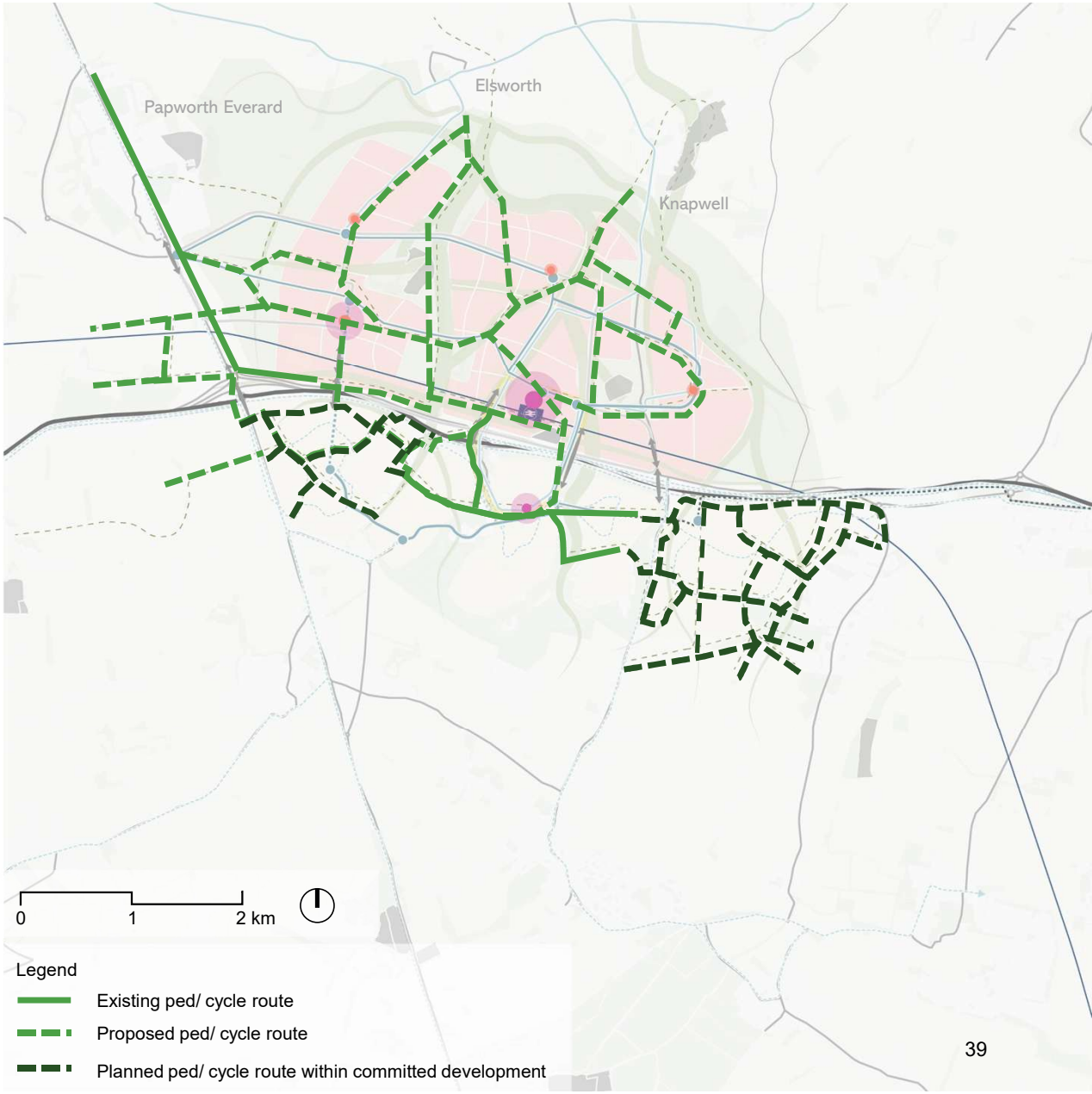


6.4 Active travel

Connecting Extended Cambourne

The image illustrates the existing, planned and proposed active travel routes which would ensure sustainable connections across and between existing and Extended Cambourne.

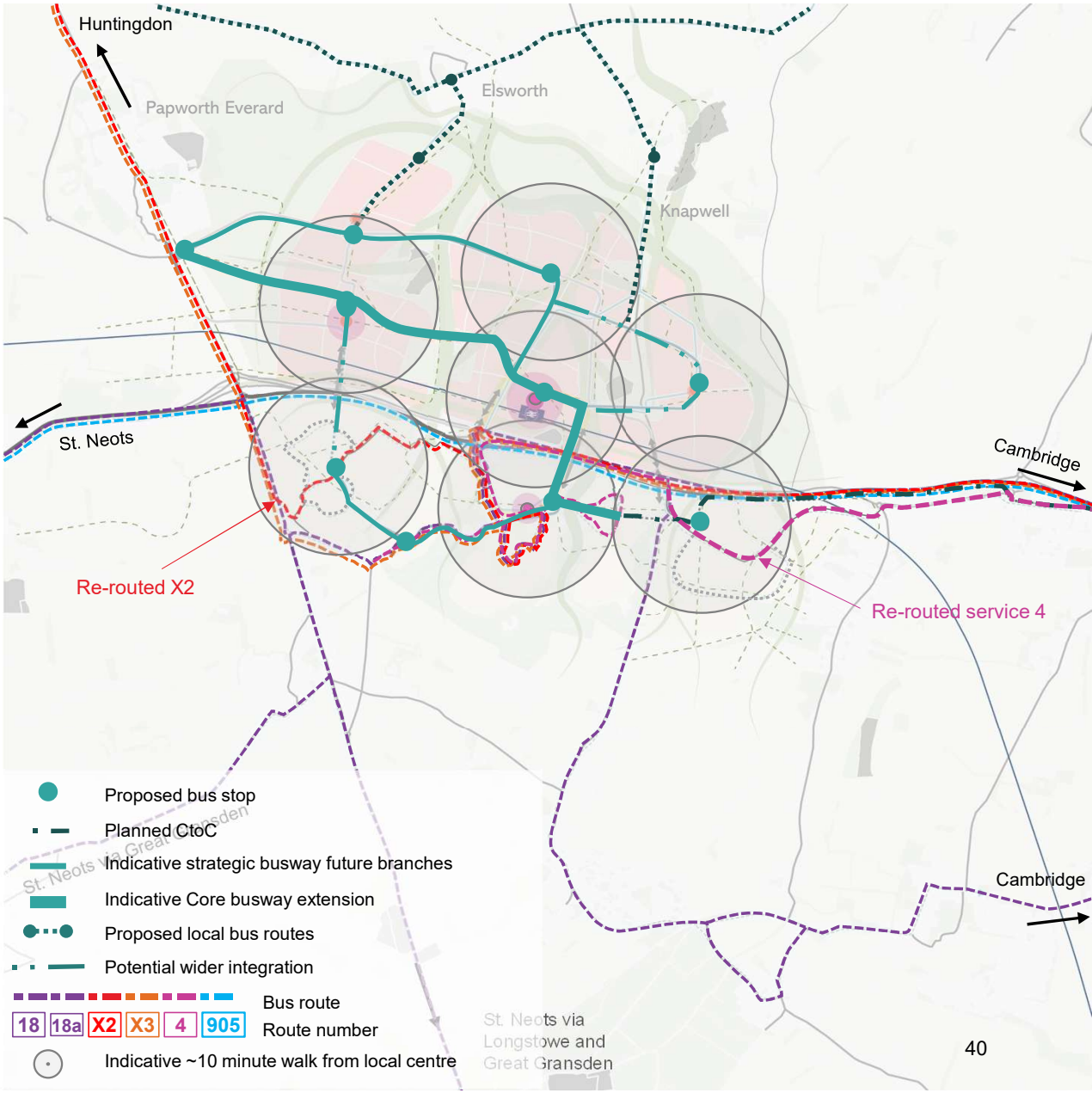
- A connected network of proposed, planned, and existing pedestrian/cycle routes forms a fine-grained grid across Extended Cambourne, existing Cambourne, and nearby villages (Elsworth, Papworth Everard, Knapwell), providing direct access to local centres, bus stops, and the EWR station.
- Strategic linkages maintain route continuity across the busway, EWR, and highways, with priority for active travel and convergence at key nodes to support safe crossings and seamless modal interchange.
- The network is integrated with a strong green-blue infrastructure, using green corridors and open spaces to support leisure routes, connect residents to nature, and promote wellbeing through active recreation.
- Wider-scale movement corridors link Extended Cambourne with existing Cambourne and surrounding villages, enabling sustainable regional connectivity and reducing car dependency.
- This layered approach delivers an inclusive, accessible, and sustainable transport network, supporting healthy, connected, and climate-resilient communities.



6.5 Public transport

Connecting Extended Cambourne

- A primary bus corridor, forming an extension to the CtoC busway is proposed to be provided through Extended Cambourne. The routing has been designed to maximise coverage whilst maintaining direct connections between local centres. It will be well-integrated into the urban form, ensuring permeability and minimising severance whilst also balancing the need to ensure fast and reliable journey times.
- The EWR station is proposed as a key mobility hub location. The station area will prioritise access by walking, cycling, and bus, with car parking located away from the station forecourt to reinforce the modal hierarchy.
- A series of new local bus routes will supplement the main corridor, enhancing connectivity to surrounding villages including Papworth Everard, Knapwell, and Elsworth, and supporting access to key destinations such as schools and local centres.
- Existing bus services, such as route X2 and 4, are proposed to be re-routed and extended to serve new developments (Bourn Airfield and West Cambourne) and also improve regional links, including towards Huntingdon. The full network illustrated adjacent shows that the current bus routes serve Huntingdon, St Neots, and Cambridge, (with route 18/18a also travelling through local villages to the south). Other journeys such as those to the NE (Northstowe, Waterbeach, Milton) and SE (Duxford, Royston, Sawston), which make up a large % of commuter trips require an interchange in Cambridge (and take 1hr+ vs ~20 min drive).
- Therefore, there will need to be a comprehensive redesign of the bus network to ensure proximity of residents to frequent, reliable, and comfortable services that are integrated with EWR and CtoC to deliver a seamless, sustainable movement network across Cambourne and beyond. There will be a need to investigate new routes, extensions and diversions when masterplans are brought forward.



6.6 Mobility Hubs

Hierarchy

The Busway will be supported by a network of mobility hubs across Cambourne and the surrounding area. These will vary in scale and function, but all provide seamless interchange between walking, cycling and public transport. We anticipate a three-tier mobility hub hierarchy:

Local mobility hubs at Knapwell, Elsworth West Cambourne and Bourn Airfield, offering basic facilities and links to the wider network, including:

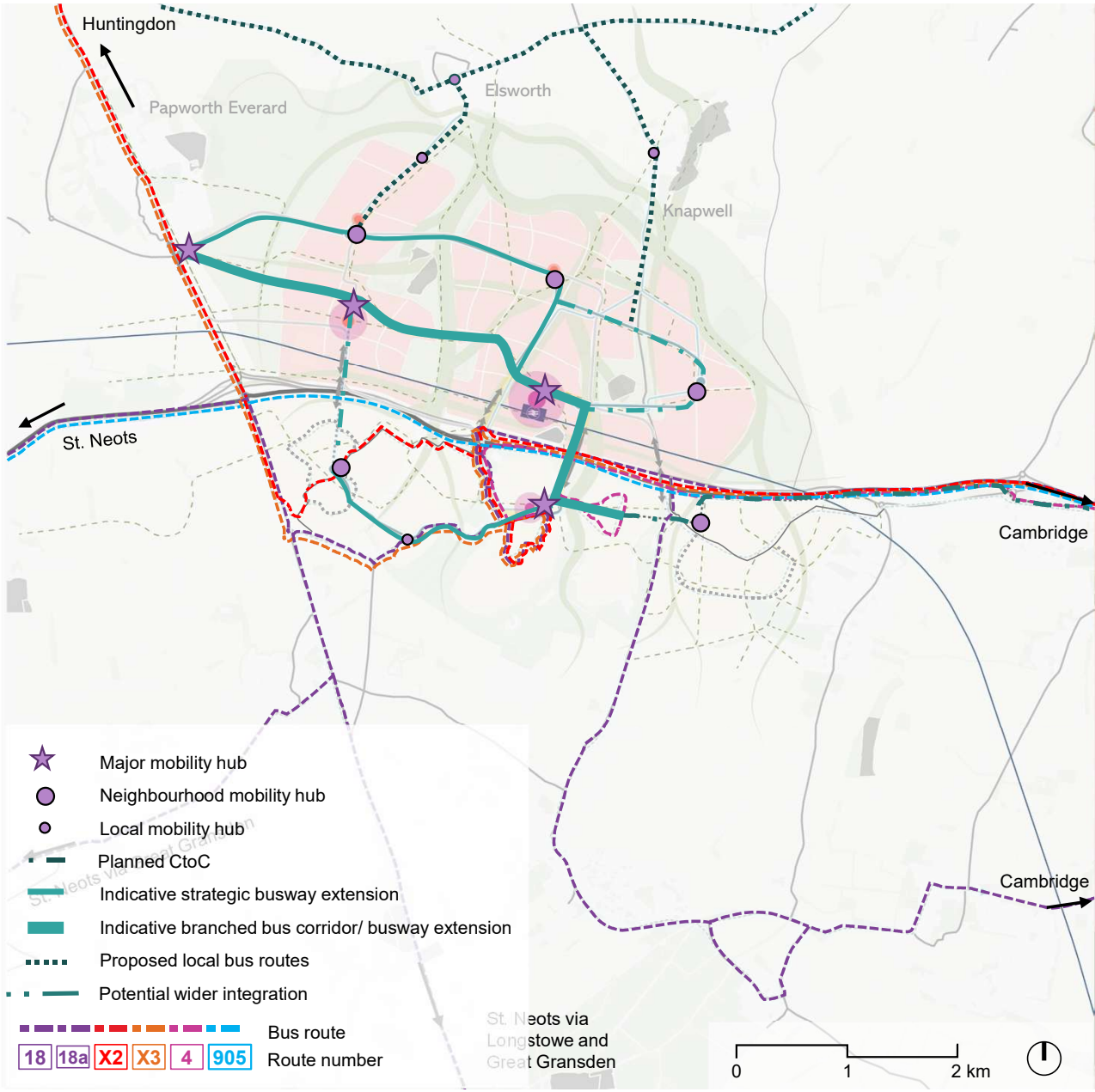
- Shelters, digital wayfinding, drop-off/pick-up bays, secure cycle parking and self-repair station, dockless e-cycle and e-scooter rental, delivery lockers, electric vehicle car sharing, restroom/baby-changing, elements of play/seating

Neighbourhood mobility hubs at local centres at Cambourne West (SCDC offices) and the northern and eastern edge of Extended Cambourne, supporting local access and connecting into active travel routes, which could include all from a local hub but also:

- Small kiosk, co-working space, pocket parks and community garden, more expansive secure cycle parking and charging.

Major mobility hubs at the Cambourne EWR station, existing Cambourne and south of Papworth Everard, serving as key interchange points and potential park & ride locations, which could include all the local and neighbourhood elements but also:

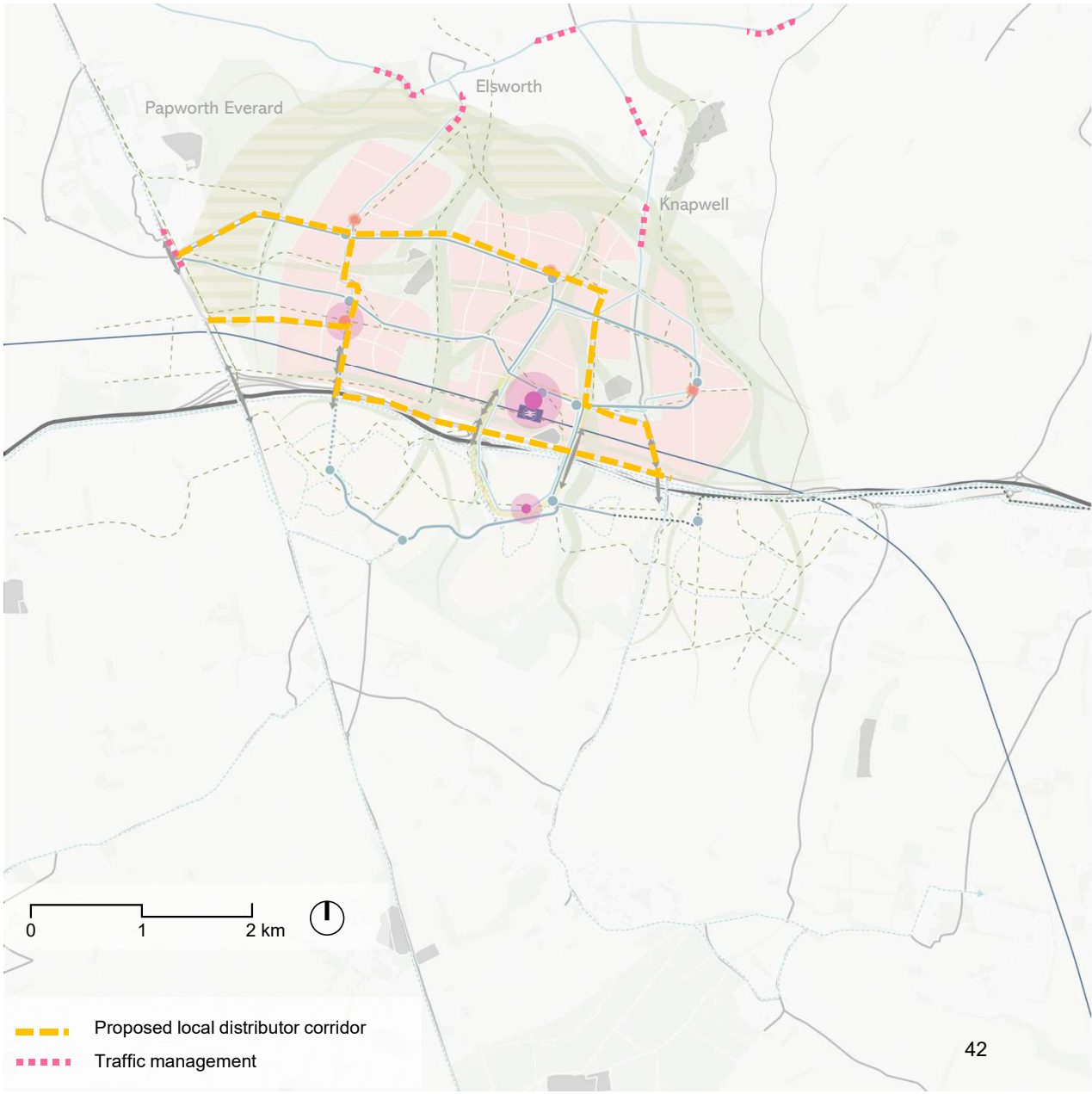
- Climate controlled (heat/cool) shelters, café, pop-up food outlets, cycle mechanic, cargo-bike hire, interactive digital wayfinding.



6.7 Highways

Connecting Extended Cambourne

- Two main corridors are provided (dashed yellow) in outer development areas the north and south to prioritise inner areas for use by active travel and buses, and to minimise crossings of sustainable networks and landscape linkages.
- The proposed main roads are also less direct than more sustainable options, thereby helping to encourage more sustainable choices, and will have low speeds to minimise conflict with other modes.
- Main vehicular routes have been proposed that align and utilise existing/planned infrastructure, including the existing A428 dumbbell roundabout and the existing Broadway crossing over A428. The existing dumbbell roundabout from A428 will provide access to the EWR station, employment areas and will allow servicing of local centres. Onward travel northbound would therefore be limited for general traffic but could provide flexibility for early development phases and serve as an important corridors for buses and active modes.
- Typical traffic management measures which could include such interventions as speed limits, priority chicanes, ANPR-based enforcement zones, or restricted turn bans at peak hours will be introduced to further help to reduce ‘rat-running’ through surrounding villages.



7 Phasing & Resilience

This chapter sets out indicative delivery timelines and phasing and resilience considerations

7.1 Achieving the vision

Indicative timeline of interventions

2025 | **2030** | **2035** | **2040**

Big Infrastructure Moves

Target EWR DCO submission

Completion of National Highways A428 scheme with new Caxton Gibbet junction

Completion of CtoC

EWR Construction begins

Completion of EWR (mid 2030s)

Extended Cambourne

Early development phases

Catalysing busway and EWR commitment

Maximising new opportunities

Establishing bus and active transport corridors which connect with emerging EWR station and new local centres to support sustainable travel patterns at an early stage and as behaviours evolve.

Extending busway services into Extended Cambourne utilising existing infrastructure and connections over A428.

Maximising benefits of EWR within Extended Cambourne and opportunities for new crossings over A428 to better integrate existing Cambourne. Enhanced regional connectivity is a key attractor for new residents, businesses and investment.

7.2 Resilience

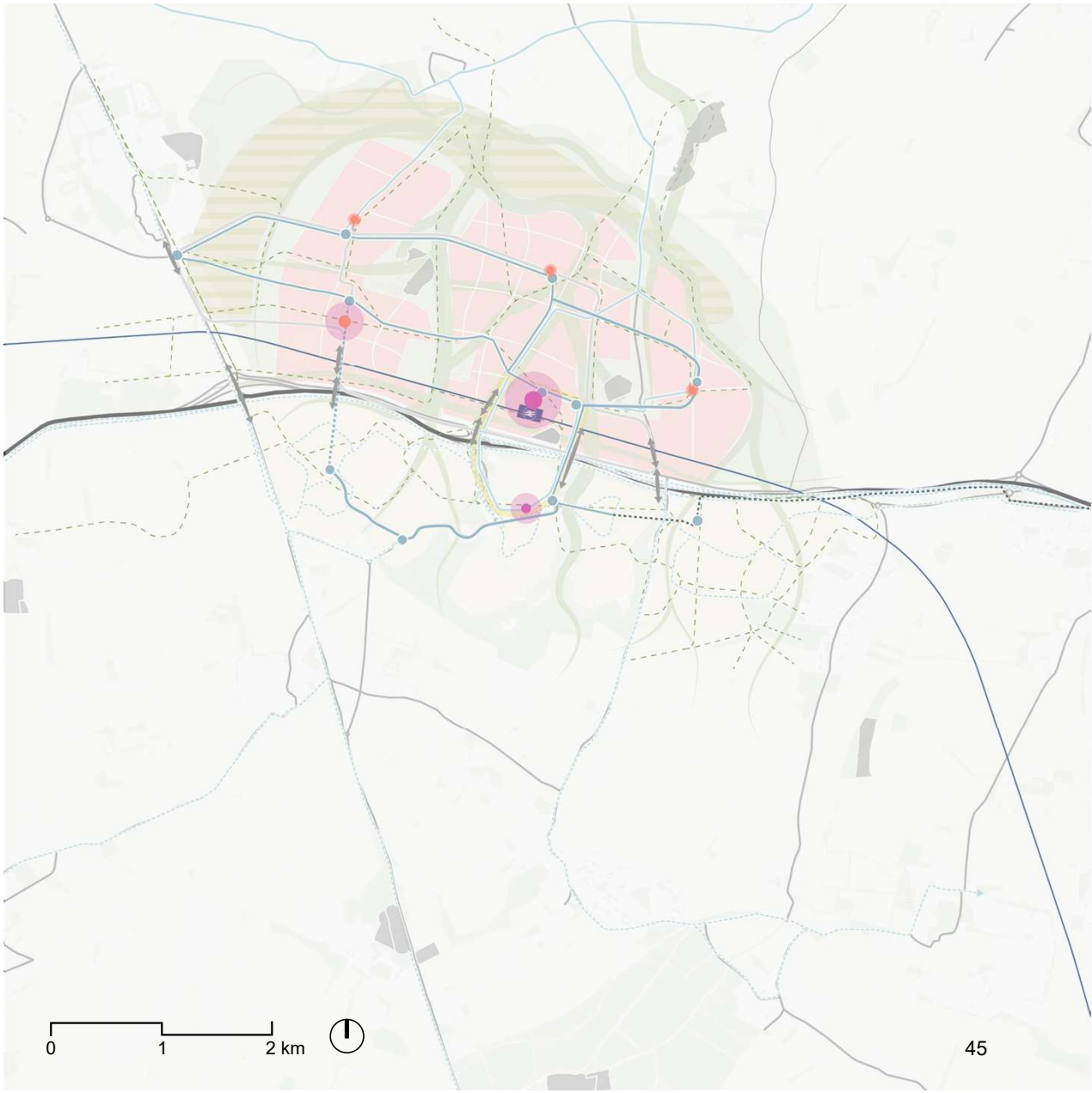
Managing uncertainty

The delivery of CtoC and EWR are major infrastructure moves that will take years to deliver. To realise the opportunities they present for Extended Cambourne, early delivery phases must align to a clear vision for the future but retain the flexibility to adapt and respond to design, delivery and political challenges and well as fluctuations in market confidence and potential delays.

Travel behaviours will therefore evolve as Extended Cambourne's transport networks, shops, schools and other services and facilities develop over time. Early development phases will look and feel very different to later ones, but a clear vision will ensure that impacts are managed appropriately at each stage, so that the full benefits of CtoC and EWR can be captured over time.

The resilience of the A428 and wider Strategic Road Network will be a key concern for National Highways. Extended Cambourne must therefore minimise car-based trips by prioritising investment in high-quality sustainable transport networks with the capacity to support growth and reduce pressure on surrounding villages, junctions, and local roads.

More detailed transport modelling will need be undertaken to establish varying levels of development scenarios which will require differing levels of supporting transport infrastructure.



8 Summary and Next Steps

Summary

Role of Transport Planning in Unlocking Development in Extended Cambourne

This report sets out how a focus on transport can help Extended Cambourne maximise its potential to deliver new homes and jobs, while making best use of major new infrastructure — notably East West Rail and the CtoC Busway.

Through a review of existing evidence and a detailed analysis of local context, we developed a transport strategy vision and supporting design principles that shaped the emerging Spatial Framework.

A key part of the work was the development of a Travel Demand model which tested two scenarios — a business-as-usual baseline and a vision-led approach — using forecast homes and jobs. This revealed the scale and pattern of movements expected from Extended Cambourne, helping to inform the number and location of crossings over the Strategic Road Network and EWR, and to shape the design of walking, wheeling, cycling, and public transport networks.

Key findings from this work include:

- Movement patterns will need to be multi-directional, with strong links needed not only to Cambridge, but also to local villages, reinforcing the need for good regional and local connectivity. There is a need to influence new strategic infrastructure, both its alignment and location to maximise the potential for growth at Extended Cambourne.
- There is a significant opportunity to reduce car dependency, particularly through early investment in high-quality public transport provision such as an extension to CtoC, walking, wheeling and cycling routes, and co-locating homes, jobs and services. The details set out within the Spatial Framework and this Transport Vision have maximised this potential, however there is still some clear disparity between the constraints placed on the development in terms of trip budgets and landscape linkages and the ambition for the site.
- Strategic infrastructure must be carefully integrated into the local network — ensuring the busway and rail station support seamless local access rather than acting as barriers. Integration is crucial and needs to be prioritised to maximise its potential, and transport needs to be at the forefront of any planning, urban design or masterplanning discussions.
- Travel demand can be significantly shaped by the design of the place, with the vision-led scenario showing a shift towards more sustainable modes and more internalised trips compared to business-as-usual. Transport is a crucial part of this design and walkable neighbourhoods and the advice present within this strategy should be closely followed to minimise the need to provide costly mitigation measures that only provide further vehicle-based capacity.

Mode-specific proposals for regional and local connectivity have been developed, presented on an indicative timeline to reflect how the transport vision could be delivered over time, recognising that infrastructure planning carries uncertainty.

In summary, the transport strategy defines the requirements for a sustainable, connected place — enabling most everyday journeys to be made by walking, wheeling, cycling or public transport. It seeks to reduce the need for expensive and complex road capacity enhancements by supporting behaviour change through place-led movement design. It balances the ambitions to deliver growth, protect the environment, and prioritise sustainable movement across the full development timeline.

Next Steps

Recommendations to progress

This work has sought to set out the key vision and principles for the Spatial Framework. There is further work needed beyond this high-level strategy for a full understanding of the transport requirements and impacts to have a robust evidence base to support a site allocation of this significance.

The additional work required is:

- Further modelling - This Transport Strategy has assumed high levels of trip internalisation and sustainable mode shares, based on spreadsheet-based models. Further modelling using appropriate modelling techniques that align with those being used to inform the wider local plan should be undertaken to fully understand travel behaviours and ensure that the appropriate trip budget for Cambourne can be met, including phasing runs to understand what can be delivered before EWR is operational.
- Identification of any wider mitigation measures that may be required or could be proposed to accommodate further growth or reduce impact on the surrounding highway network.
- Further integration of modelling work with EWR and discussions around specific car parking provision related to the station and how that may impact on cumulative trip budget for the site.
- Greater depth and level of detail on active travel, public transport and highway design to inform and complement the GBI Framework and resolve conflicts with Dark Corridors.
- More detailed assessment of journey times and benefits associated with CtoC Busway extension in order to develop a clear strategic narrative and understand delivery priorities, including phasing before EWR, to support any future proposals for extension.