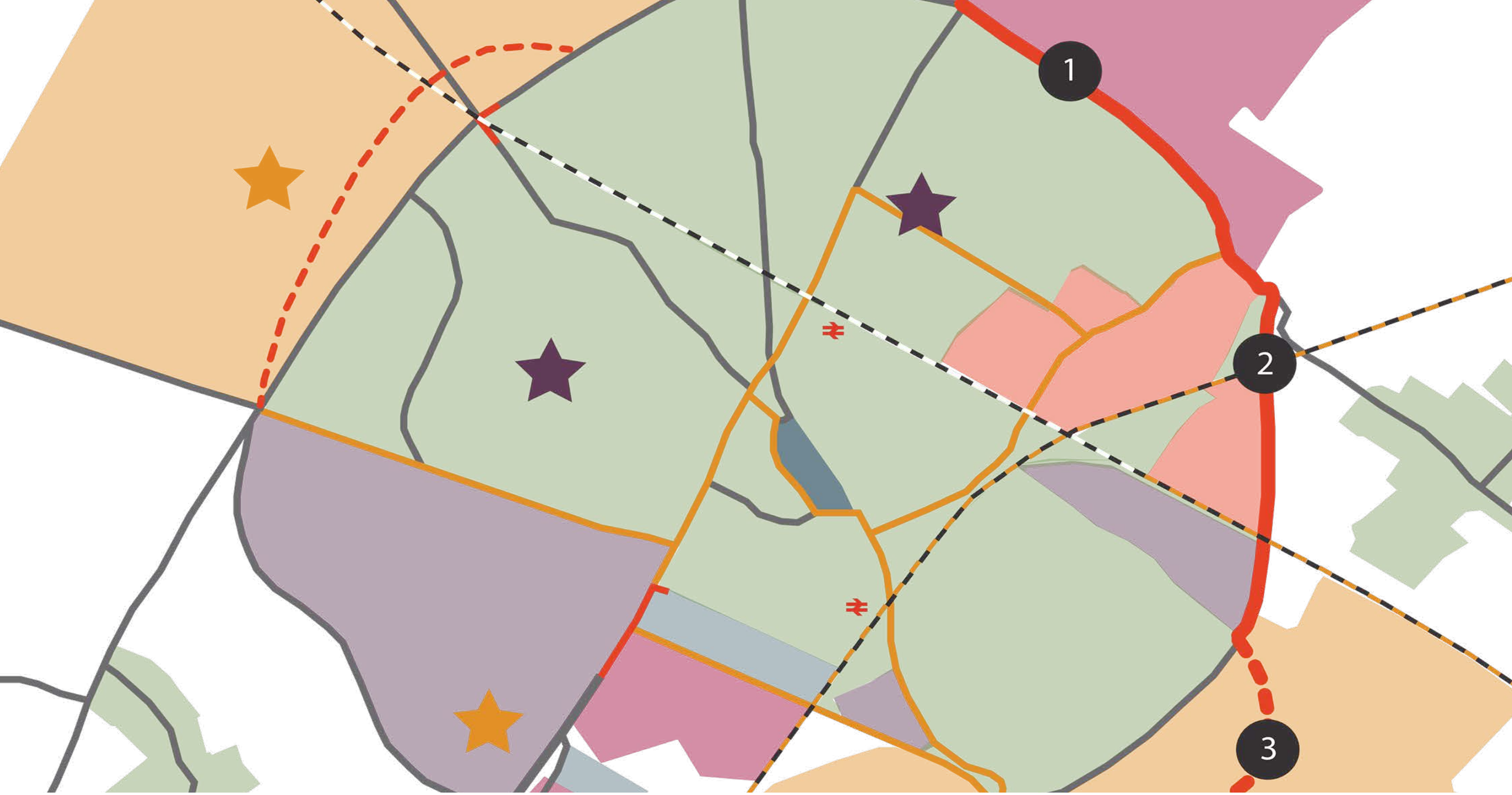


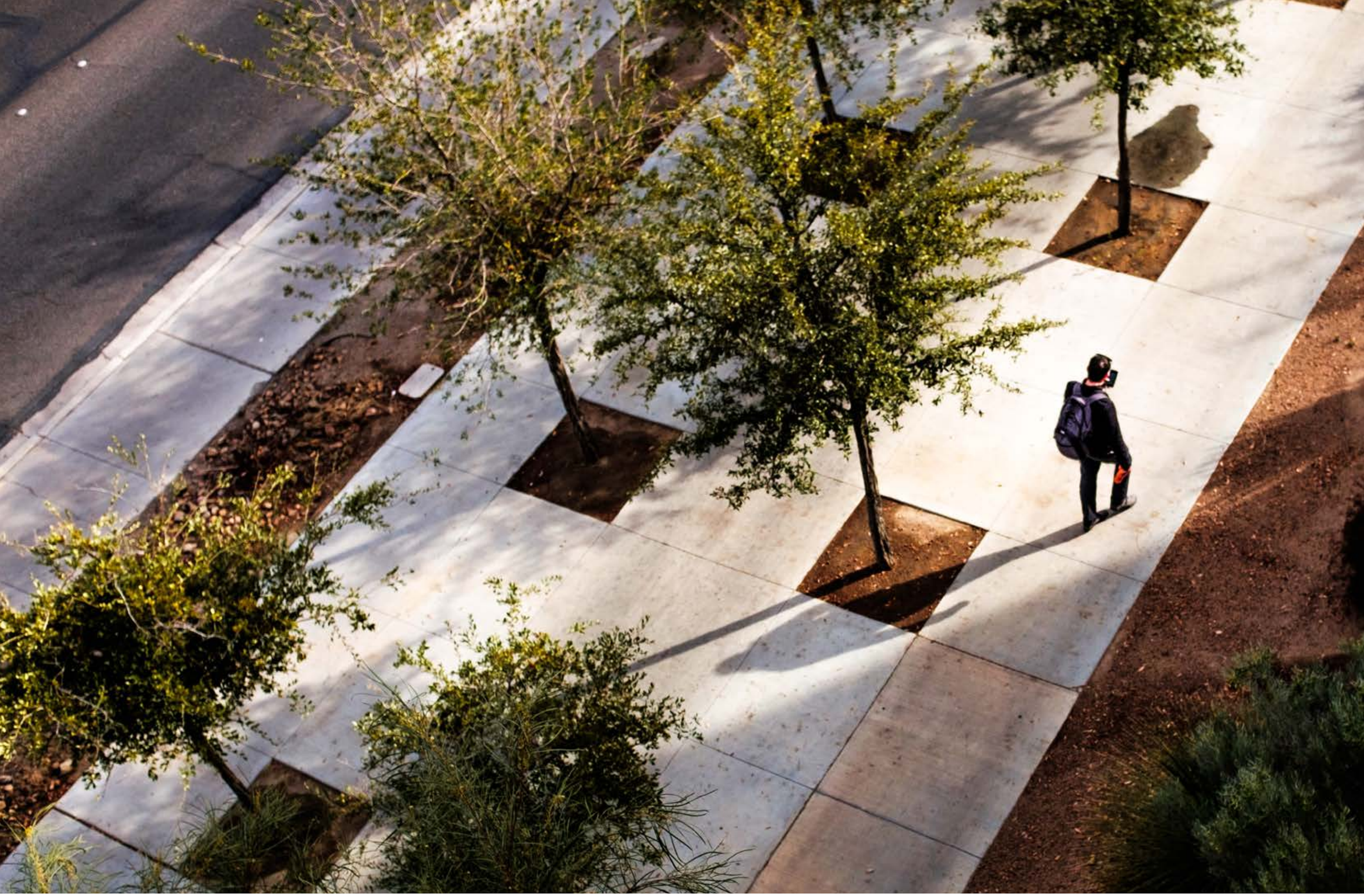
BICESTER EASTERN CORRIDOR

DRAFT DESIGN STRATEGY V4B

14 AUGUST 2018

SYSTRA

CONTENTS



1 | Introduction

OVERVIEW

This document focuses on design for improvements to the Eastern Corridor, as identified here, and building upon previous guidance set out in the accompanying Baseline Report.

This route has an important role to play in removing strategic through-traffic trips from the town centre. However, it also provides linkages to two major growth sites: Wretchwick Green and Graven Hill.

There is also potential for the existing route to be diverted through these areas- Links “F” and “H”- with HGVs restricted to the current alignment - Links “D” and “E”. This rebalancing of vehicle movements provides the opportunity to soften the road between Wretchwick Green and Langford Village, which would support aims to encourage active travel between new and existing neighbourhoods, and Bicester generally.

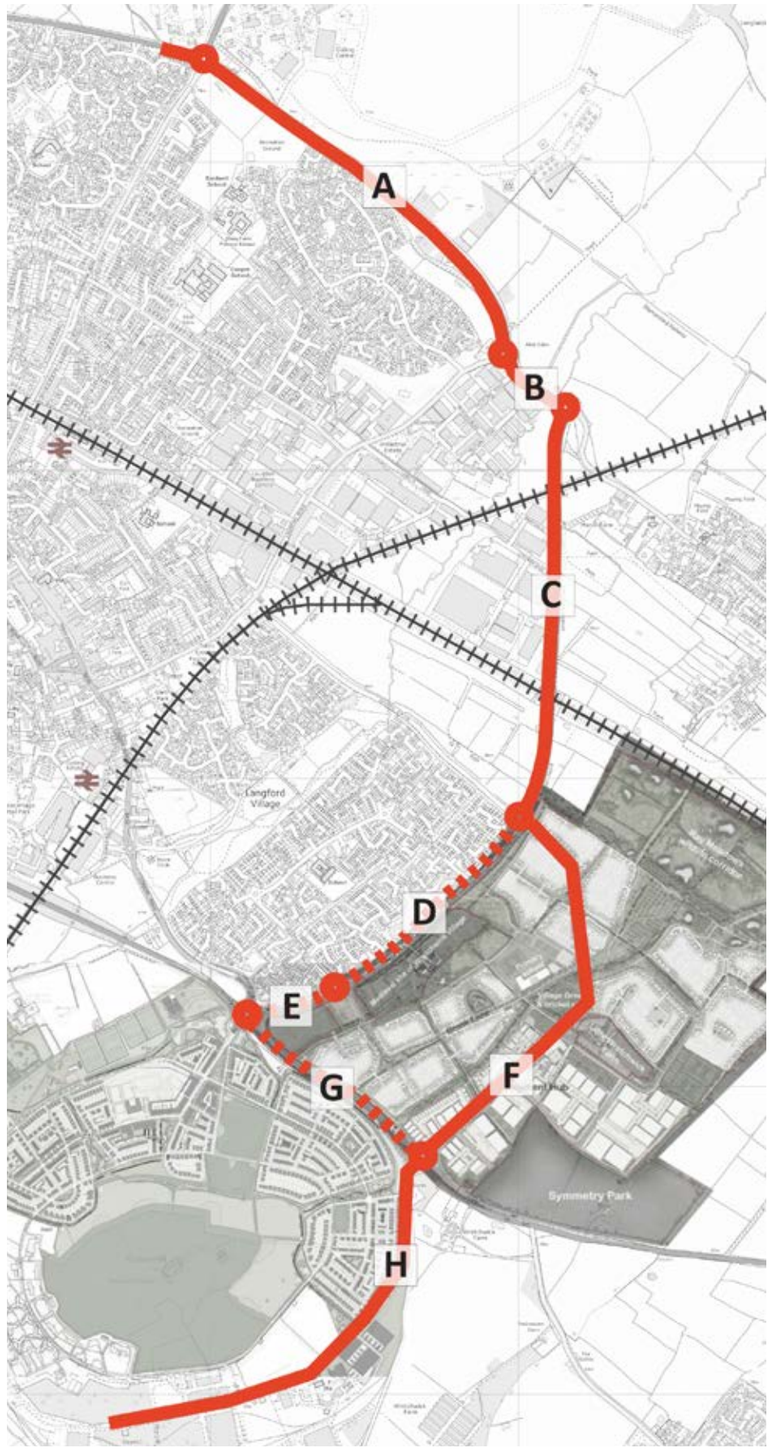
It is therefore important that easy pedestrian and cycle linkages are possible across the route to ensure good connectivity to the town centre, and encourage local journeys to be made actively.

This document has been informed by the outcomes of public engagement exercises held in 2016, and more recently two stakeholder workshops held in February 2018, and a Member workshop held in March 2018. Key findings will be referenced on the following pages.

Reference is also made to the Bicester Sustainable Transport Strategy (2015), Cherwell Local Plan, Local Transport Plan 4, and Oxfordshire’s Walking and Cycling Design Standards, 2017. The Sustainable Transport Strategy makes clear that the Eastern Corridor will witness increased trips as through traffic is discouraged from taking routes through the town centre. The impact of this on walking and cycling will require careful consideration, and it will be necessary to ensure that improvements in the Corridor:

- Promote sustainable travel whilst balancing the needs of all travel modes
- Are resilient and adaptable to changing demands
- Can be delivered incrementally
- Maintains the orbital route as the natural choice for through traffic
- Is high quality and attractive
- Integrates new neighbourhoods with the town centre

The aim of this Design Strategy is to balance these needs and set out a practical way forward, strengthening the collaborative work done previously, and creating a Design Strategy that is realistic and responds to local context.



2 | Current Context

WALKING AND CYCLING

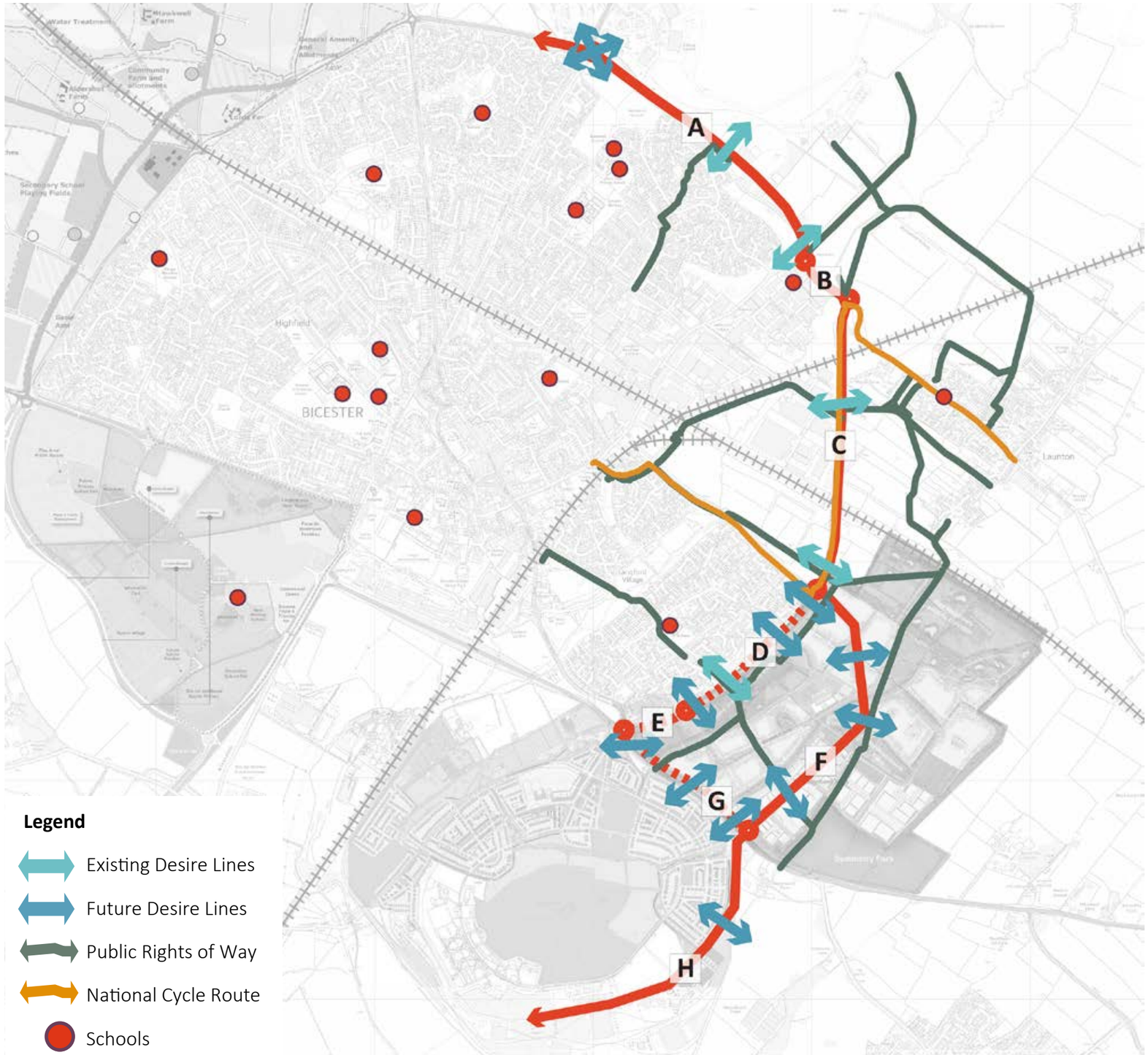
The accompanying Baseline study has concluded that the peripheral route creates a barrier to walking and cycling, being challenging to cross, and the quality of walking and cycling routes along it are variable.

Further, Public Rights of Way (PRoW) and the National Cycle Route (NCR) both interact with the route, and create important desire lines for pedestrians and cyclists that are currently not well catered for. All Links within the study area have a role to play in maintaining and enhancing walking and cycling connectivity from the existing town into new neighbourhoods and the countryside beyond, and additional desire lines are anticipated in the future as shown here.

There are also a number of schools within the vicinity of the Eastern Corridor, and additional educational facilities are planned as part of the new neighbourhoods. It will imperative that students can safely cross the road to enable them to travel to and from school actively.

The existing PRoW that run through Wretchwick Green need to be retained and enhanced, and also extended into Graven Hill. Links D and E will be particularly important for providing safe and comfortable crossing points to create seamless connectivity between the new neighbourhoods and the existing town.

The Oxfordshire Walking Design Standards (2017) give pedestrians greatest priority, followed by cyclists, public transport, and other vehicles. The document sets out how footpaths and shared use routes should be designed. An accompanying Cycling Design Standards gives similar information relating to the design of an and off-carriageway cycle infrastructure.



TRAFFIC CONGESTION

Work undertaken as part of the Baseline review found that traffic flow on the Corridor in the AM and PM peaks does not produce high congestion levels or delay, and can be seen to operate efficiently.

Traffic Speed

- Fast
- Moderate
- Slow
- Very Slow

CONGESTION 8AM - 9AM

CONGESTION 5PM - 6PM

EXISTING AND FUTURE TRAFFIC FLOWS

Data from Oxfordshire County Council Strategic Model

SCENARIO 1: EXISTING

Existing flows are as follows, totals combine both northbound and southbound movements:

AM PEAK

LINK	CARS	HGVS	LINK TOTAL
A	2003	111	2114
B	1620	99	1719
C	1144	88	1232
D	1087	90	1177
E	819	90	909
G	1824	152	1976

PM PEAK

LINK	CARS	HGVS	LINK TOTAL
A	1600	52	1652
B	1638	33	1671
C	1165	33	1198
D	1088	45	1133
E	1355	52	1407
G	2018	71	2089

SCENARIO 2: FUTURE FLOW WITHOUT SEDR

Predicted future flows ***without*** the South East Distributor Road are as follows, totals combine both northbound and southbound movements:

AM PEAK

LINK	VEHICLES	% CHANGE TO 1.
A	2343	11%
B	3105	81%
C	2724	121%
D	1089	-7%
E	1204	32%
F	1919	n/a
G	2078	5%
H	1143	n/a

PM PEAK

LINK	VEHICLES	% CHANGE TO 1.
A	2765	67%
B	2960	77%
C	2598	117%
D	1256	11%
E	1626	16%
F	1816	n/a
G	2706	30%
H	1404	n/a

SCENARIO 3: FUTURE FLOW WITH SEDR

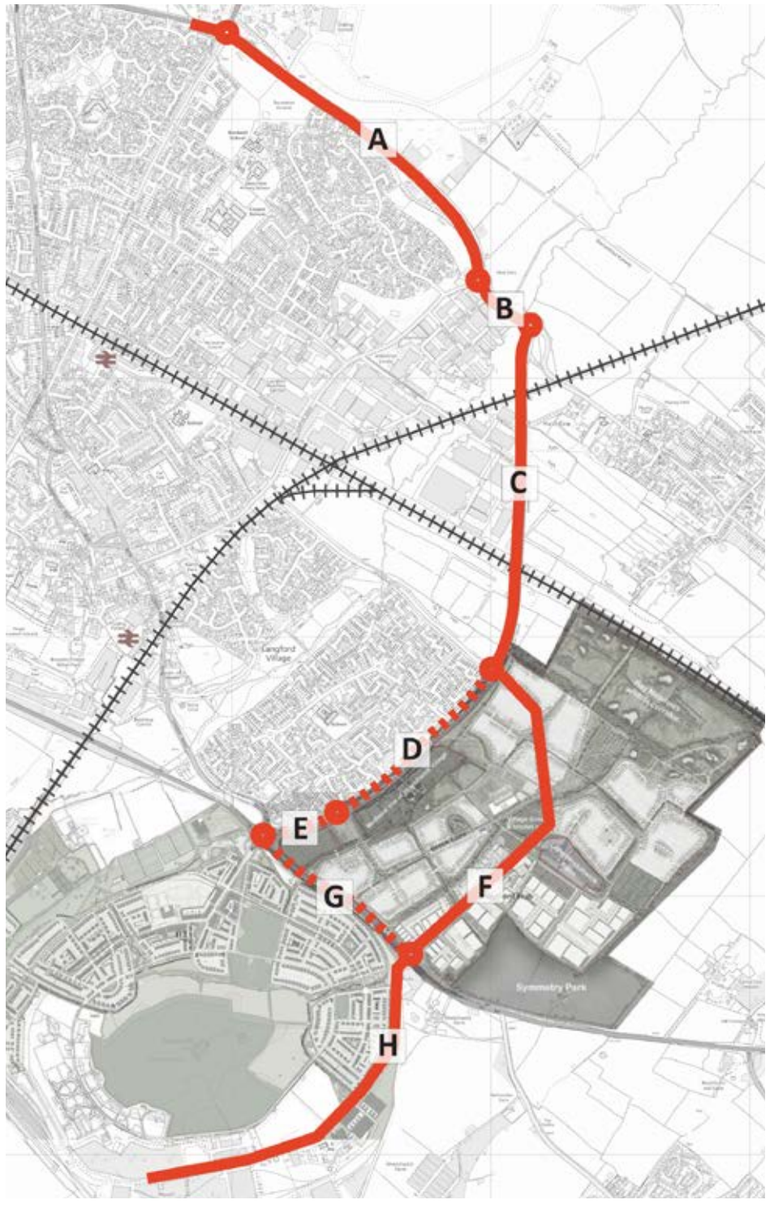
Predicted future flows ***with*** the South East Distributor Road are as follows, totals combine both northbound and southbound movements:

AM PEAK

LINK	VEHICLES	% CHANGE TO 1.	% CHANGE TO 2.
A	2140	1%	-9%
B	2703	57%	-13%
C	2266	84%	-17%
D	1042	-11%	-4%
E	1087	20%	-10%
F	1350	n/a	-30%
G	1265	-36%	-39%
H	1856	n/a	62%

PM PEAK

LINK	VEHICLES	% CHANGE TO 1.	% CHANGE TO 2.
A	2205	33%	-20%
B	3070	84%	4%
C	2588	116%	-1%
D	1094	-3%	-13%
E	1309	-7%	-19%
F	1722	n/a	-5%
G	1617	-23%	-40%
H	1782	n/a	27%



It can be seen that Link C, which is shared with the National Cycle Route, is set to experience the greatest growth in vehicle movements in both future scenarios.

Link D is the only existing Link anticipated to see a reduction in vehicle movements in future scenarios.

Future increases in flows throughout the Corridor could in part be mitigated through the delivery of the South East Perimeter Road (SEPR) as shown in Scenario 3. However, flows still remain significantly higher than the existing in Links B and C in both the AM and PM peaks.

At the workshops (see Appendix A), it was suggested that the study area should be extended, particularly Link H, which should continue westwards and connect with the A41 to provide a more direct route to the motorway. This would enable the improvements highlighted in Scenario 3 to be realised.

The extension of Link H to connect up to A41 was considered in the Bicester Movement Study 2013, where a number of options where identified. Link H forms a consistent part of the options 2C and 3 identified in that study. However, the details of routing of any final link connecting H up to the A41 is subject to further work, and rests outside the scope of this report.

PUBLIC TRANSPORT

RAIL

A shift to greater public transport use will be facilitated through the enhancement of rail services, for example with the introduction of East-West Rail, bus services and park & ride. One result of this is the need to examine alternatives to the existing level crossings, which will be subject to increased closure, from for example, East West Rail. There are proposals for the bridging of the level crossing on Link C, and furthermore, options for London Road crossing are also being considered.

BUS

There are a range of bus services within Bicester. Some are commercially viable, and some are subsidised. Providing local bus routes to serve the neighbourhoods will be an issue as high frequency services through Bicester's neighbourhoods are likely to be commercially challenging. Interurban bus services running through Bicester on its main streets are more likely to be able to provide a frequency that provides a real alternative to the car and be viable.

The Bicester Sustainable Transport Strategy (2015), found that bus provision is confusing, with some routes operating very infrequently, and other routes being under-used. The most popular route was found to be the S5, running every 15 minutes to Kidlington and Oxford.

Public transport improvements in particular should better link residents and workers to the town centre and railway stations. A Quality Partnership should be considered, working with the key bus operators to deliver a bus network that is viable in the medium to longer term.

It is also important that walking routes to bus stops are safe and attractive, with comfortable waiting facilities provided.

OTHER VEHICLES

The Bicester Sustainable Transport Strategy (BSTS) (2015), found that the peripheral route to the north and east of the town experiences traffic flows of between 16,000 and 19,000 vehicles per hour.

Of the c86,500 trips per day, approximately 69% are taken by private vehicle, and with the development of new neighbourhoods around Bicester, there is a clear need to encourage a switch to more sustainable modes of travel. The BSTS found that 40% of all journeys are less than 3km, a distance that is within the scope of most pedestrians and cyclists.

It is anticipated that improvements to the peripheral route to increase highway capacity will provide opportunities to deliver sustainable links to the new neighbourhoods. This is seen as part of a wider movement strategy on the eastern side of the town that will accommodate through traffic whilst improving connectivity to the town centre.

As through traffic is increasingly encouraged to use the peripheral route, some Links within the Eastern Corridor will need to be upgraded to dual carriageway, however, this will need to be supported by the delivery of the south east distributor road.

MOVEMENT STRATEGY

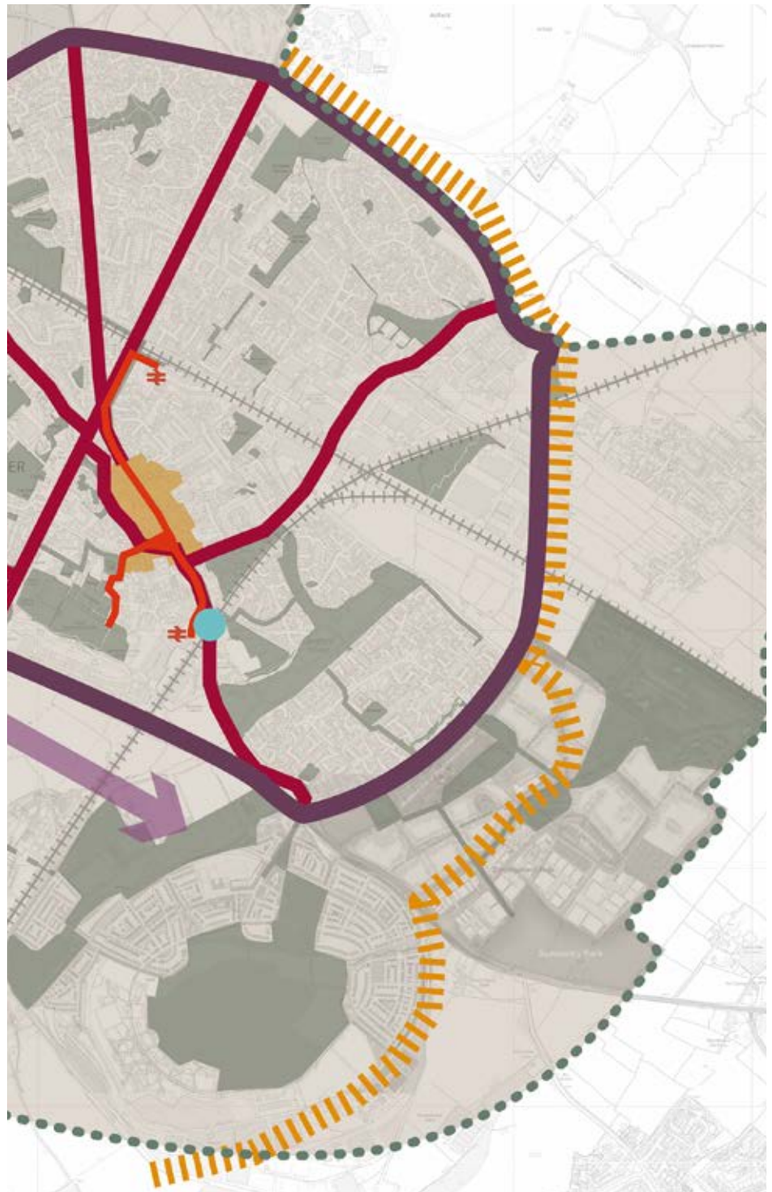
The Movement strategy for the town identifies the Corridor as an attractive peripheral route with high quality streetscape.

It is considered important that walking and cycling are well catered for, whilst ensuring the route can accommodate additional vehicular capacity.

The movement strategy aims to push through-traffic to the peripheral road. However, in the future this road will no longer be peripheral as developments expand the town beyond it. Therefore, a boulevard approach and treatment to this road is proposed so that it can integrate into Bicester's urban fabric, and not act as a cause of future severance.

Legend

- Within this area all neighbourhood streets are attractive and low speed (20mph), and walking and cycling feels safe and attractive for all
- Core area of high quality destination public realm where it's a pleasure to spend time, which connects the town centre to Bicester Village and the stations and is at the heart of the 'Garden Spine'
- A connected network of diverse and beautiful green spaces where walking and cycling and spending time is a pleasure for all and which connects neighbourhoods to each other and the town centre both on foot and by bike
- The peripheral route now forms an attractive boulevard which has adequate vehicular capacity, a high quality streetscape, and is attractive to walk and cycle along and across. Through traffic is encouraged to use this route rather than travel through the town
- Attractive busy streets where walking and cycling is a pleasure, speeds are low and through traffic other than buses is discouraged
- This key severance between neighbourhoods is addressed for people walking and cycling
- Work to ensure long term access by all modes to the town centre is related
- Additional traffic capacity is provided and through traffic concentrated on a peripheral route which is designed as an attractive urban boulevard



LANDSCAPE AND HERITAGE CONSTRAINTS & OPPORTUNITIES

There are three Scheduled Ancient Monuments (SAMs) and one Conservation Area that could potentially be affected by this Strategy:

SAMS:

1. RAF Bicester: The monument includes the southern bomb stores group and a series of airfield defence structures forming part of the former RAF Bicester Airfield site
2. Wretchwick Deserted Medieval Settlement: The monument, which falls into two areas immediately north east and south west of Middle Wretchwick Farm, includes the remains of Wretchwick medieval village and its associated earthwork boundaries
3. Alchester Roman Site: The monument includes the buried archaeological deposits of a Roman parade ground, a Roman access road and part of a temporary camp

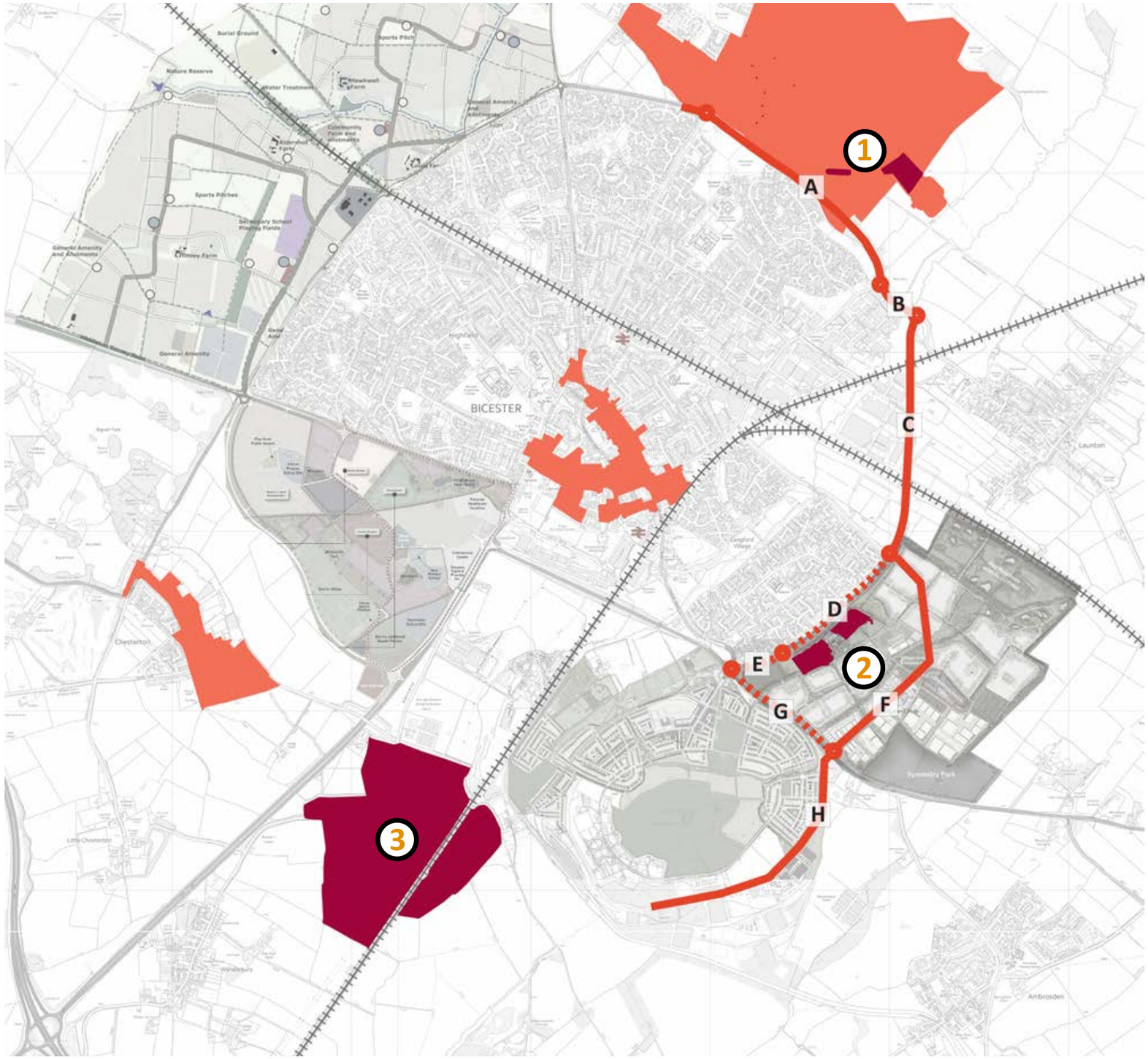
CONSERVATION AREA:

1. RAF Bicester

The Conservation Area covers;

- The technical site;
- The domestic site, including the pre-war married airmen's housing and the former Officers' Mess (now Cherwood House) and former WRAF officers' mess (now Brashfield House) on Buckingham Road
- The remaining flying field including the remaining defensive structures on and adjacent to the flying field, which equates to the 1939 boundary of RAF Bicester.

The spatial relationships within and between these areas, together with the views across the flying field to open countryside beyond are also important aspects of the character of the area worthy of conservation.

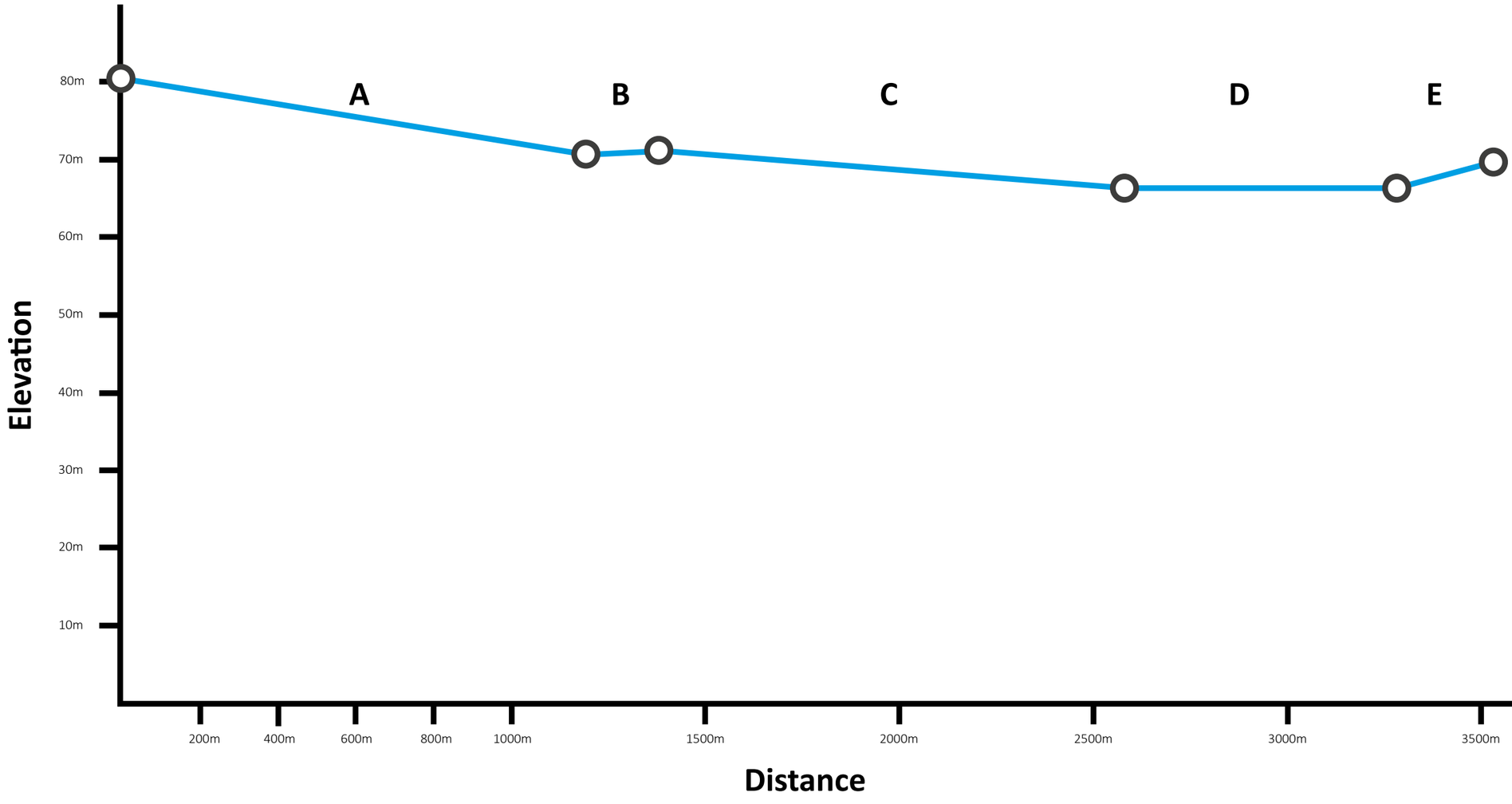


TOPOGRAPHY

The Corridor gently falls in elevation from north to south, from 81m at the Buckingham Road / Skimmingdish Lane roundabout in Link A to approximately c70m at the A41 / A4421 / London Road roundabout at Link E.

This equates to a change in elevation of approximately 11m.

This gradual change in elevation over such a long route is not considered to be detrimental to walking and cycling.



PERSONAL INJURY COLLISION DATA

The number of Slight and Serious accidents on the Corridor since 2013 have been plotted here.

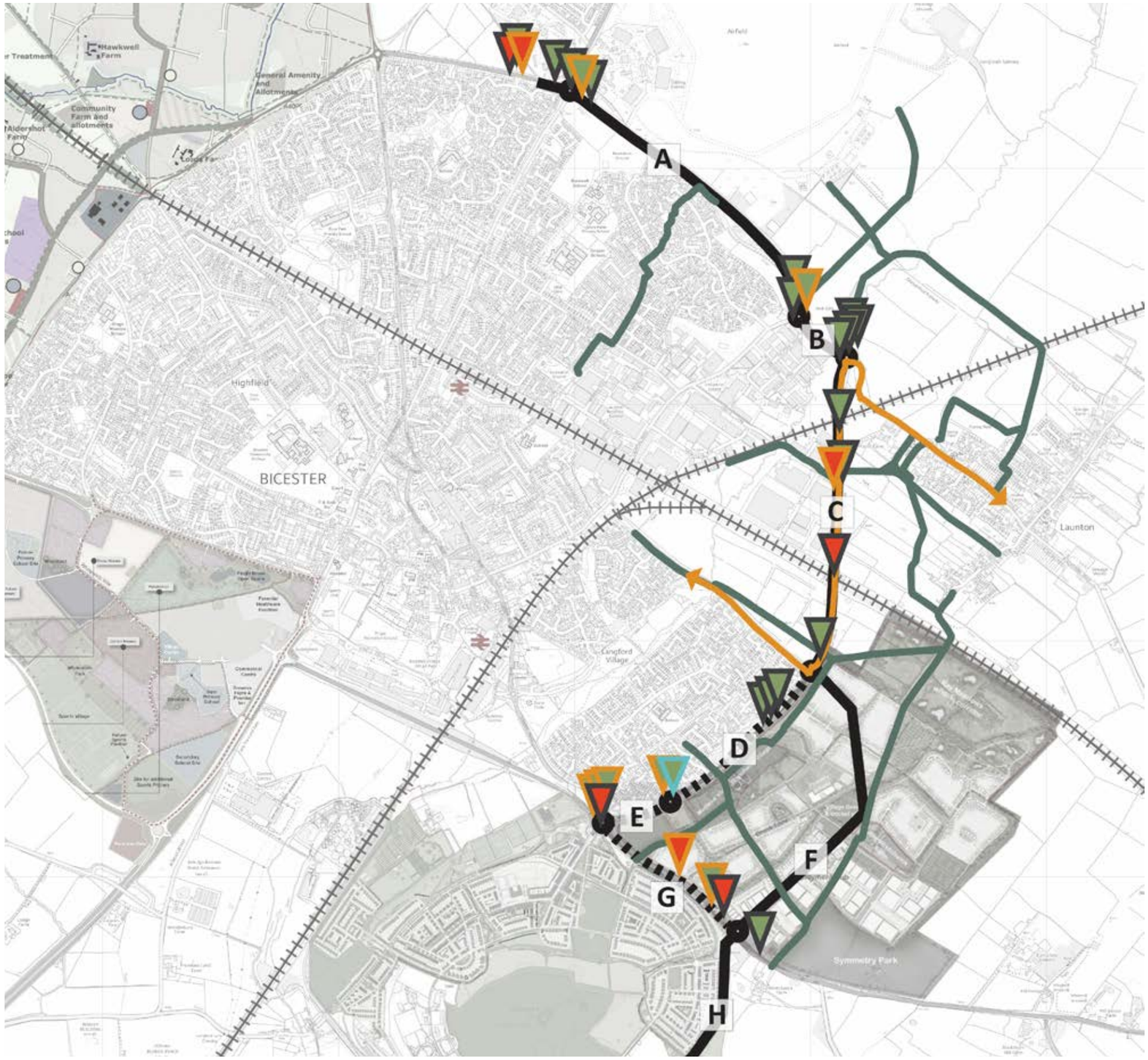
Not surprisingly, the majority of incidents occur at junctions, in particular collisions involving cyclists. Junctions where cyclists have been involved in accidents include:

- The A4421 / Peregrine Way roundabout
- The A4421 / London Road roundabout
- The A4421 / Buckingham Road roundabout

Link C forms part of the National Cycle Route, and there has been one Serious accident on this stretch involving a cyclist as well as four other incidents involving other vehicles.

Link D has experienced a cluster of collisions around the easterly Peregrine Way junction.

Given the growing need to improve connectivity for walking and cycling across Links D, E and G in particular, highway design has a significant role to play in reducing the likelihood of accidents.



LOCAL FLOODING & DRAINAGE ISSUES

There are three flood zone levels identified by the Environment Agency. For clarity, those areas not specifically identified as being within Flood Zones 2 or 3 are automatically within Flood Zone 1:

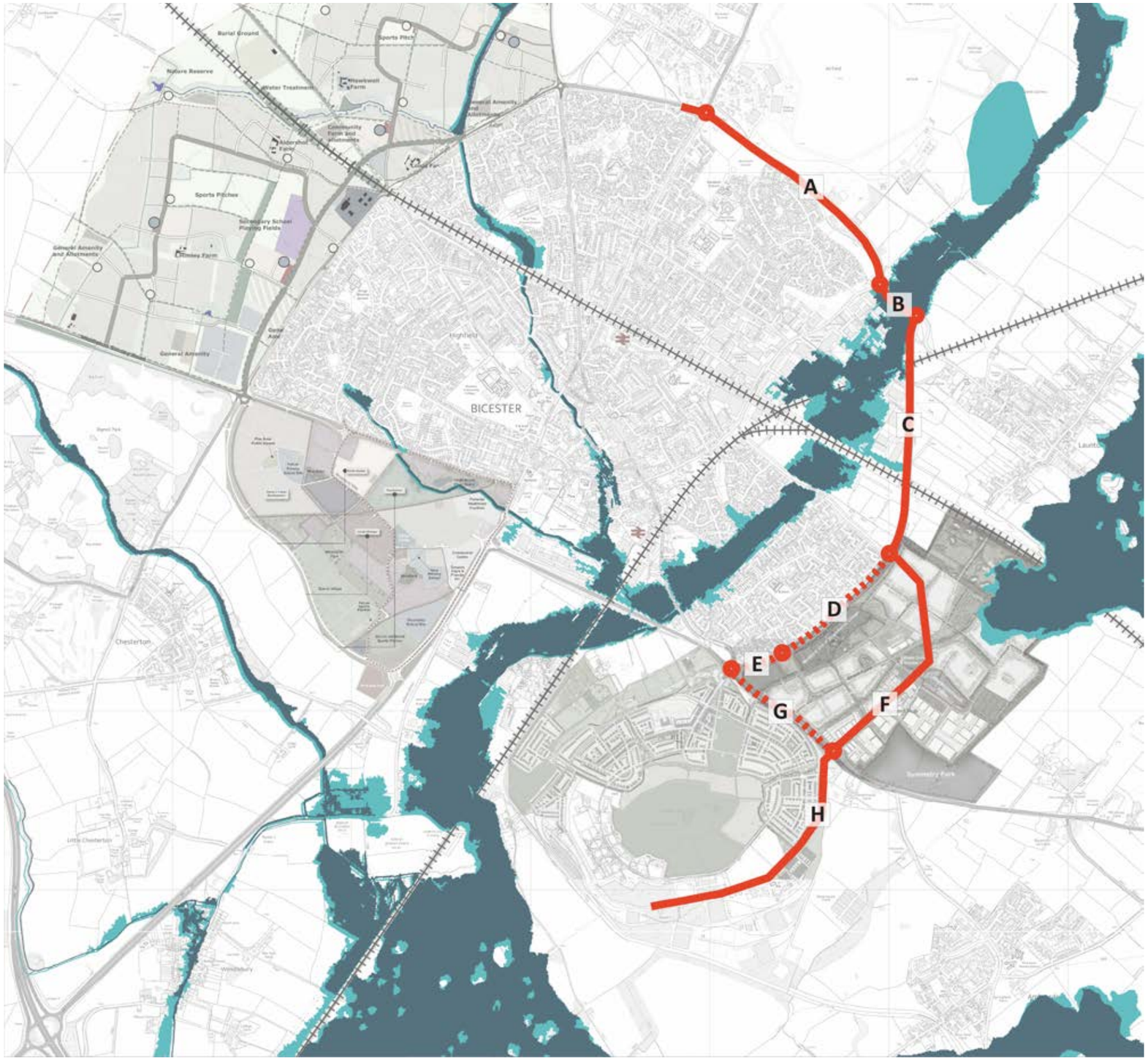
Flood Zone 1- land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)

Flood Zone 2- land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year

Flood Zone 3- land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year

It can be seen that Link B is the most likely to be affected by flooding, with the adjacent parts of Links A and C also at risk.

It is anticipated that Link H will ultimately continue west and connect to the A41. This area is also at high risk from flooding. Road design in these areas will need to ensure that flooding can be mitigated, utlising technologies and engineering solutions that will slow surface-water run-off and improve drainage.




CLEAR

3 | Eastern Corridor Design Strategy

INTRODUCTION

The Eastern Corridor is currently a barrier to pedestrians and cyclists. It also lacks variety and distinctiveness, which creates a significant challenge to legibility around the town.

This Design Strategy expands this idea and considers that as the character and context of the Corridor varies from Link to Link, different design approaches need to be taken along its length. Future land uses on the eastern periphery especially need to be borne in mind to ensure the Corridor is designed to encourage active travel journeys to and from the town centre.

Legibility can be achieved through colour variation, variegated planting and other landscape treatments that could be used around the different sectors of the Corridor. This would have the effect of creating a changing character around the peripheral route which will reflect the existing and planned communities in each location and create an exciting and engaging environment in the route. This could be further enhanced by frontage development from forthcoming planning applications to ensure placemaking along the route is a priority whilst recognising its role as a key traffic corridor.

The provision of consistent and attractive cycle and walking routes around the whole perimeter corridor is proposed as a means of encouraging people to walk and cycle.

The Strategy reflects aspirations for the Corridor to accommodate increased vehicular capacity, in order to draw through-traffic away from the town centre. This has clear implications for other road users in terms of crossing the Corridor or travelling along it, and in some locations additional land will be required to accommodate widening.

A balance has been struck in terms of carriageway widths and speed limits, in that for the bulk of the route, the speed limit will be 40mph. Where it passes through local centres or residential areas, a lower speed of 30mph is proposed. All Links have been designed to accommodate two-way HGV movements.

Signalised crossing points will be needed to support pedestrian and cycle desire lines in all Links given the speed and volume of traffic and its potential to intimidate vulnerable pedestrians and cyclists.

CORRIDOR AIMS

The illustration opposite indicates how this Urban Edge could be softened.

In addition it is recommended that:

- Speed limits are reduced to 30mph-40mph
- Carriageway widths remain sufficient to accommodate large vehicles, with dual carriageways introduced / retained on Links A, B, C, and E
- Segregated facilities are provided for walking and cycling
- Signalised crossings for pedestrians and cyclists are provided at, or as close as possible to, desire lines to support convenient active travel journeys
- Sustainable Urban Drainage Systems (SUDS) are incorporated
- The streetscape is attractive, to be designed as far as possible as a tree-lined boulevard. In the short term, the corridor acts as a peripheral road. However in the future, with the potential for development on the outer side of the corridor, it will be embedded within the urban fabric and a boulevard would be appropriate.
- Seating is provided at regular intervals- at least every 200m

1. To enable legibility and create interest sections of the can be given distinct characters through design including lighting, signage, street furniture, banners, public art and the design of new development, whilst at the same time accommodating the volumes of traffic required.

CREATING VARIETY AND DISTINCTIVENESS

The varied character given to the arterial busy main streets can help distinguish different sections of the peripheral route. For example this section, joining the planned South East Bicester site and the existing residential dwellings at Langford Village could draw inspiration from Wretchwick Medieval Village, a key heritage asset for Bicester. Other segments could draw on nearby developments.

SAFETY CONSIDERATIONS

The ensure the actual and perceived safety of pedestrians and cyclists, as well as improving permeability across the peripheral route, signalised crossing points are required at the desire lines for these users. Overlooking of the route from new development should also be provided to ensure passive surveillance, in particular at desire lines, to ensure walking and cycling feels safe during the day and night .

2. Segregated and high quality pedestrian and cycle routes encourage walking and cycling along the route, connecting to high quality routes into the town centre.

STAKEHOLDER SUGGESTIONS

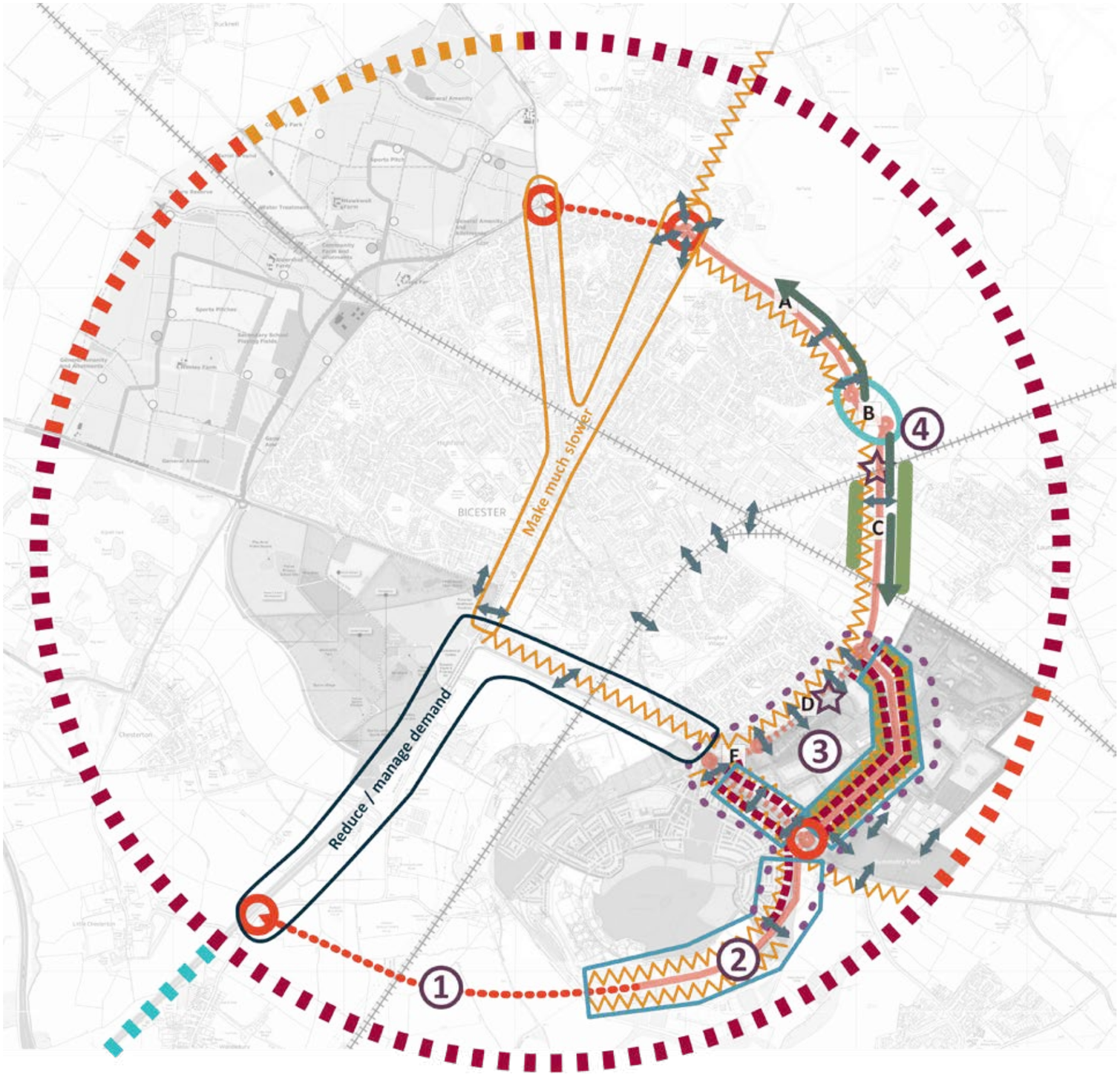
The design outcomes identified at the second Stakeholder workshop held on 15 February 2018 have been combined into this composite illustration.

These ideas have informed the Design Strategy for the Eastern Corridor.

Design Strategy Legend

- Gateways into Bicester
- Edges- walking and cycling along road
- Edges- development overlooking road
- Beauty / Streetscape- Landscape
- Beauty / Streetscape- Public Art
- Crossings- Formal, plus desire lines
- Crossings- zones where people should be able to cross safely
- Zone where highway design / engineering manages speeds
- Improved Capacity
- Wildlife
- Extension to Study Area

- 30mph
- 40mph
- 50mph
- 70mph



1. (No explanation given)
2. More urban. Vehicle feeder roads. Space for central reservation for uncontrolled crossing points.
3. Key area. Main pedestrian / cycle. Consider within context of wider links. Link “E” should have pedestrian / cycle priority? Would limit central Bicester traffic.
4. Strengthen green buffer and link. Separate ?

PRECEDENTS

Passeig De St Joan, Barcelona (source: unknown). Public realm improvements sought to improve pedestrian priority and develop a new urban green zone. This example demonstrates how a busy dual-carriageway layout can be treated to accommodate walking and cycling and accommodate active travel links across and along it.

Maid Marion Way, Nottingham (source: © 2018 Bluesky, Infoterra Ltd and Bluesky, © 2018 Google). A busy dual carriageway with two-stage straight-ahead crossings, including a crossing that follows the pedestrian desire line rather than sitting perpendicular to the traffic flow.

Kensington High Street, London (source: © 2018 Google). Central median supports informal pedestrian crossing movements, with cycling visually enforced. Staggered crossings replaced with straight over crossings.

SPEED LIMITS

Appropriate speed limits for the Eastern Corridor need to be informed by a number of factors:

There are several public rights of way crossing the Eastern Corridor, and the National Cycle Route runs along Link C.

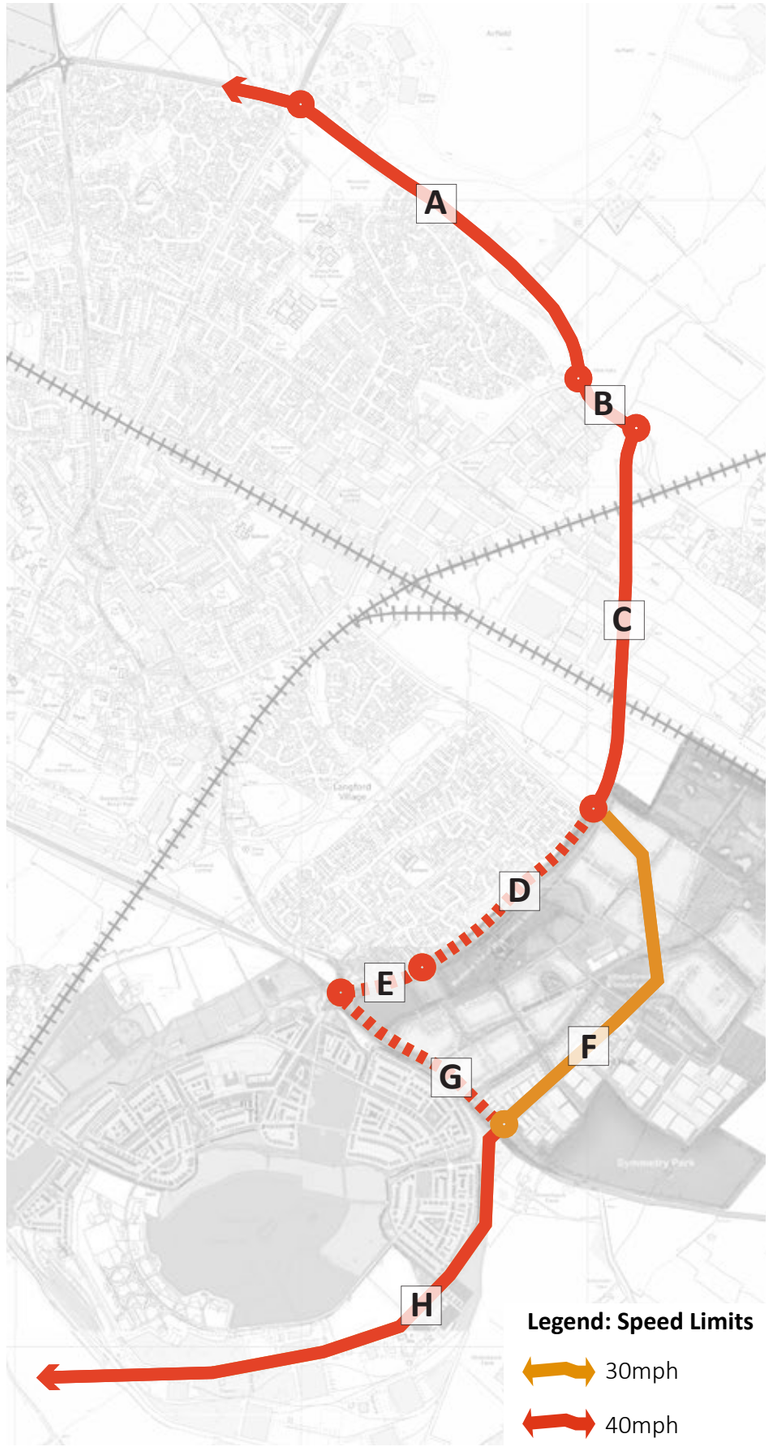
This has created a number of desire lines that need to be accommodated in future development within the strategic sites, and they should also influence a wider review of speed limits throughout the Corridor.

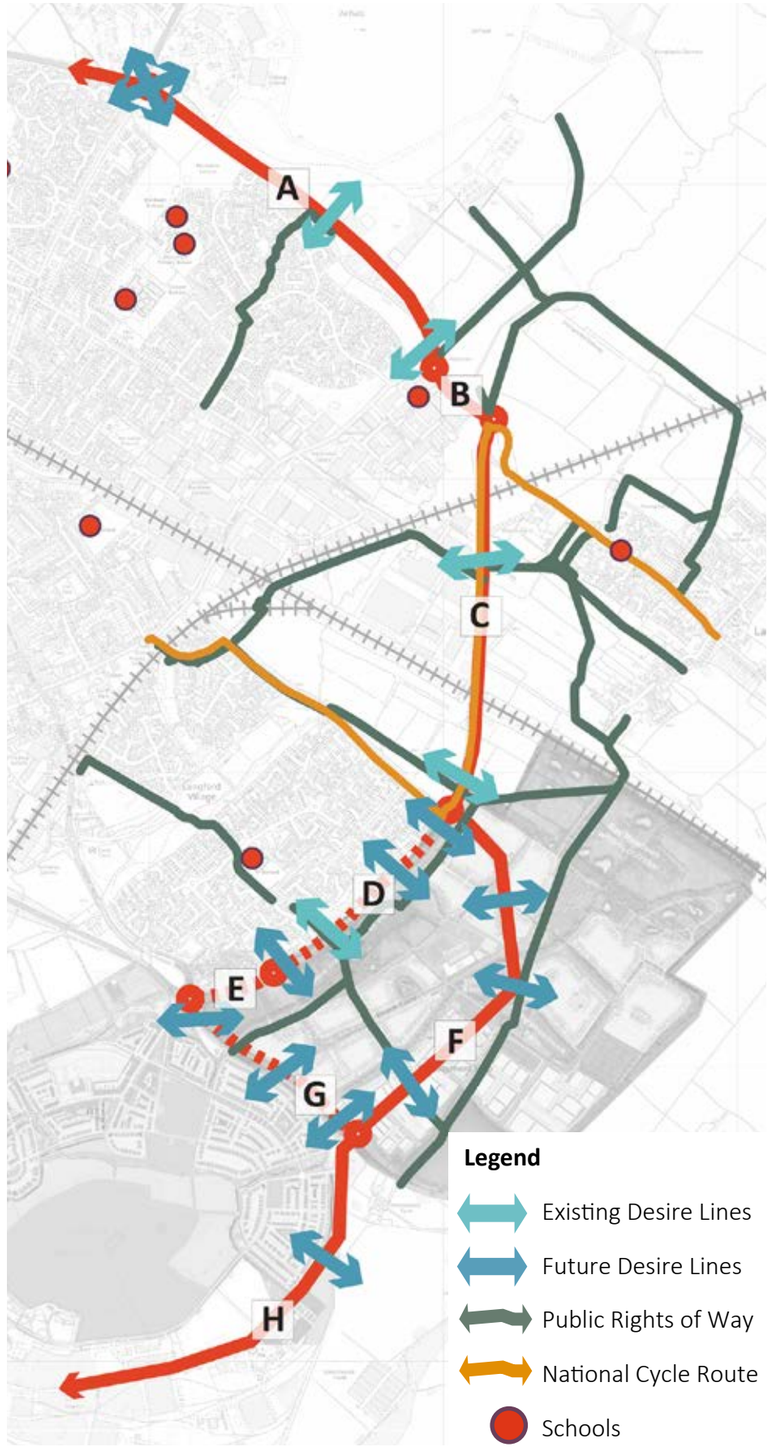
Currently the entire study area is covered by a 50mph speed limit which significantly hinders people's desire to travel actively along it. Speeds of this nature also make it difficult and intimidating for people to cross the road.

These issues were acknowledged during stakeholder engagement, and slower speeds were suggested for the Links. Revising speed limits downwards will also have the potential to reduce air quality issues provided a free flow of traffic can be generated.

Where the route passes through the strategic housing sites, speeds should be significantly reduced, for example to 30mph, to improve safety at crossing points, and enhance connectivity to and from the town centre. Link D, through which several formal crossing points were proposed, will require very careful treatment.

Speed limits will be enforced through alterations to the carriageway, which are illustrated in the sections on the following pages.





OVERALL DESIGN APPROACH

The overall design approach to the Eastern Corridor, which reflects suggestions raised at the Stakeholder workshop, is shown to the right.

The following pages expand upon this with more detailed sections for each Link, illustrating how the walking and cycling network can be developed and be balanced against vehicular needs.

The following approaches to different elements of Link design should also be borne in mind.

GATEWAYS

Gateways need to clearly signal a visual and psychological change to the feel of the street. This can be achieved through changes in surface materials and/or through the introduction of vertical elements in the carriageway, as at Poynton. The approach here also includes an element of public art to further embellish gateway status:

Poynton (source: © 2018 Google). Central median and vertical structures support informal pedestrian crossing movements and encourage lower vehicle speeds.

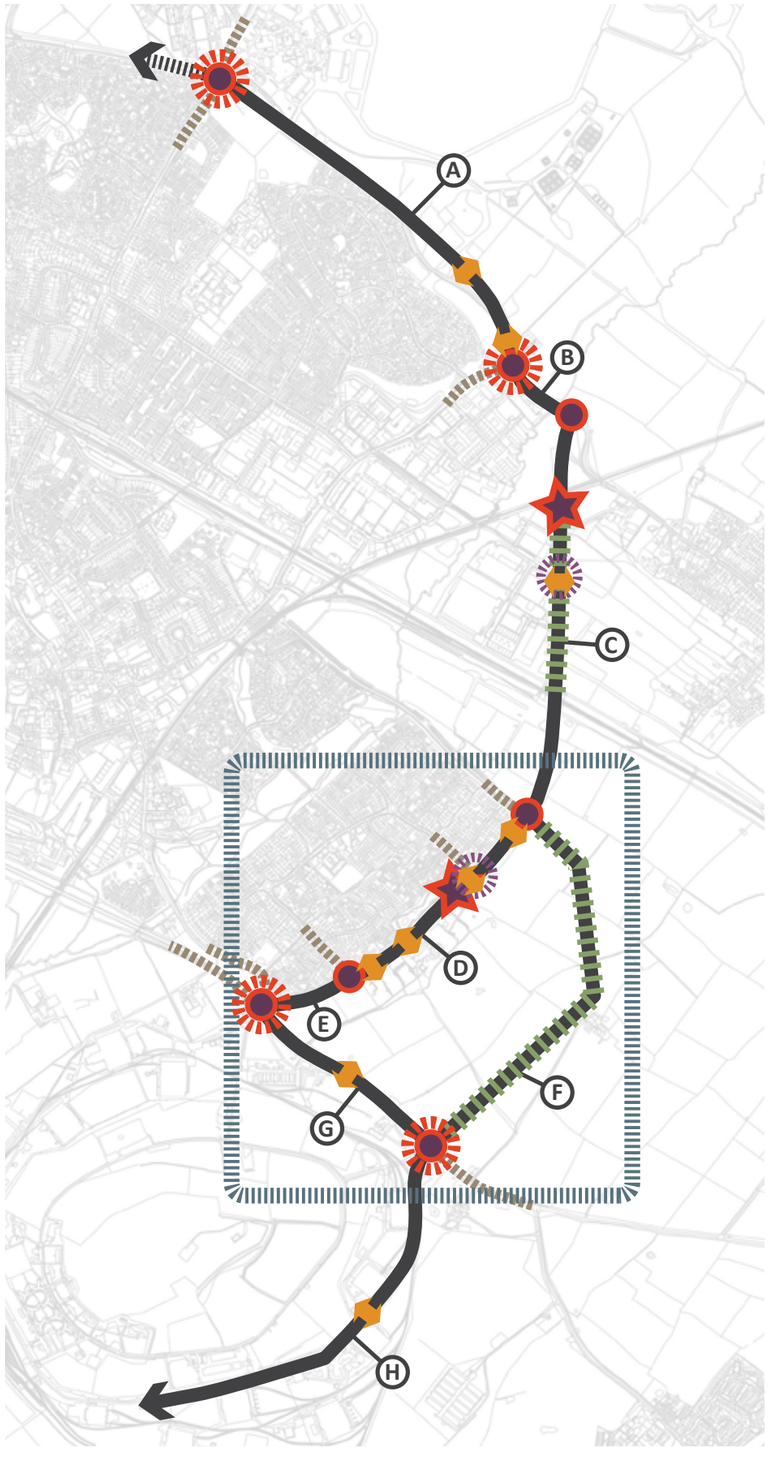
Currently there are few gateway spaces in Bicester. However, the Eastern Corridor project creates opportunities for new gateway spaces to be introduced that would enhance the image and identity of the town. Such spaces should be found at the key arrival points and important nodes.

DESIGN APPROACH:

- Multi-functional movement spaces that cater for all modes
- Typically will contain visual attractions such as public art, lighting, or planting
- Incorporate green infrastructure to enhance the overall image and quality of the space
- Consider existing and future pedestrian circulation and desire lines

Legend

- Links- develop detailed design in accordance with relevant section
- Develop walking and cycling network along Link
- Gateways
- Public art
- Reduce radii on approaches to roundabout to reduce vehicle speeds, include informal crossing points on all arms
- Reduce junction radii and continue walk/cycle links across junction mouth
- Speed management through highway design
- Formal crossings
- Landscape enhancement
- Reduce carriageway width of side roads and approaches to support Link interventions and control vehicle speeds



PUBLIC ART

Gateway interventions can also include public art. Additional locations for interventions are suggested in Links C and D. These could take the form of an embedded aesthetic that subtly controls vehicle speeds, or more obvious interventions such as those used at Poynton.

Public art is often thought of as a statue or a stand-alone sculpture in a public place – usually with a specific connection to a site. Current approaches seek for art to be embedded in a space, not always in an obvious way.

For the embedded approach to work, artists need to be involved from the outset of a project. They should be part of the design team and be actively involved with community engagement.

SUSTAINABILITY

The design of streets and spaces has an important role to play in reducing carbon dioxide emissions.

According to Living Streets (Making the Case for Investment in the Walking Environment):

> *The environmental benefits of walking friendly environments are largely related to modal shift from other modes. Reductions in carbon emissions and noise, and improvements in air quality are potential impacts.*

To design sustainably:

- Consider which materials and street furniture will be used, their source, sustainability, whole life costs and ease of maintenance
- Use renewable energy to power street lights and other street furniture wherever possible
- Use green infrastructure to support the Garden Town ethos, improve air quality, remove carbon dioxide from the atmosphere, support urban food production and help support biodiversity
- Design to support sustainable forms of transport such as catching the bus, walking or cycling which help reduce reliance on car use
- Consider the impact of the micro climate and solar gain on the design of the street/space and the position of street furniture
- Consider the implications of flood risk and drainage, incorporating the principles of sustainable drainage

GENERAL LINK DESIGN

The following should be borne in mind when considering detailed designs for each Link. Whilst the Corridor is well established, new design interventions need to consider competing movement priorities and should:

- Be design-led, not engineering-led, to produce a scheme that is clear, can be easily communicated to stakeholders, and which addresses issues and concerns of all future users
- Include segregated pedestrian and cycle infrastructure
- Establish the strategic fit with existing walking/cycling routes and provision, including options to improve the quality of the National Cycle Route in Link C
- Identify specific problems/obstacles and propose design/engineering options to resolve them
- Support the speed limit strategy for the Corridor
- Include footways wide enough to provide segregated footway and cycle ways, ideally with a 2m minimum width for pedestrians and 2m minimum for cyclists. If available space does not allow users to be separated, a minimum width 3.5m shared use route should be provided and obstacles removed.
- A buffer strip of at least 1m between the carriageway and footway/ cycleway
- Inclusion of a median strip of at least 2m to facilitate pedestrian and cycle crossing points, could also accommodate lighting and/or low level planting
- Improved crossing facilities for pedestrians and cyclists at junctions/ roundabouts wherever practicable
- Continue pavements and cycle routes across junctions to reinforce active travel priority
- Remove unnecessary clutter, and ensure street furniture is consistent

- Simplified traffic signing and lining, using the minimum number of signs, lights and lines required
- Reduction of vehicular traffic dominance of junctions, simplifying the arrangement for drivers and tightening turning radii where possible
- Provision of consistent lighting
- Provision of high quality street furniture and artistic features at gateway locations
- Ensure entrances to side streets are adjusted to reflect the enhancements to the Corridor, to reinforce lower vehicle speeds and aid pedestrian and cycle priority

STREET FURNITURE

- High quality, visually attractive and cohesive street furniture is required to reinforce the role of the Corridor, and provide places to sit and rest. Furniture could include bespoke lighting and other elements
- Ensure furniture is sited to minimise clutter with seating positioned with consideration to micro climate, and to be conducive to social interaction
- Cycle parking should be positioned to encourage sustainable travel to gateway spaces and key destinations, and also facilitate multi-modal travel, such as cycling to catch a bus or train

GREEN INFRASTRUCTURE

- New planting and overall management of the green infrastructure within verges and central reservations where this would not adversely affect sight-lines or highway safety
- Ensure drainage utilises the latest technologies to manage run-off at or near source
- Introduce new street trees at 10m spacings in local centres to create a more formal boulevard effect in these areas
- New soft landscape should be introduced for amenity, shelter and shade
- Carefully manage soft landscape to enable views to adjacent areas and key destinations, to aid legibility

MATERIALS

- High quality materials such as natural stone, conservation paving or resin bound gravel will be appropriate in some locations, particularly gateway locations and within the setting of RAF Bicester Conservation Area
- Street furniture should be constructed of timber, composite materials, steel or natural stone and be used consistently throughout the Corridor

AIR AND NOISE POLLUTION

Issues of air and noise pollution on the Corridor can be mitigated by:

- Reducing speed limits sufficiently to encourage slower but regular journey times on the peripheral route
- Incorporating additional street trees where possible
- Encourage a shift away from private car use by promoting car sharing
- Promote a switch to electric vehicles and ensure charging facilities are provided within neighbourhoods and the new local centres
- Ensure walking and cycling are appropriately facilitated along the Corridor to encourage active travel

SUSTAINABLE DRAINAGE SYSTEMS

In order to minimise the impact of new road schemes on the natural environment, Sustainable Drainage Systems (SuDS) need to be incorporated into the detailed designs.

SuDS are a combination of features that work together to manage flows and volumes of water, and help mitigate local flooding issues as well as provide visually attractive environments that can support biodiversity.

The plan below shows how various SuDS components can be incorporated into a typical highway cross section.

SWALE

Swales are flat-bottomed ditch-like components that can convey water alongside the Corridor, and also provide water storage capacity if there is flow control at the outfall.

Swales can be fed by water flowing laterally into them through over-the-edge drainage. Design needs to ensure that water can flow from hard surfaces freely into the adjacent grassed area, with the grassed area falling away from the path or road.

FILTER STRIP

Filter strips are grassed areas designed to accommodate a “sheet flow” of water that discharges into the next SuDS component. They perform a useful function, removing sediments from run-off and filtering heavy metals and other pollutancts. They can also enable water to infiltrate into the ground.

FILTER DRAIN

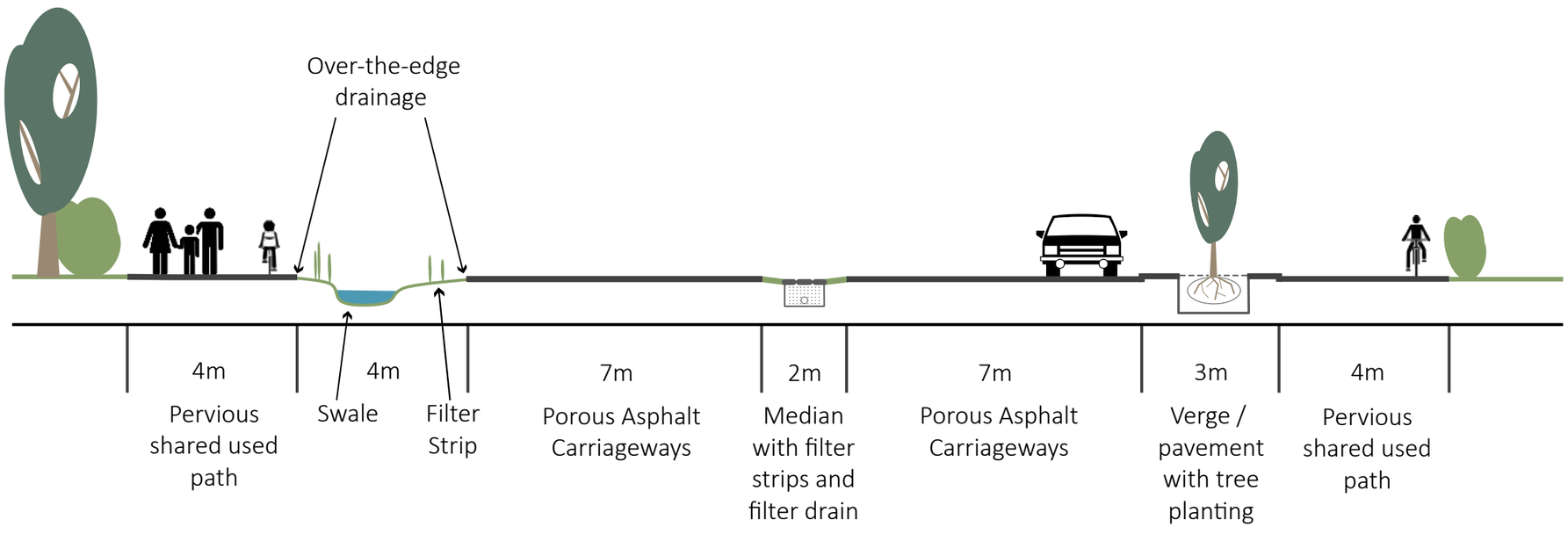
These are linear trench drains filled with clean aggregate that can store and transport water. They are normally lined and usually contain a perforated pipe to assist drainage. Aggregate size should be chosen to allow maximum water storage within the gaps.

TREES

In urban areas tree rooting areas can form part of SuDS. They can improve infiltration systems. Detailed design of the tree pit is dependent upon the use of structural soils, modular structures or raft systems, and will need to be considered on a site by site basis.

PERVIOUS PAVING

Hard surfaces should be constructed of block permeable paving, porous asphalt, porous concrete, or resin-bound gravel throughout the Corridor.



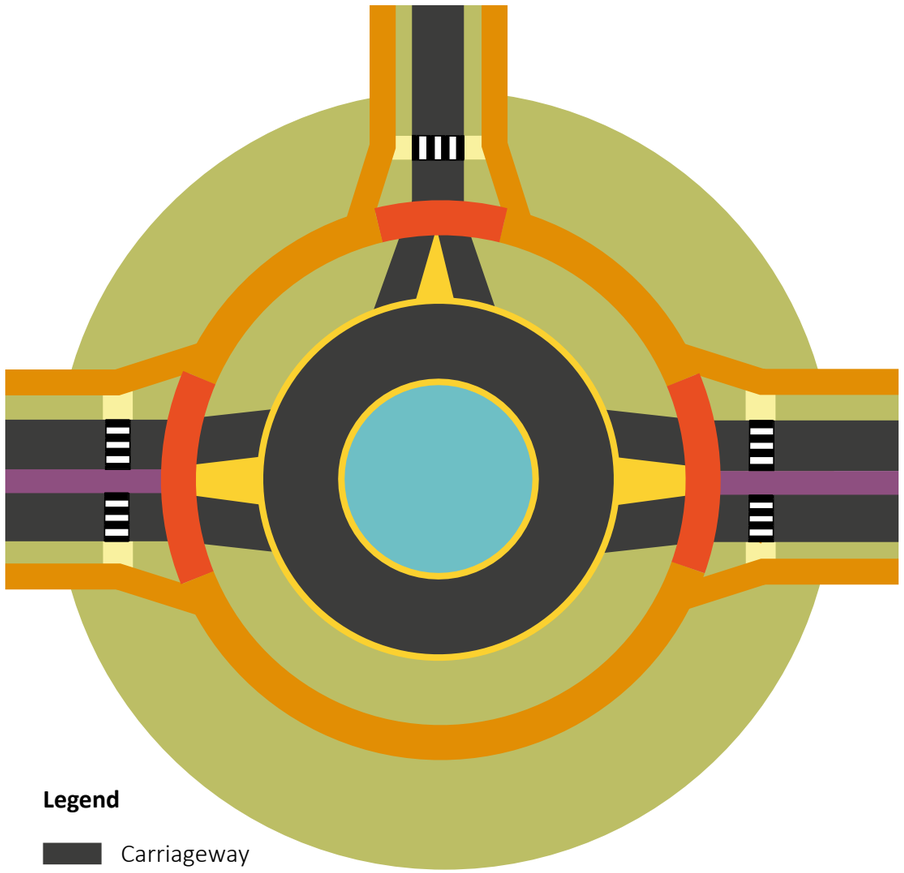
PEDESTRIAN AND CYCLE PRIORITY

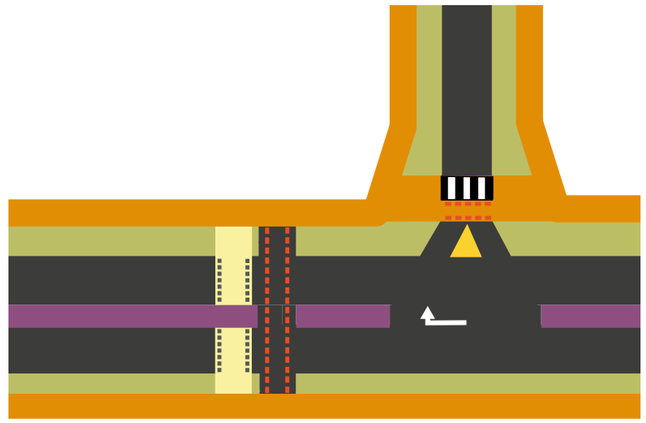
In order to ensure the Corridor is attractive and safe to walk and cycle along, and to cross, the layout shown here indicates how roundabouts and side road junctions could be designed.

The roundabout is designed according to the Dutch model, providing cycle priority across all arms and zebra crossing facilities for pedestrians.

Formal crossing points on the main carriageway are designed as parallel crossings. These comprise:

- Signalised, two-stage, straight crossing facilities for pedestrians
- Elephant's feet for cyclists that enable these faster users to cross all four lanes during a single crossing phase.





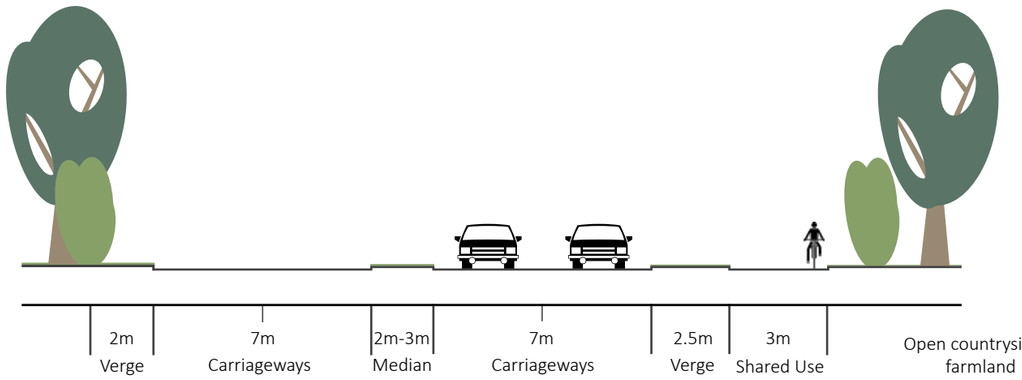
SECTIONS

These sections illustrate how the *Overall Design Approach* could be delivered. To help reinforce lower speed limits, variation in the carriageway surface treatment will be needed, for example use of coloured asphalt. Lighting can be provided in the verges or central median strips.

LINK A

To ensure the Corridor is the favoured route for through-traffic, current approaches seek to upgrade this Link to a dual-carriageway.

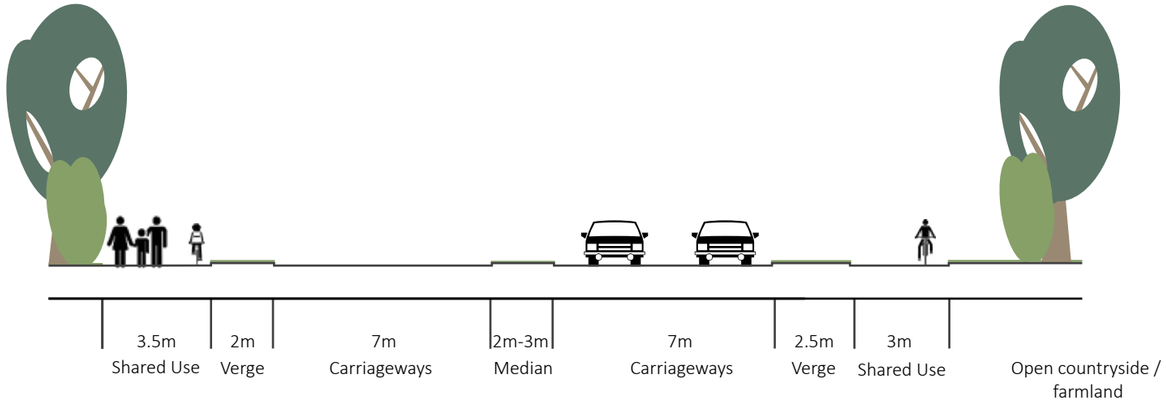
This could be accommodated as shown. There is an existing shared use route to the south that would continue to be the main pedestrian / cycle route on this side. A new shared use facility could be provided on the northern side to facilitate active travel linkages to RAF Bicester, and also to the rest of the Corridor.



LINK B

Link B already provides shared use facilities on the southern side, and a footpath on the northern side.

The dualling of this section will require additional land and a completely new re-alignment of this Link is proposed in *The Bicester Movement Study*, 2013. This proposal also includes the potential to deliver a new road bridge to cross the railway in Link C.

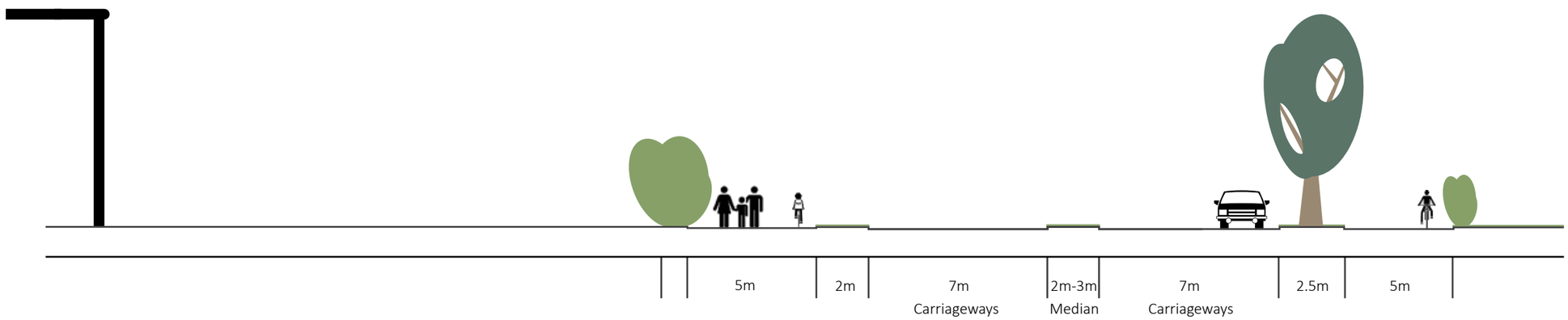


LINK C

Link C forms part of the National Cycle Network and currently accommodates a shared use route on the western side.

The carriageway is especially wide in order to facilitate a right-turn lane serving the employment area. This junction has exceptionally wide radii that deflect walkers and cyclists from their desire line.

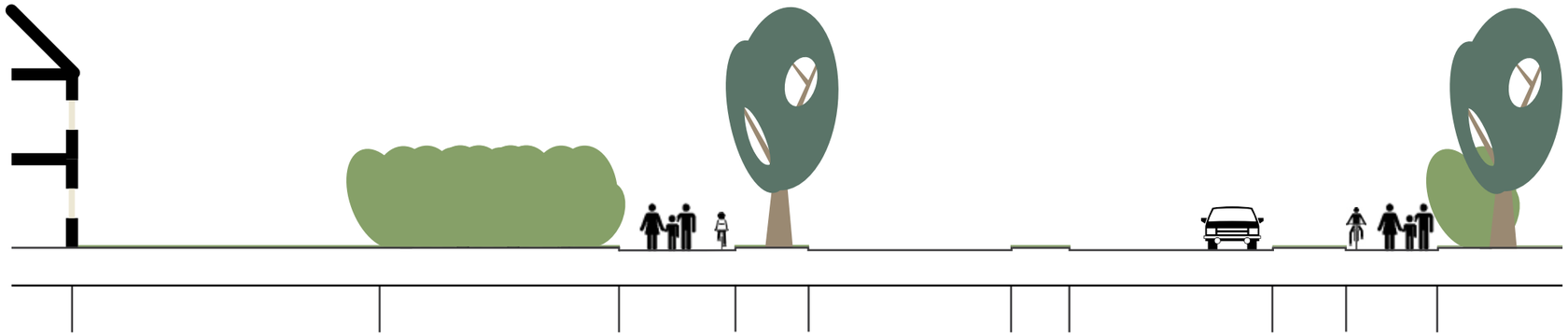
The link is intersected by a level crossing which creates an additional barrier and potential safety issue for all modes, however, the delivery of the new road bridge discussed above, to mitigate increased future closing of the crossing resulting from additional rail services, will allow for improved and direct facilities for all modes to be created.



LINK D

This link represents the transition between the existing town and the new strategic development at Wretchwick Green. Its design requires very careful consideration to ensure pedestrians and cyclists can cross easily.

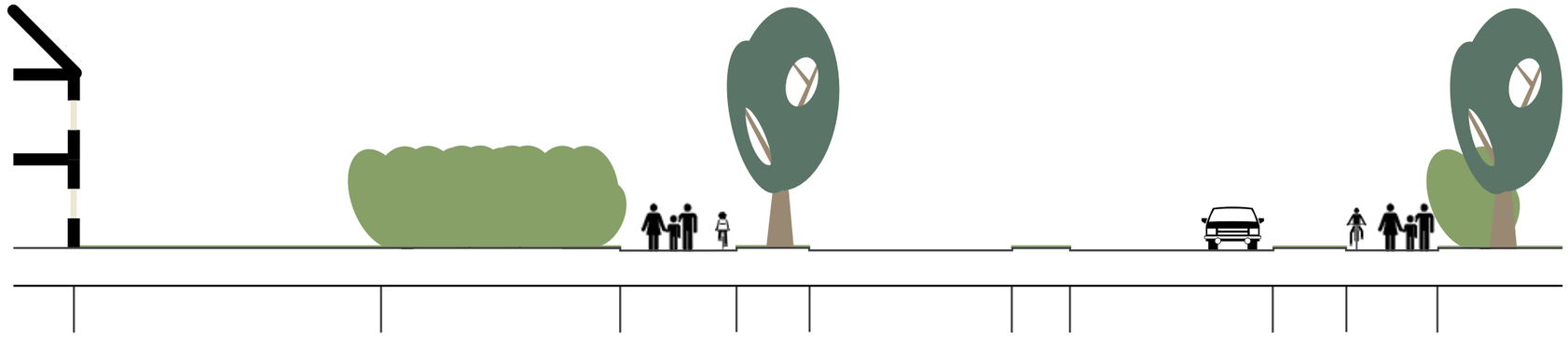
In order to remain connectivity with Links A-C, this Link has been converted to dual carriageway and would have a 40mph speed limit. This will require signalised crossings to be installed on desire lines to enable safe crossing by pedestrians and cyclists.



LINK E

Link E is currently the only stretch that is constructed as dual-carriageway. A footpath is provided on the northern side. Like Link D, this link provides a transitional space between existing and future development.

To create seamless walking and cycling provision along the Corridor, the provision of a shared use route on the southern side would require some additional land take, and this needs to be considered as part of the Wretchwick Green development.



LINKS F AND H

These are new routes running through the strategic sites, and they should seamlessly connect together. The main carriageway should be lined with trees to help slow traffic speeds and soften the appearance of the Links. The route here passes through three different Character Areas (CA) as follows:

CA 1: LOCAL CENTRES

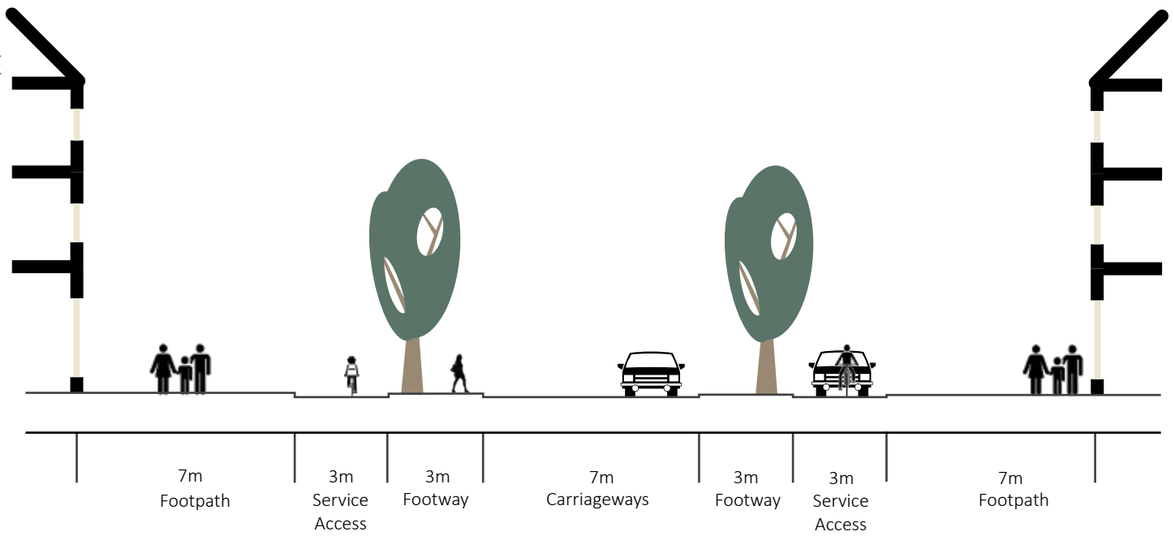
Within local centres, on either side of the main carriageway a 20mph service access should be provided that should also act as the cycle route through the Link. These access streets must be designed with pedestrian and cycle priority, where vehicles enter as guests and cyclists can assume the primary position in the carriageway.

Wide footpaths need to be included to enable uses to spill out into the street, generate activity and contribute to a feeling of openness.

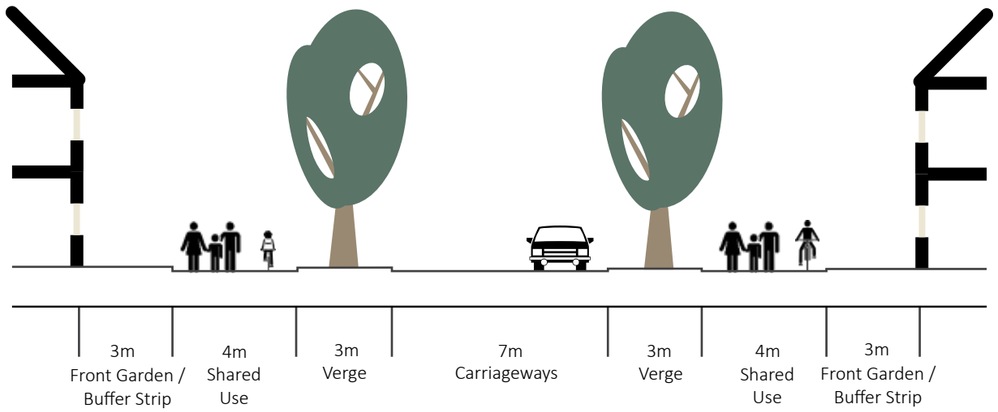
CA 2: RESIDENTIAL AREAS

A narrow carriageway is needed that will temper vehicle speeds, further supported by vertical structures such as street trees. Wide shared use facilities are separated from the carriageway by a generous verge, and houses face the street with a buffer strip / defensible space.

CA 1:
LOCAL CENTRE



CA 2:
RESIDENTIAL AREA



CA 3: GREEN SPACES

Routes through green spaces need to be designed to maintain the openness of those areas, and enable new active travel routes to connect to the Link on desire lines.

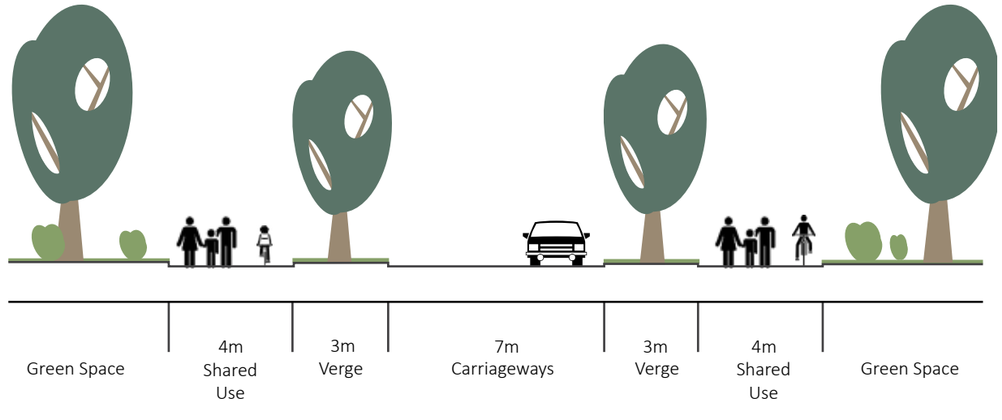
Again, wide shared use facilities should be provided that are separated from the carriageway by a generous verge to encourage walking and cycling.

IN GENERAL

Signalised crossing points may be needed within the local centres and where pedestrian desire lines cross the Link.

CA 3:

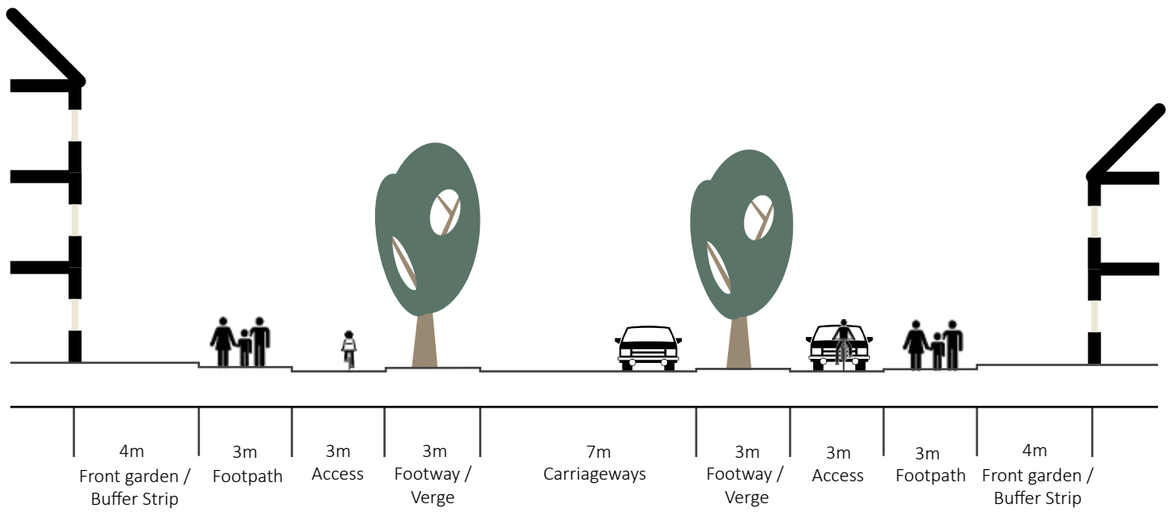
GREEN SPACES



LINK G

Link G provides another transitional space between the two strategic sites and in the future will have much in common with Links D and E as an important route for all modes.

On either side of the main carriageway a 20mph access road should be provided that should also act as the cycle route through the Link. These access streets must be designed with pedestrian and cycle priority, where vehicles enter as guests and cyclists can assume the primary position in the carriageway.



4 | Delivery Strategy

DELIVERY TEAM

Successful delivery of the Strategy will rely on a collaborative and multi-disciplinary approach that will need to be managed by a single sponsor organisation that will manage the programme, oversee distribution of the various funds involved and be the employer of the contractor(s). The delivery team should comprise those from the following specialisms:

- Highway / traffic engineering and design
- Urban design
- Town planning
- Landscape architecture
- Historic conservation (where the Corridor passes through the Conservation Area and within the setting of other heritage assets)
- Ecology
- Public art professionals
- Accessibility / mobility specialists
- Lighting engineering
- Maintenance management

The responsibilities of the County and District Councils are given in the adjacent table.

TIMESCALES

	SHORT TERM: 0 TO 2 YEARS	MEDIUM TERM: 2 TO 5 YEARS	LONG TERM: 5 YEARS +
COUNTY COUNCIL AS HIGHWAY AUTHORITY	• Commence detailed design for the Corridor with LPA to address issues raised in this Strategy and ensure compliance • Develop a detailed strategy to implement the speed limit strategy once agreed. This will need to include identification of the physical interventions that are required and the approach to be taken to phasing	• Commence delivery of the changes to speed limits across the town	• Commence delivery of improvements to highway capacity
DISTRICT COUNCIL	• In conjunction with the Highway Authority continue development of detailed design work for the Corridor, to ensure Link design follows the principles and approaches set out in this Strategy • Ensure all opportunities are taken from development to affect changes to existing streets to ensure they support the aims of this Strategy • Review emerging wayfinding strategy (by others) and ensure it is aligned with this Strategy	• In conjunction with the Highway Authority Bicester Town Council commence delivery of sustainable connectivity improvements. • Continue delivery of Graven Hill	• Deliver South East Bicester • Continue delivery of Graven Hill

INTERDEPENDENCIES

There are several major existing projects and initiatives that will be influenced by, and influence the delivery of, this Strategy.

The table to the right sets out these key interdependencies and their potential effect on, and relationship with, the Eastern Corridor Design Strategy.

ISSUES	INTERDEPENDENCIES / EFFECT
WRETCHWICK GREEN	This development aims to deliver approximately 1500 new homes, and will include a new local centre with various community facilities. Like the development to the north west, it is important that this scheme links well to the rest of the town with high quality walking and cycling connections and reductions in the severance caused by the existing Corridor.
GRAVEN HILL	Graven Hill is earmarked to deliver approximately 1900 homes and a new local centre. Like the other regeneration areas, the way this site links back to the existing town requires considerable thought, to ensure it develops into an integrated neighbourhood.

GOVERNANCE

Capital investment needs to be sought and allocated to deliver the Corridor redesign, supported by ongoing highway revenue funding, contributions from new development, and, with community support, funding from external sources.

Other policies and strategies that affect movement in the town also need to be aligned. This table indicates the potential role different organisations have in influencing policy approaches and delivery of the Strategy.

ORGANISATION (OR PART)	POTENTIAL ROLE IN THE DELIVERY OF THE BICESTER GARDEN TOWN MASTERPLAN
LOCAL PLANNING AUTHORITY	• Through policy development a requirement to support the delivery of the Strategy • Through policy development a requirement that investment in the public realm, in particular within the new local centres are delivered as part of new development • Consistently clean and well maintained streets and street furniture
HIGHWAY AUTHORITY	• Ensure capital investment priorities within Bicester align with the Strategy and support delivery its objectives • Delivery of revised speed limits throughout the Corridor • Incremental improvements (e.g. decluttering) as a result of ongoing management and maintenance • Maintenance priorities and agreed methods of working that are aligned with the Masterplan e.g. not replacing centre lines in appropriated locations
PUBLIC HEALTH (HNT PARTNERSHIP AND NHSE)	• Support for the Strategy in terms of its role delivering healthier outcomes for Bicester residents through increased physical activity accessing, moving through (on foot and by bike) the town and its neighbourhoods • Development and delivery of a behaviour change programme to encourage walking and cycling
DEVELOPERS	• Recognition and support of the Strategy and delivery of developments that respond positively to it
THE COMMUNITY	• Support delivery of the Strategy and bids to external funding sources

Appendices

APPENDIX A: STAKEHOLDER ENGAGEMENT

To support the delivery of improvements to the Eastern Peripheral Route, three stakeholder engagement events have been undertaken:

1. Officer Workshop 1, held on 1 February 2018 at Whitelands Farm Sports Pavilion
2. Officer Workshop 2, held on 15 February 2018 at the Littlebury Hotel

The outcomes of these events are provided on the following pages.

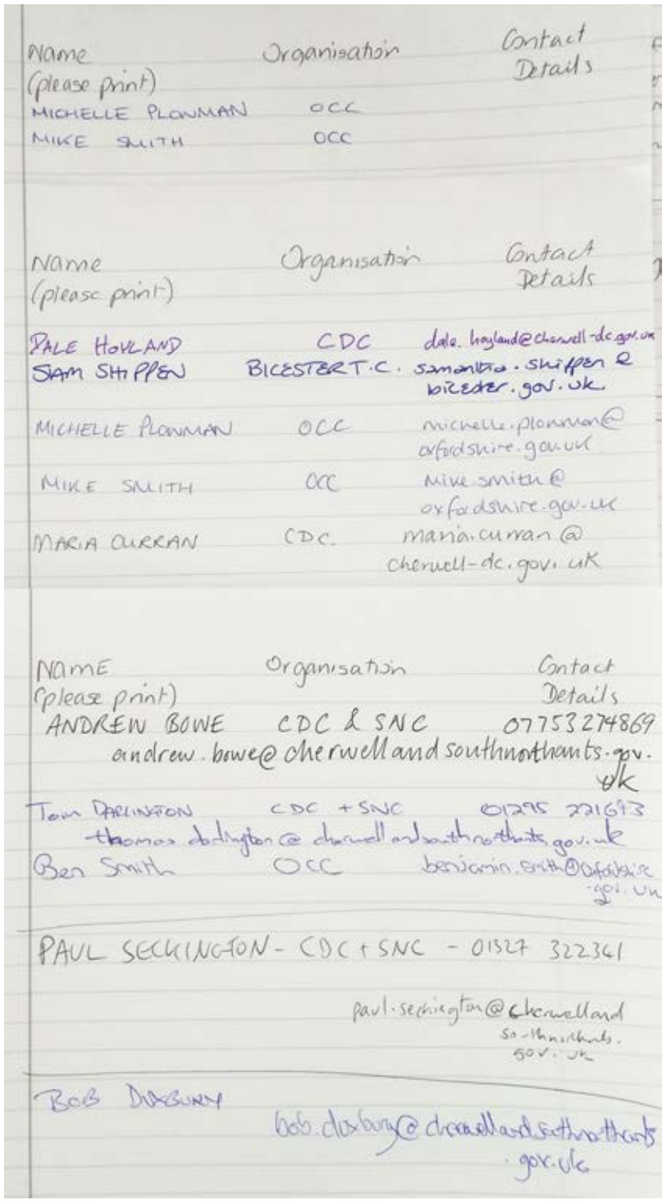
OFFICER WORKSHOP 1: 1 FEBRUARY 2018

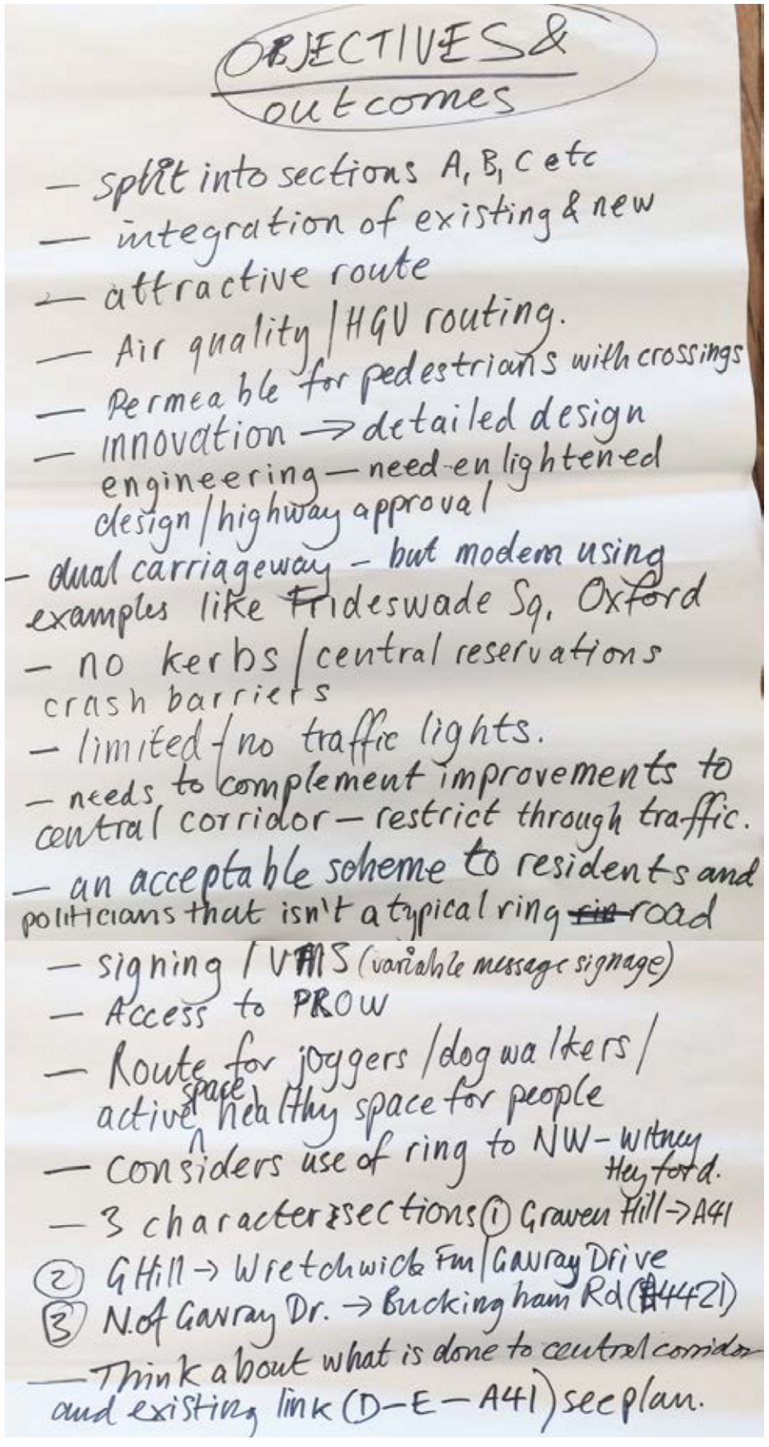
The purpose of this workshop was to:

- Summarise where we are in the masterplanning process and the role the Eastern Corridor can play in delivering the wider outcomes and objectives for Bicester
- Introduce precedents and good practice for busy roads through urban areas from elsewhere in the UK and abroad
- Explore the specific outcomes and objectives for the route
- Begin development of a design strategy for the corridor which addresses both 'movement' and 'place' functions – collaborative process
- Identify potential delivery issues
- Identify information needed for Officer Workshop 2

Attendees undertook three tasks:

1. Identify Objectives and Outcomes for the route
2. Identify Constraints and Challenges affecting the route
3. Clarify the information needed for the second workshop





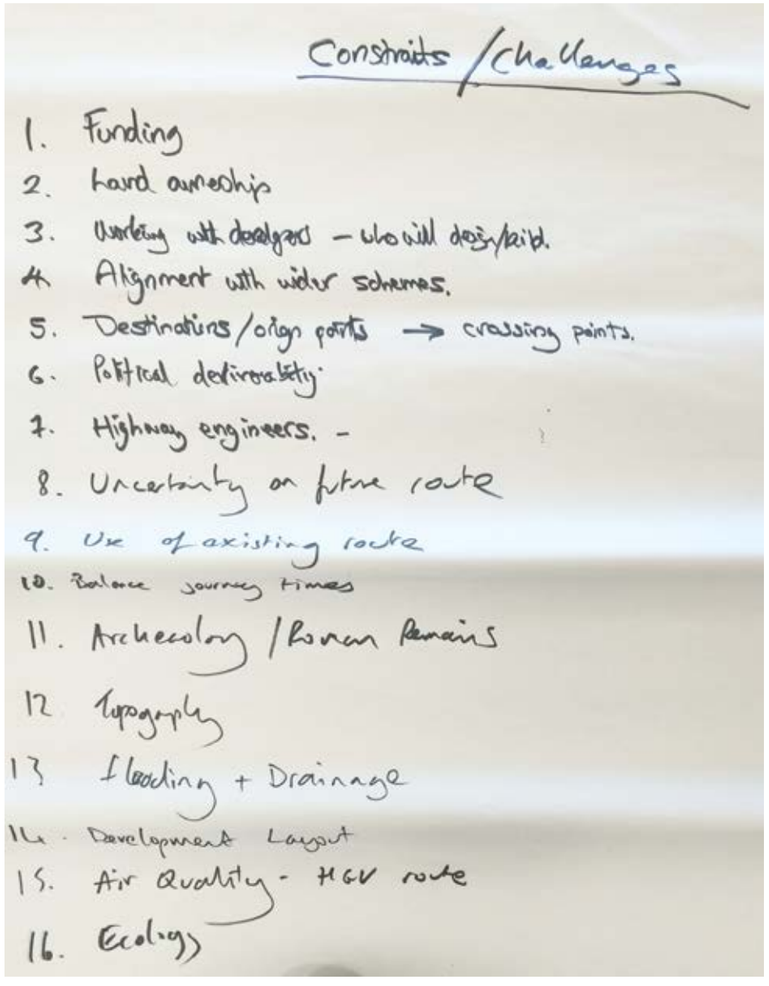
TASK 1: OBJECTIVES AND OUTCOMES

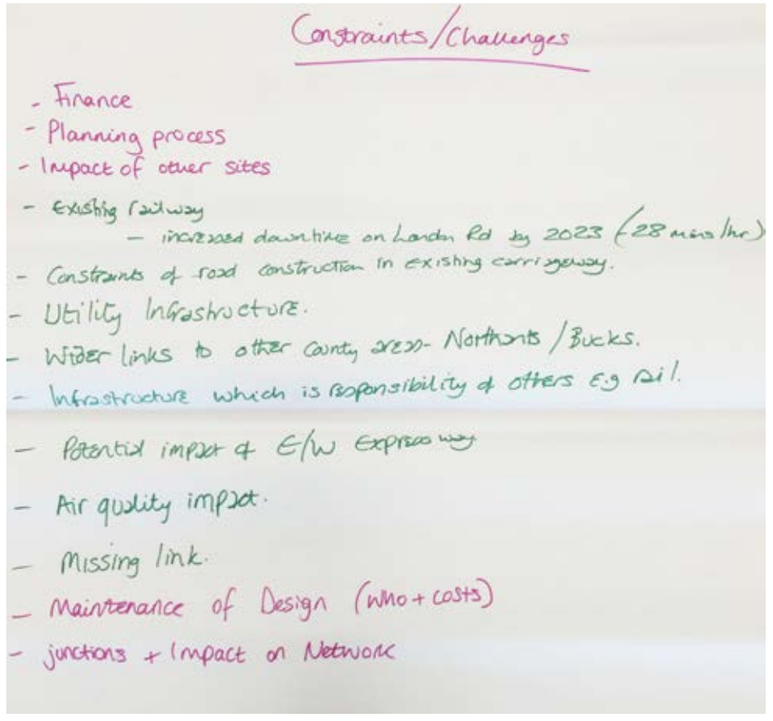
GROUP 1

- Split into sections e.g. A, B, C
- Integration of existing and new needs to be well considered
- Attractive route
- Air quality and HGV routing
- Permeable for pedestrians with crossings
- Innovation – detailed design engineering – need enlightened design/ highway approval
- Dual carriageway – but modern using examples like Frideswade Square in Oxford
- No kerbs/central reservation/crash barriers
- Needs to complement improvements to central corridor – restrict through traffic
- An acceptable scheme to residents and politicians that isn't a typical ring road
- Signing/VMS (variable message signage)
- Access to PROW
- Route for joggers/dog walkers/active spaces/healthy spaces for people
- Considers use of ring road to NW.
- 3 character sections: 1: Graven Hill- A41, 2: Graven Hill- Wretwick Farm / Gavray Drive, 3: North of Gavray Drive- Buckingham Road (A4421)
- Think about what is done to central corridor and existing link (D-E-A41)

GROUP 2

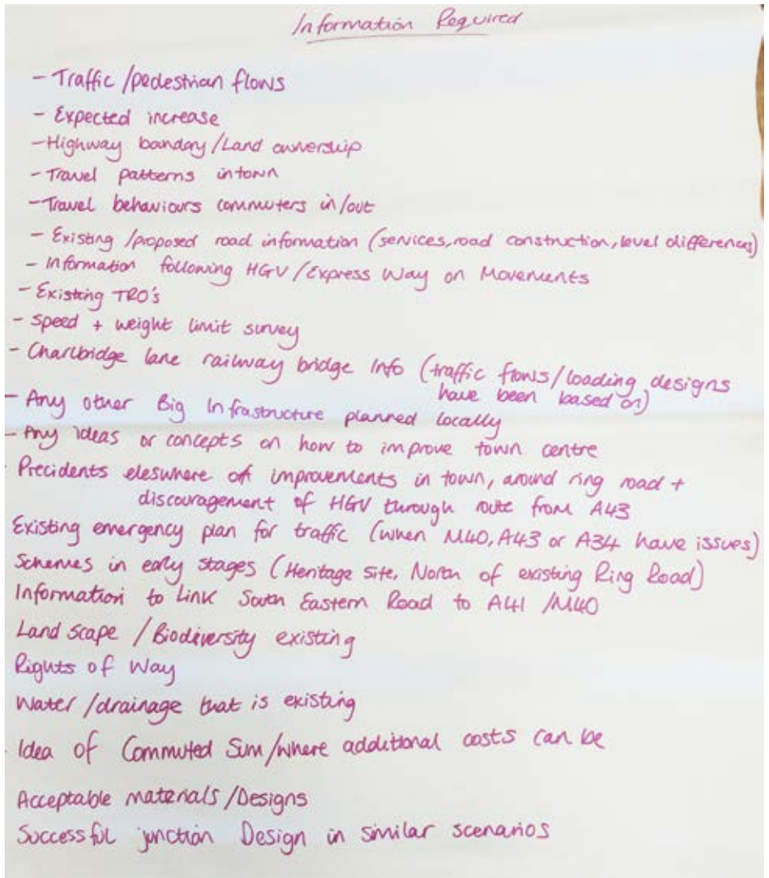
- Discourage strategic through traffic on particular routes.
- Safe routes that feel safe to walk and cycle on – especially ones leading to the town centre and beyond.
- Wider permeability to older developments.
- Corridor needs to be more attractive to through traffic than going the town centre.
- New communities need to be connected to the wider town and each other.
- Green corridor with structured landscape treatment and character.
- Crossings located on desire lines so people can take preferable routes.
- Need to be able to walk and cycle to key assets e.g. Bicester Heritage
- Walking and cycling along routes.

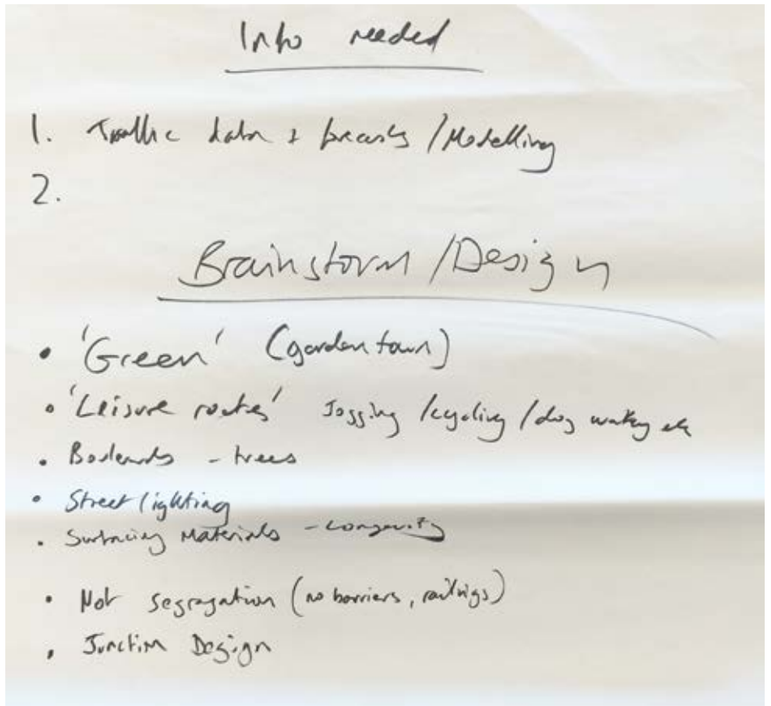




TASK 2: CONSTRAINTS AND CHALLENGES:

- Funding / Finance
- Planning process
- Existing railway
- Increased downtime on London Road by 2023 (28 mins/hr)
- Constraints of road construction on existing carriageway
- Utility infrastructure
- Potential impact of E/W express way
- Missing link
- Maintenance and associated costs
- Junctions and impact on network
- Land ownership
- Working with developers
- Alignment with wider schemes
- Destinations/origin points and crossing points
- Political deliverability
- Highway engineers
- Uncertainty on future route
- Use of existing route
- Balance journey times
- Archaeology and Roman remains and topography
- Flooding and drainage
- Development layout
- Air quality and HGV route
- Ecology





TASK 3: INFORMATION REQUIRED

- Traffic data and pedestrian flows
- Expected increases
- Highway boundary / land ownership
- Travel patterns in town
- Travel behaviour- commuters in / out
- Existing/proposed road information e.g. services, levels
- Information following HGV / Express Way on movements
- Existing TROs
- Speed and weight limit survey
- Charlbridge Lane railway bridge info (traffic flows / loading designs have been based on)
- Any other big infrastructure planned locally
- Any ideas or concepts on how to improve town centre
- Precedents elsewhere of improvements in town, around ring road and discouragement of HGV through route from A43
- Existing emergency plan for traffic when M40, A43 or A34 have issues
- Schemes in early stages (Heritage site north of existing ring road)
- Information to link south eastern road to A41/M40
- Landscape / biodiversity existing
- Rights of way
- Water / drainage that is existing
- Idea of commuted sum and where additional costs can be
- Acceptable materials / designs
- Successful junction design in similar scenarios

OFFICER WORKSHOP 2: 15 FEBRUARY 2018

This following collates the outcomes from the stakeholder workshop held at The Littlebury Hotel, Bicester on 15 February 2018.

In total, 15 delegates attended the workshop from a number of interest groups including:

- Cherwell District Council
- Oxfordshire County Council
- Bicester Town Council

The attendees were split into 4 groups and undertook 3 tasks to identify:

1. Review the ***Objectives and Outcomes*** discussed at Workshop 1 to ensure continued relevance and identify omissions
2. Begin development of a ***Design Strategy*** for the Distributor Road to identify broad themes
3. Undertake more detailed ***Design Development*** to explore more specific interventions

The completed worksheets for these exercises are included on the following pages.

SYSTRA

ATTENDANCE SHEET

Subject: Bicester South Eastern Distributor Road Workshop

Date and time: Thursday 15 February 2018, 9:30am – 12:30pm

Venue: The Littlebury Hotel, Kings End Bicester OX26 6DR

Nr.	Name	Organisation	Email
1	ANDY BOWE	CDC	andrew.bowe@cherwellandsouthnorthants.gov.uk
2	Sue Marchand	CDC	sue.marchand@cherwellandsouthnorthants.gov.uk
3	BEN SMITH	OCC	benjamin.smith@oxfordshire.gov.uk
4	C BENNER	OCC	charlie.benner@oxfordshire.gov.uk
5	Stephen Fitzgerald	OCC	Stephen.fitzgerald@oxfordshire.gov.uk
6	Nick Mottram	OCC	nick.mottram@oxfordshire.gov.uk
7	Dale Hoyland	CDC	dale.hoyland@cherwell-dc.gov.uk
8	BOB DUXBURY	CDC	bob.duxbury@cherwellandsouthnorthants.gov.uk
9	Linda Griffiths	CDC	linda.griffiths@cherwell-dc.gov.uk
10	JACQUI COX	OCC	jacqui.cox@oxfordshire.gov.UK
11	Michelle Plowman	OCC	michelle.plowman@oxfordshire.gov.uk

Nr.	Name	Organisation	Email
12	Mike Smith	OCC	mike.smith@oxfordshire.gov.uk
13	Samantha Shippen	Bicester Town Council	samantha.shippen@bicester.gov.uk
14	Sam Thomas	CDC	sam.thomas@cherwell-dc.gov.uk
15	PAT MULVIHILL	Oxf Co Co	patrick.mulvihill@oxfordshire.gov.uk
16			
17			
18			
19			

TASK 1: OBJECTIVES / OUTCOMES

Objectives/Outcomes

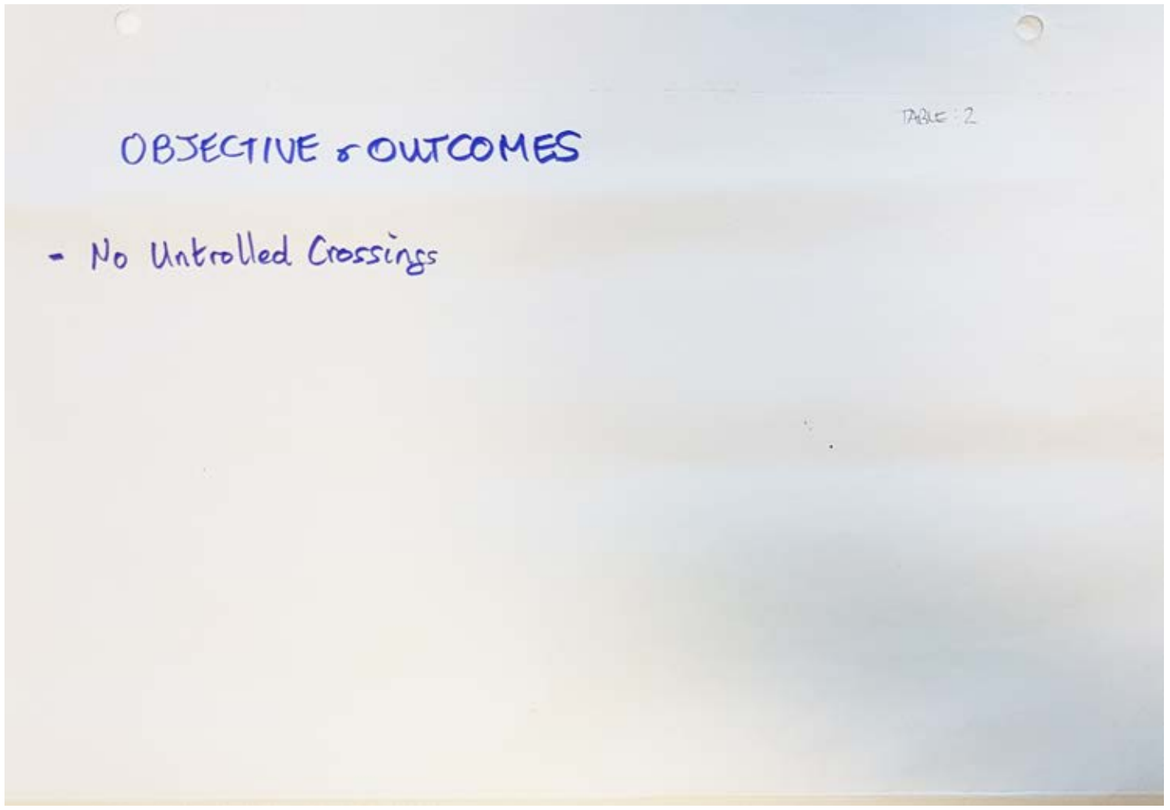
1. Safe and feels safe for all modes and ages day and night
2. The route needs to retain current capacity and accommodate future traffic movements / level of demand
3. The design needs to avoid diverting traffic / drivers onto existing residential streets or through the town centre
4. There needs to be a hierarchy of high quality connections for pedestrians and cyclists which connects the communities, schools, community facilities, key assets (eg Bicester Heritage) etc anf ollow desire lines.
5. An innovative design to lower speed along the route and change driver behaviour where needed
6. Provision of an attractive, legible, green (possibly a boulevard) which is tree lined
7. Provide opportunities for houses/development to address and overlook the route.
8. Ensure the Vision / Ambition for the route can be delivered within the land constraints and technical standards effectively.
9. Ensure the proposed scheme can be maintained
10. Provide connections to the Garden Spine and the wider town.
11. Can be walked and cycled along and crossed by all including the most vulnerable
12. Design a route that is flexible to accommodate and access public transport including bus stops along the route

SYSTRA

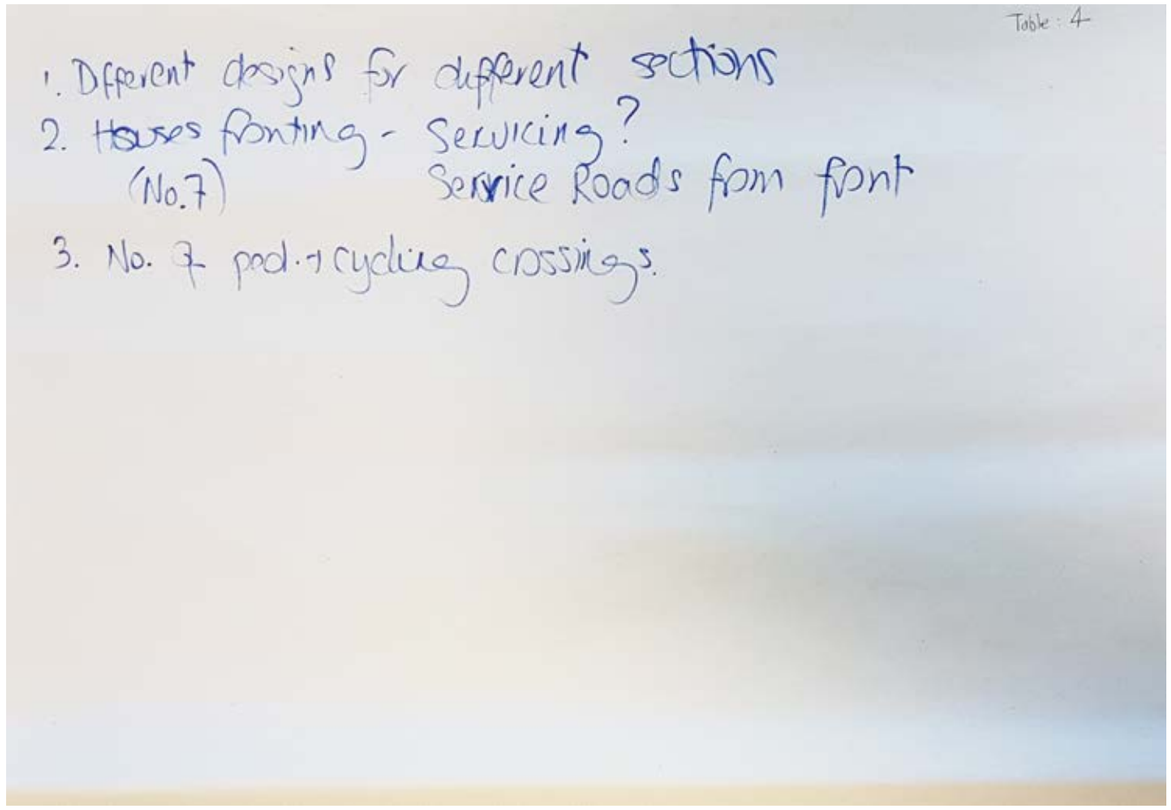
There was a general group-wide discussion around this list, which comprises Objectives / Outcomes identified in Workshop 1.

The group made the following comments:

- The idea to split the study area into different character areas, as discussed at Workshop 1, needs to be included
- Service roads are needed to enable front servicing
- Pedestrian and cycle crossings are needed in the right places on desire lines
- There is a need to maintain traffic flow and the route needs to be attractive to vehicles to maintain capacity and make it favourable over the town centre route- create overpasses for pedestrians?
- Crossing points are also needed for public transport
- Need to reinforce green connectivity and create more connectivity with the Garden Spine
- Who will maintain the road and associated street furniture and highways paraphernalia?
- How much will it cost to maintain?
- The list could be split into themes, e.g. “Green”, which could include the Garden Spine, biodiversity etc.
- With regard to affordability and deliverability the developer will pay for the road, which has cost implications



- No uncontrolled crossings



- Different designs for different street sections
- Houses fronting- servicing? Service roads from front.
- Number of pedestrian and cycling crossings?

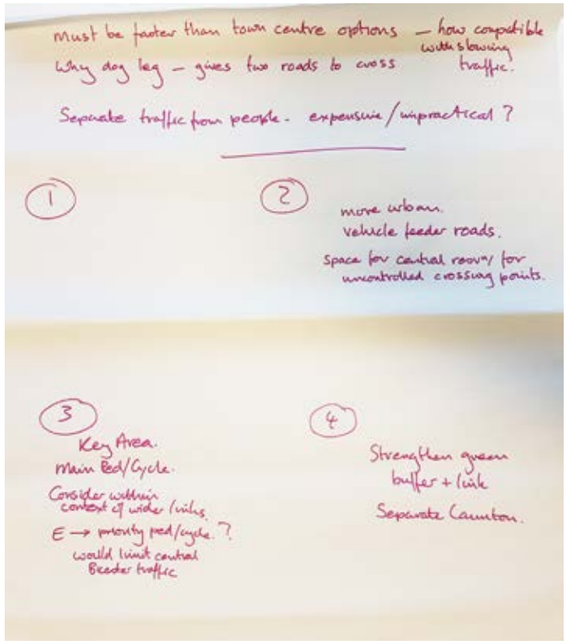
- Can overpass or underpass cross the railway?
- Need to ignore existing links from Langford to town centre
- Keep town centre 20-30mph
- Improve cycleway in Link C
- Off carriageway cycleway through Wretchwick Green
- New M40 south junction?
- Join A41?

TASK 2: DESIGN STRATEGY

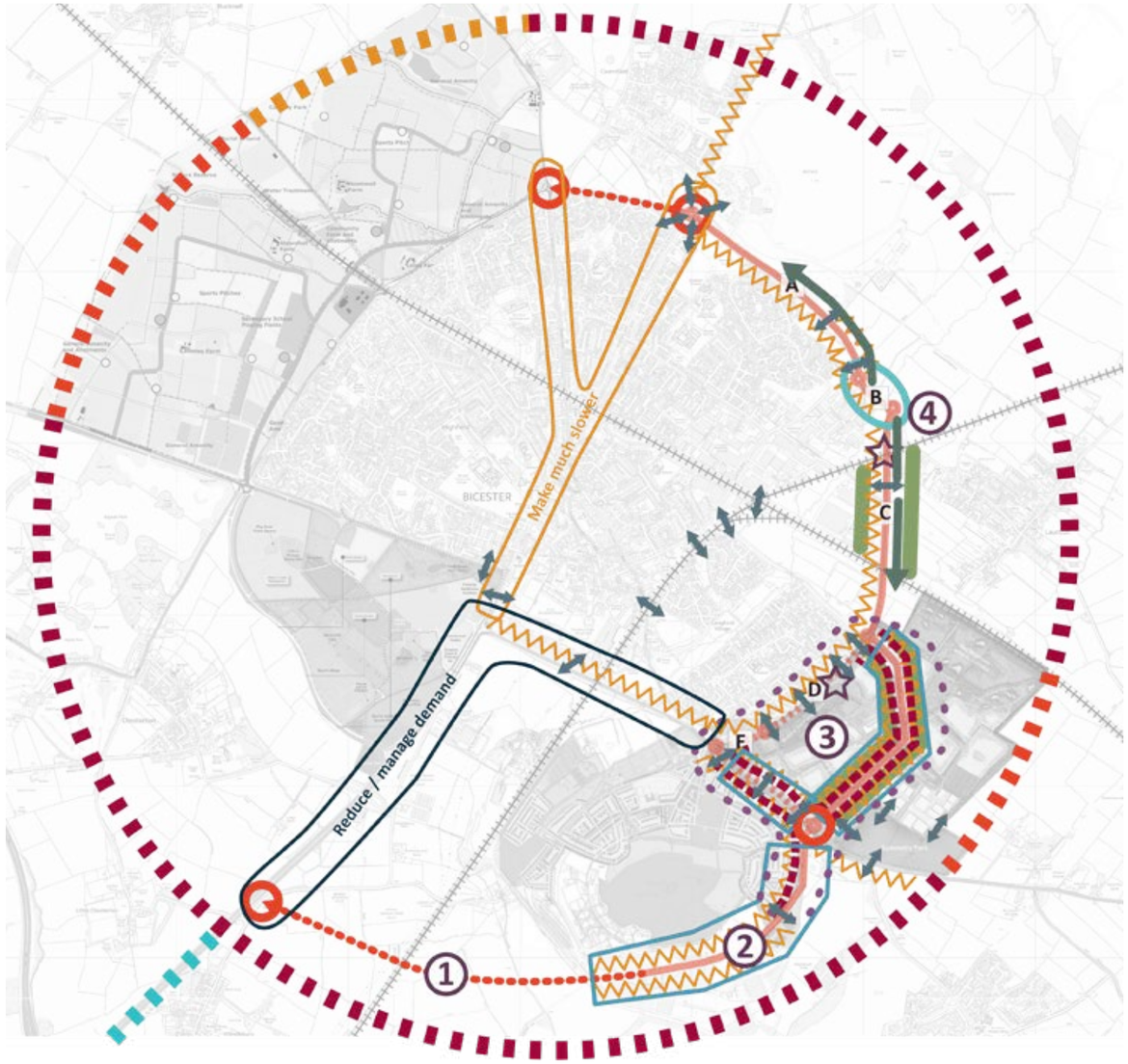
- Make the Banbury Road / Buckingham Road/ Queens Avenue / Kings End corridor much slower
- Reduce / manage demand on the A41 Oxford Road corridor

- Introduce bus stops on links A and C
- Need to accommodate bus stops in the Wretchwick Green development
- Highway speed needs to be aware of residential / pedestrians / cyclists etc.
- Frontage development possible with side roads for access in Wretchwick Green

COMPOSITE PLAN



The plan below draws together the findings of the four groups.

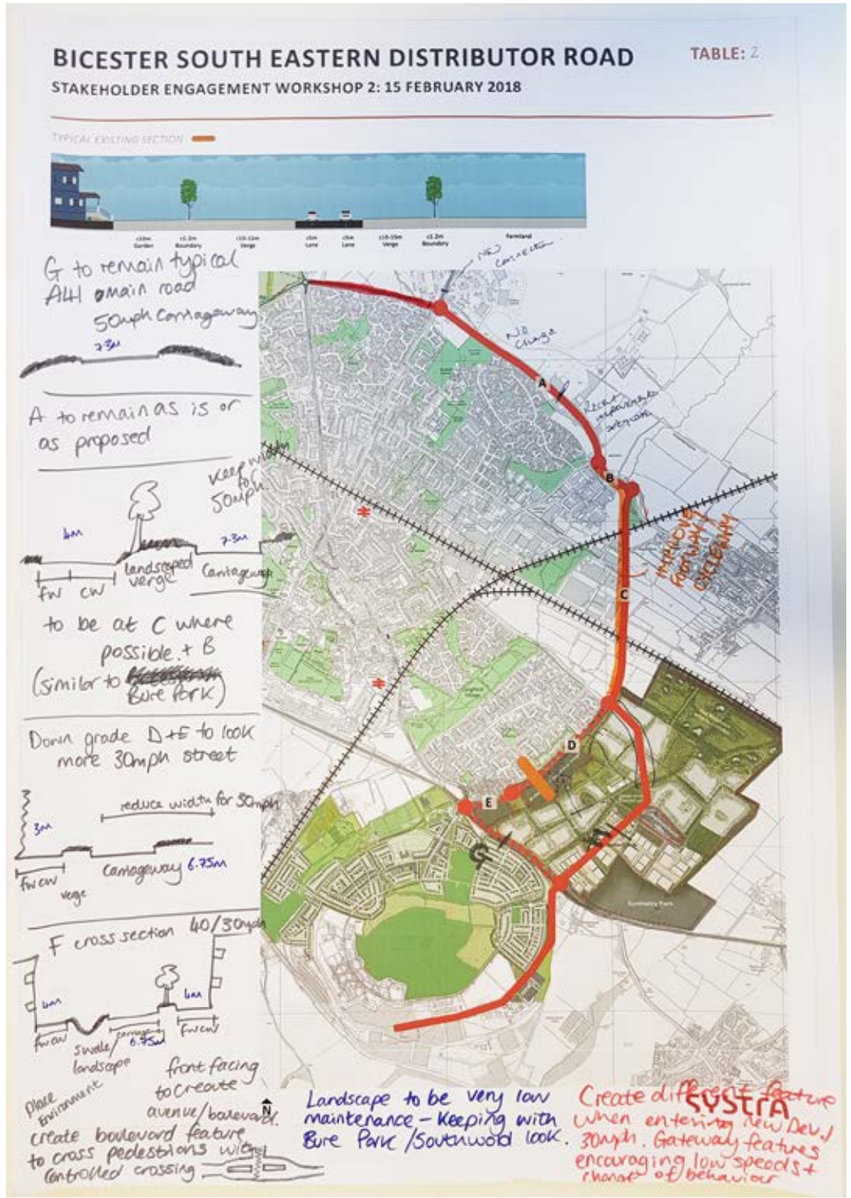


Design Strategy Legend

- Gateways into Bicester
- Edges- walking and cycling along road
- Edges- development overlooking road
- Beauty / Streetscape- Landscape
- Beauty / Streetscape- Public Art
- Crossings- Formal, plus desire lines
- Crossings- zones where people should be able to cross safely
- Zone where highway design / engineering manages speeds
- Improved Capacity
- Wildlife
- Extension to Study Area
- 30mph
- 40mph
- 50mph
- 70mph

1. (No explanation given)
2. More urban. Vehicle feeder roads. Space for central reservation for uncontrolled crossing points.
3. Key area. Main pedestrian / cycle. Consider within context of wider links. Link “E” should have pedestrian / cycle priority? Would limit central Bicester traffic.
4. Strengthen green buffer and link. Separate ?

TASK 3: DESIGN DEVELOPMENT



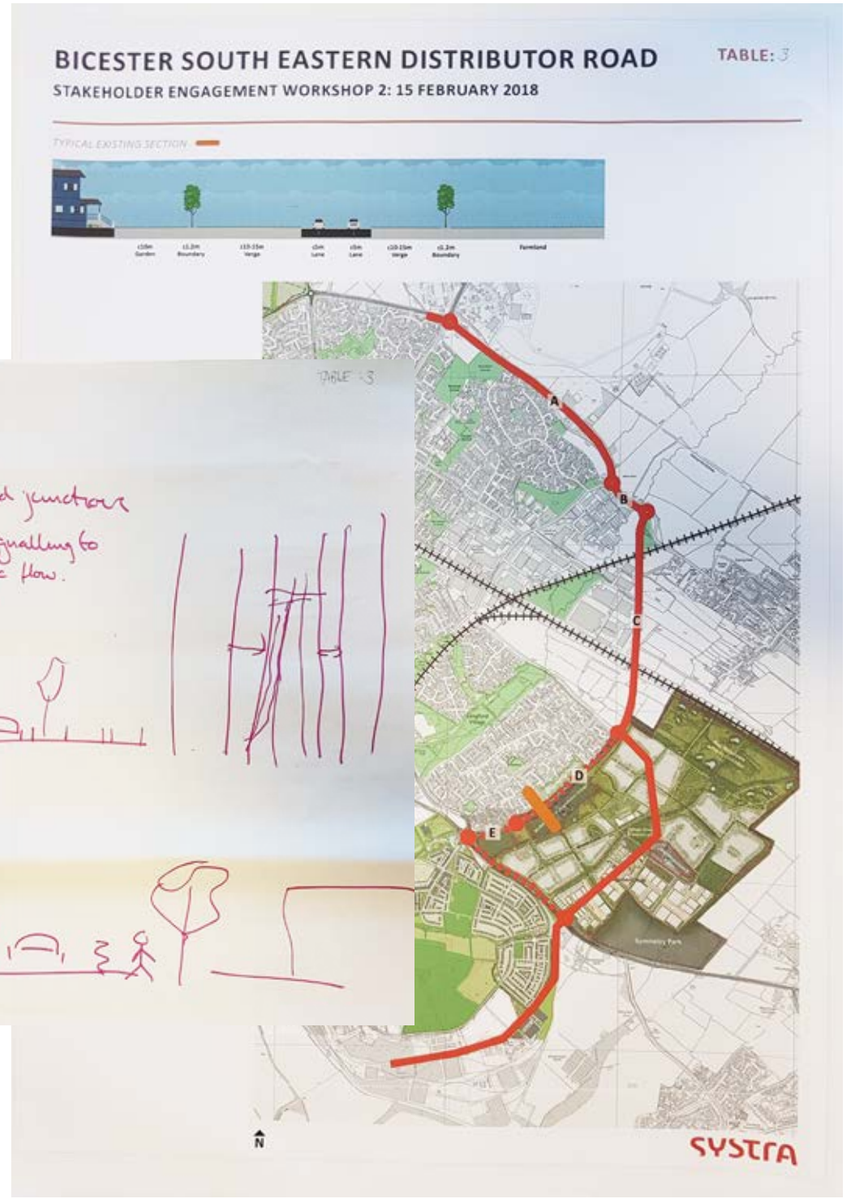
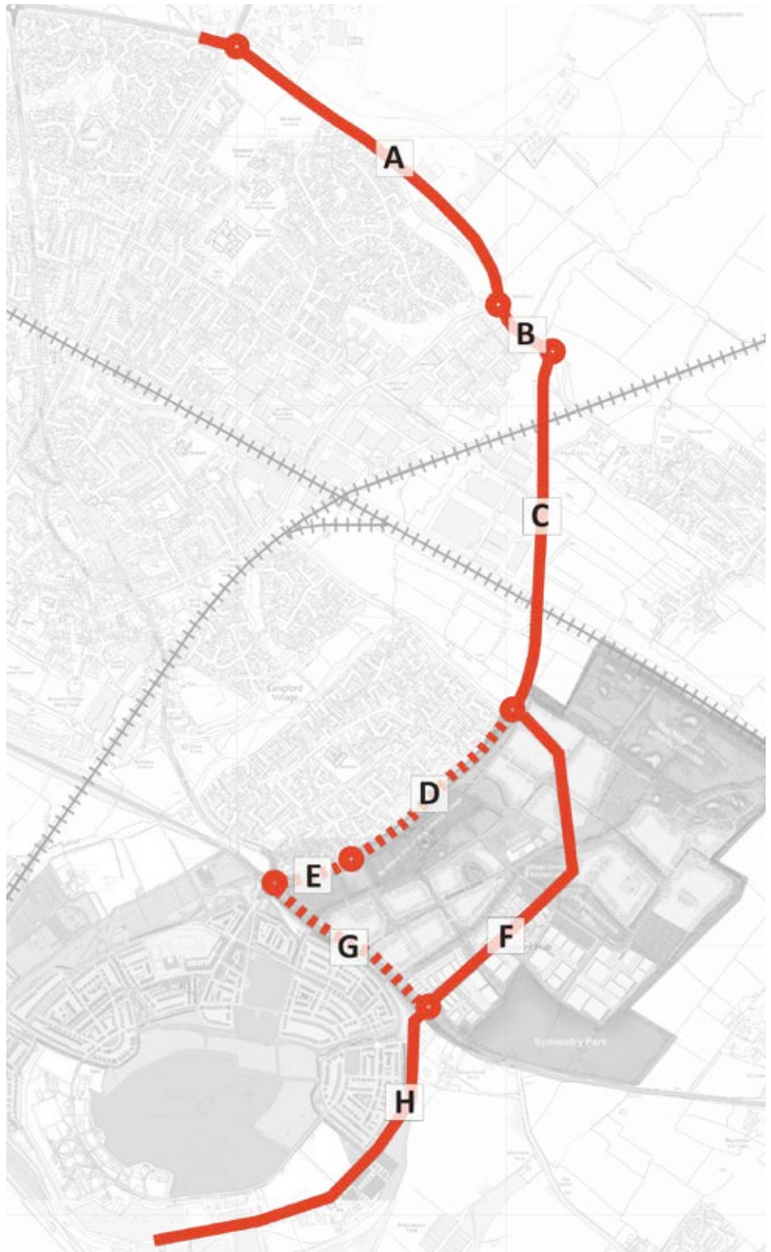

BICESTER SOUTH EASTERN DISTRIBUTOR ROAD
TABLE: 3
STAKEHOLDER ENGAGEMENT WORKSHOP 2: 15 FEBRUARY 2018
TYPICAL EXISTING SECTION
A
B
C
D
E
N
SYSTRA

TABLE 3
Roundabouts or
priority controlled junctions
→ Sequential signalling to
maintain traffic flow.
1
2


BICESTER SOUTH EASTERN DISTRIBUTOR ROAD
TABLE: 4
STAKEHOLDER ENGAGEMENT WORKSHOP 2: 15 FEBRUARY 2018
TYPICAL EXISTING SECTION
A
B
C
D
E
N
SYSTRA

SUGGESTIONS

- Use existing verges to accommodate segregated footways and cycleways
- Use existing verges to accommodate utilities
- Create woodland and wildlife corridors within the verges
- Introduce SUDs
- Create a green pedestrian and cycle bridge linking Ray Meadows to Langford
- Link “A” should remain as is
- Link “A” should be designed to keep speeds down to 40mph
- Improve footways and cycleways in Links “B” and “C”
- Links “B” and “C” should be altered to provide a 4m footway/cycleway separated from a 7.3m carriageway by a landscaped verge. Widths need to accommodate 50mph.
- Link “C” should be designed to keep speeds down to 40mph.
- Downgrade Links “D” and “E” to look more like a 30mph street, with a 3m footway/cycleway and 6.75m carriageway separated by a verge
- Link “D” should be 40mph. Keep the existing 10m carriageway but introduce a 2-3m median to facilitate pedestrian crossing. Introduce 3m pedestrian/cycle routes on each side of the carriageway, separated by a tree-lined verge.
- Link “D” requires two or three formal crossings but restrict number of light controlled crossings.
- Link “D” needs to remain attractive to HGVs.
- Link “F” should accommodate speeds of up to 40mph, with 4m footway/cycleway and 6.75m carriageway separated by a swale. Development should be front-facing to create an avenue/boulevard that offers controlled crossings for pedestrians.
- Link “F” should have frontage development on each side, and comprise a 6.5m carriageway (increase to 7.5m if HGVs will use this route), with 5m service roads either side, separated by tree-lined verges.



- Link “H” should be 30mph.
- Landscape should be very low maintenance, remaining in keeping with Bure Park.
- Create different features when entering the new development, with speeds of 30mph. Introduce gateway features that encourage low speeds and change of behaviour.
- Use roundabouts or priority controlled junctions.
- Use sequential signalling to maintain traffic flow.

SYSTRA