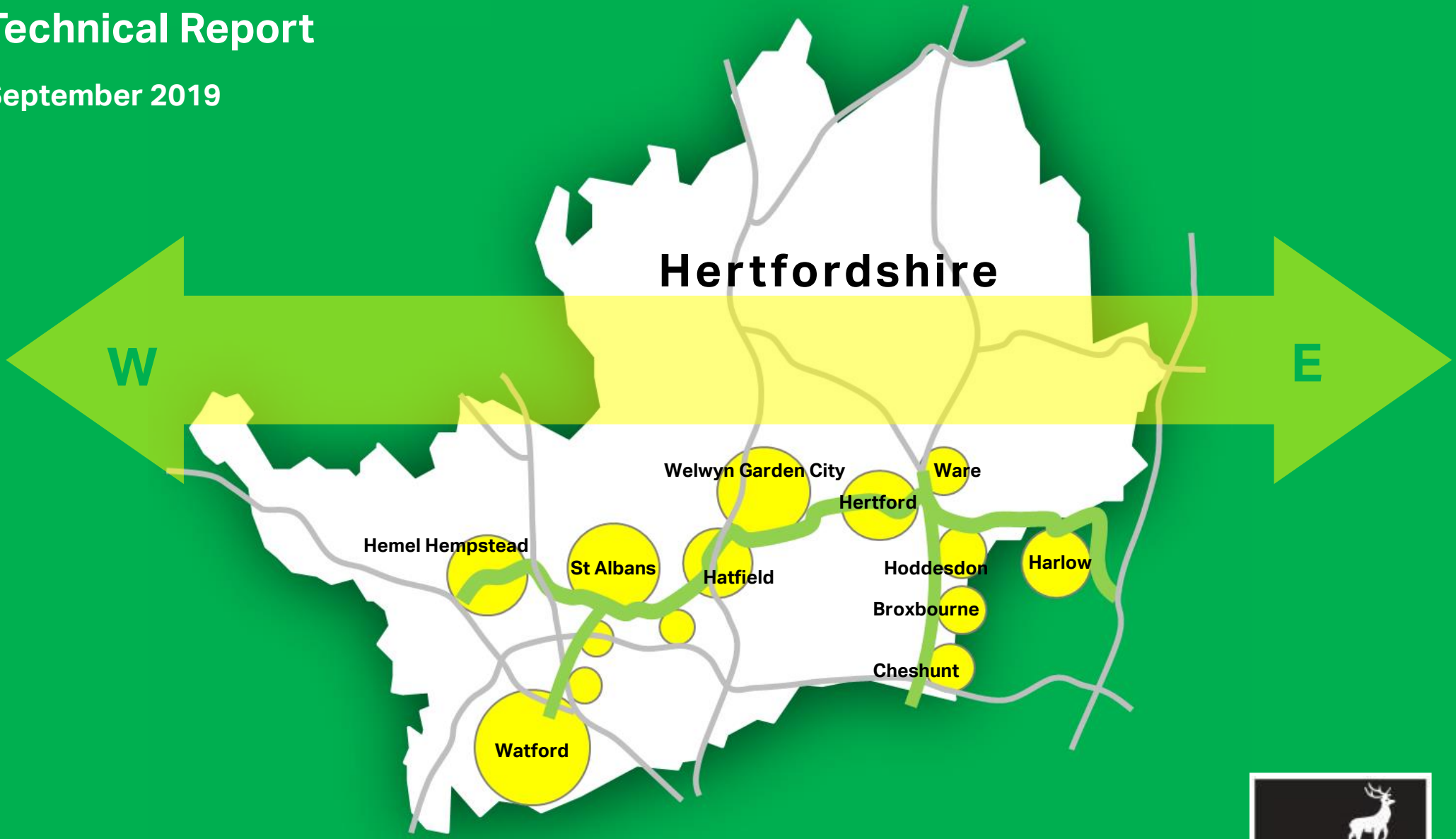
GrIPE CABINET PANEL - 22 OCTOBER 2019 - AGENDA ITEM 4

A414 Corridor Strategy

APPENDIX C

Technical Report

September 2019

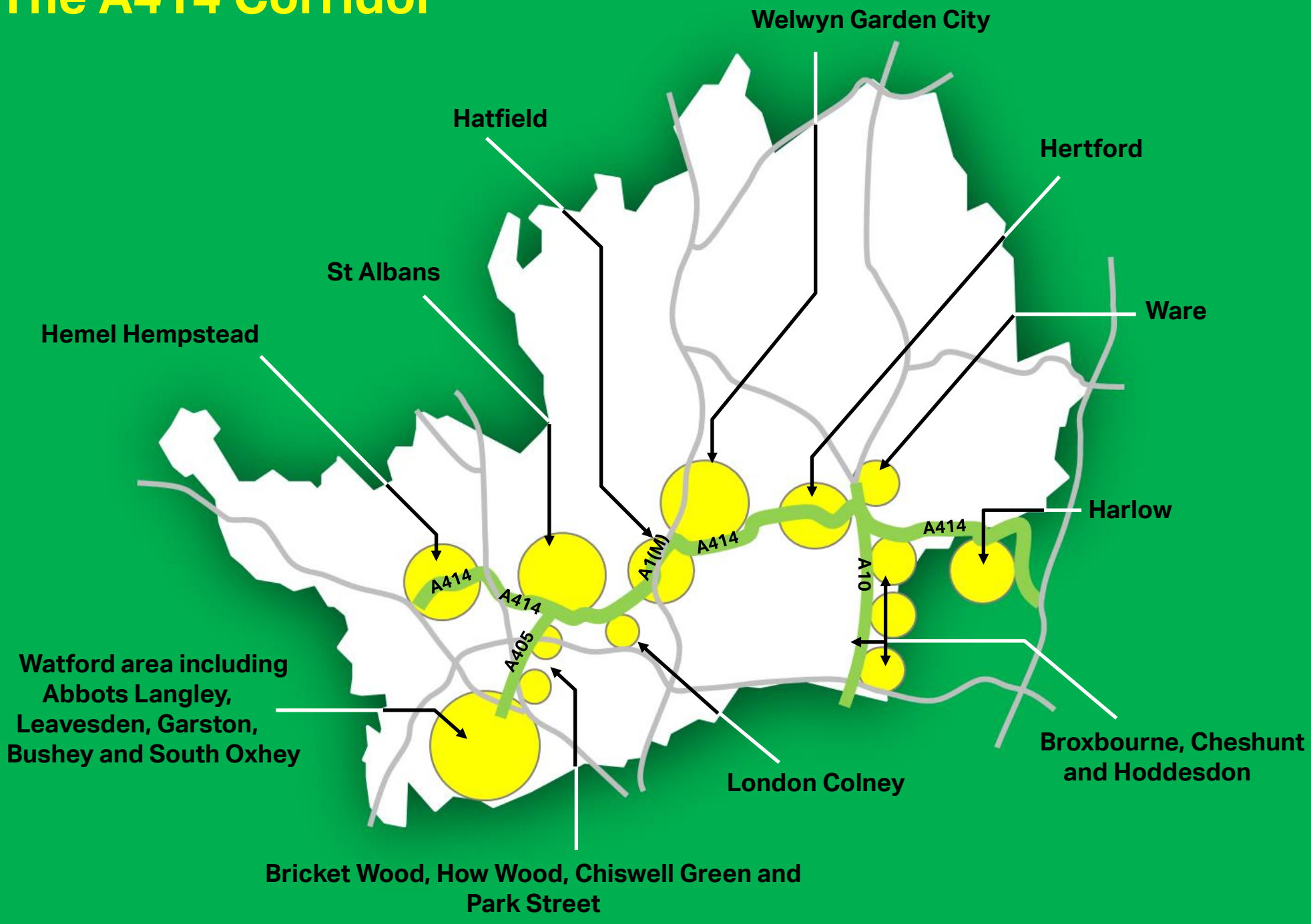


Hertfordshire

Contents

Annexes

The A414 Corridor



Foreword

The A414 corridor is the strategic east-west transport route in the County which runs from Harlow to Hemel Hempstead, with branches to Watford and Broxbourne. There are very few opportunities for continuous travel by public transport which increases reliance on the car to make even fairly short journeys along the corridor. There are also limited opportunities for walking and cycling, with poor and discontinuous routes in many areas.

There are over 100,000 new homes planned for Hertfordshire and fifty per cent of these will be along the A414 route, with further development expected beyond 2031. The impacts on the route are likely to be significant. Traffic congestion is predicted to increase further which will lead to longer journey times and more rat running onto less suitable roads for example if we do nothing.

The Local Transport Plan sets the County Council's long term transport strategy and provides a framework to guide all our future transport planning and investment. This framework has been used to develop the A414 Corridor Strategy. The emphasis will be providing alternatives to the car along the corridor through the development of a Mass Rapid Transit system which will provide a high quality, attractive, fast and continuous public transport link from Hemel Hempstead and Watford in the west, to Broxbourne and Harlow in the east serving key urban areas along the corridor including St Albans, Hatfield, Welwyn Garden City and Hertford. This system will crucially enable wider improvements to transport in the corridor to come forward including enhancements to local bus services, and better walking and cycling links. Assessment of the likely form and capacity of an Mass Rapid Transit system will determine the need for significant highway interventions at key locations on the A414 such as a Hertford Bypass.

Junctions improvements are also planned to help relieve traffic congestion, for example at M1 Junction 8 (Hemel Hempstead) and the A414/ A1081 London Colney Roundabout.

As the interventions in the strategy are developed from concepts into real deliverable schemes, advantage will be taken of emerging new technologies.

This Strategy builds on the principles set out in the Local Transport Plan and offers a vision for residents and users of the transport system to have reliable east-west travel options across Hertfordshire serving the growing population.

Derrick Ashley

Hertfordshire County Councillor

Executive Member, Growth, Infrastructure, Planning and the Economy

Executive Summary

The A414 corridor is a strategic east-west, multi-modal transport corridor extending from Harlow in the east to Hemel Hempstead in the west. In addition, the A405 extending down from St Albans towards Watford, and the A10 from west of Hertford to M25 Junction 25 in Broxbourne also act as important cross-county routes. Other key urban areas include Hatfield and Welwyn Garden City.

The corridor is extremely important in enabling people to move across Hertfordshire by different modes of transport including by car and bus. Today, the corridor experiences traffic congestion along sections of the A414 and at key junctions between and within towns. There are also very few opportunities for people to travel continuously by public transport which increases dependency on the car to make journeys along the corridor. There are also limited opportunities for walking and cycling, with poor and discontinuous routes in many areas.

Current levels of traffic congestion will increase even further if action is not taken, especially as there are at least 50,000 new homes and a similar number of new jobs planned across the corridor which will create more trips on the transport network.

Hertfordshire County Council has developed this A414 Corridor Strategy to confirm the key current and future growth and transport challenges and identify a set of interventions to help tackle these challenges.

This strategy has been developed around a set of eleven objectives:

- Support sustainable economic growth
- Improve inter-urban connectivity
- Define an appropriate route hierarchy
- Improve operation, resilience and reliability of the transport network
- Enhance sense of place and town centre viability
- Enable and facilitate modal shift to active travel
- Enable and facilitate modal shift to public transport
- Implement demand management to support efficient use of the network and enable behaviour change
- Incorporate the benefits of new technology to support efficient use of the network and enable behaviour change
- Ensure safe and secure travel
- Deliver better environmental outcomes

The corridor has been divided into fourteen geographical segments which reflect how the corridor is currently used differently along its length, and how it is predicted to be used in the future. Some segments carry more longer distance trips mostly by car and lorry. Other segments carry more of a mixture of shorter and longer distance trips with cycling, bus and rail also being used.

The A414 Corridor Strategy has drawn from existing adopted plans and strategies to develop a range of interventions which seek to address the growth in homes and jobs, and the transport challenges in the corridor. The interventions also align with the priorities described in Hertfordshire County Council's Local Transport Plan.

Thirty packages are proposed. Grouping interventions into packages recognises that some interventions work better together. Interventions

range from improvements to footways, new cycle routes, new bus services, better access to railway stations and highway junction improvements.

It is not easy to travel along the corridor by public transport. A new Mass Rapid Transit system will provide a high quality, attractive, fast and continuous public transport link from Hemel Hempstead and Watford in the west, to Broxbourne and Harlow in the east via the key urban areas along the corridor. This could take the form of a tram or high quality express bus network.

The Mass Rapid Transit is considered to be a critical piece of infrastructure as it will encourage people to travel more sustainably, connect people with jobs, schools, shops and key services, and could lead to a reduction in traffic growth. The Mass Rapid Transit will open up opportunities to improve walking, cycling and public transport routes and services by removing traffic. It should enable many of the interventions proposed in this strategy. In Hertford, the Mass Rapid Transit will route through the centre of the town, providing an attractive alternative to the car. A strategic intervention, for example a bypass, could be required to enable the MRT in Hertford.

Junctions will be improved to help relieve traffic congestion, for example at M1 Junction 8 (Hemel Hempstead) and the A414/A1081 London Colney Roundabout.

As well as these interventions there will also be a broader set of initiatives aimed at encouraging more people to walk, cycle and travel by public transport. The aim is to make better use of existing infrastructure and services; to discourage traffic using less appropriate roads through quite villages and past schools to avoid traffic congestion elsewhere; remove barriers to people travelling on foot or by bike; and providing a real alternative to the car for travelling between towns.

Many of the interventions are only concepts at this stage so there will need to be more detailed investigations and consultation with local people who could be affected by them.

If however circumstances change, for example key housing and employment developments do not come as planned, or new priorities begin to emerge, a review of the Corridor Strategy may lead to a potential revision or evolution of the proposals. The delivery of the A414 Corridor Strategy will be described in a separate **Implementation Plan.**

If supported and approved, interventions will be adopted by Hertfordshire County Council in partnership with the Local Planning Authorities as well as infrastructure operators, service providers and private developers. Further discussions with local communities will be essential. In many cases, there will need to be detailed business cases that assess overall value for money and wider impacts on society and the environment.

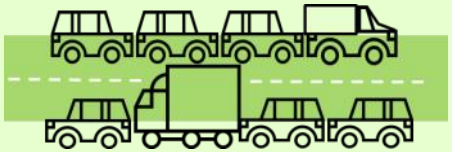
Funding is also critical. Local Authorities are increasingly reliant on making bids to funding competitions by Central Government or obtaining contributions from private developers. It is important therefore that a robust case can be put forward for successfully obtaining funds. The availability of sufficient funding will play a crucial role in the implementation of proposals put forward.

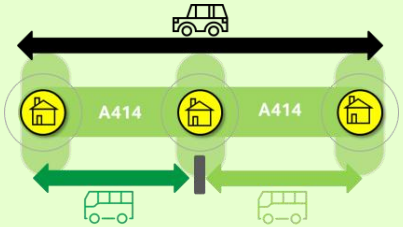
A414 Corridor Strategy in brief

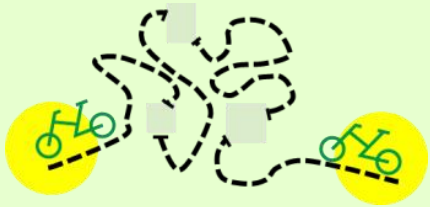
Planned Growth

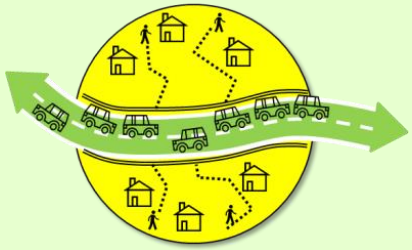
50,000+ new homes and 50,000+ new jobs will create additional travel demand on the corridor's transport network including highway routes and public transport services.

The challenges





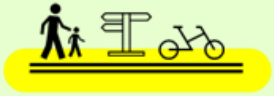




Highway congestion is predicted to increase leading to longer journey times. Making journeys by public transport along the corridor is not easy and convenient. It is not easy to travel by bike within and between some urban areas. Communities can be split by heavily trafficked roads which can be made worse where crossing facilities for pedestrians and cyclists are limited.

The proposed response

A re-prioritised highway network



Enhanced walking and cycling links

Highway upgrades

Enhanced urban realm

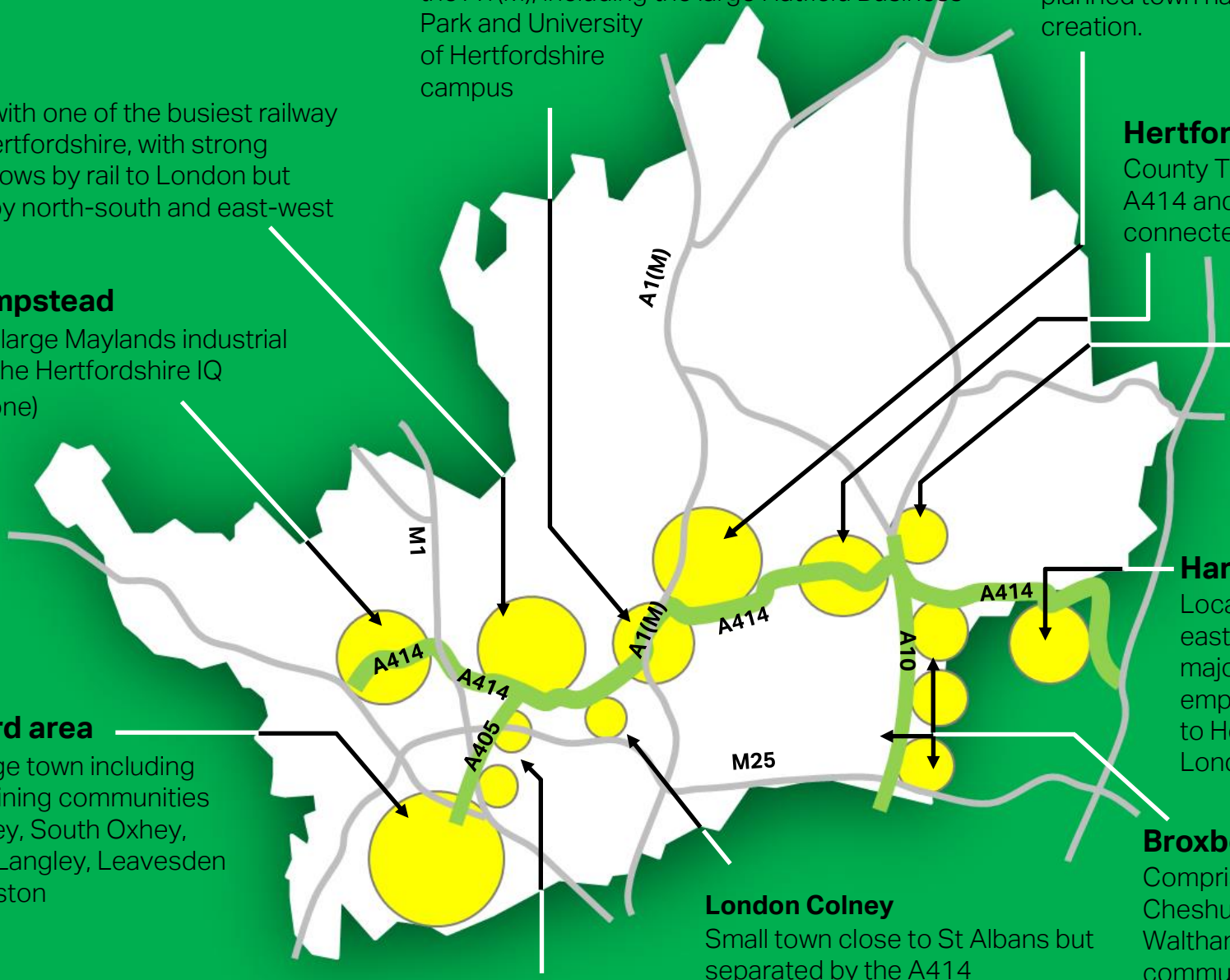
Better Public Transport connectivity and accessibility

30 packages of wide-ranging interventions aim to address the corridor challenges, improve inter-urban connectivity, improve operation, resilience and reliability of the transport network , enable and facilitate modal shift to active travel and public transport plus much more.

Total estimated cost of all interventions **Up to £1.3bn**

£ £ £ £ £ £ **Sufficient funding needs to be found to deliver interventions**

The corridor



Hatfield
20th Century New Town where the A414 meets the A1(M), including the large Hatfield Business Park and University of Hertfordshire campus

Welwyn Garden City
Adjacent to the A1(M) and A414, this planned town has expanded since its creation.

St Albans
Historic city with one of the busiest railway stations in Hertfordshire, with strong commuting flows by rail to London but surrounded by north-south and east-west highway links

Hertford
County Town, divided by the busy A414 and two railway stations connected to London

Hemel Hempstead
Including the large Maylands industrial area (part of the Hertfordshire IQ Enterprise Zone)

Ware
Market town with close links to Hertford and bypassed by the A10

Harlow
Located in Essex at the eastern end of the corridor, a major location for employment with strong links to Hertfordshire as well as London and Stansted

Watford area
Very large town including the adjoining communities of Bushey, South Oxhey, Abbots Langley, Leavesden and Garston

London Colney
Small town close to St Albans but separated by the A414

Broxbourne Towns
Comprise Broxbourne, Cheshunt, Hoddesdon, Waltham Cross and adjoining communities of Goffs Oak and Hammond Street, dissected by the A10 highway route which links the A414 and M25

Bricket Wood, How Wood, Chiswell Green and Park Street
Smaller towns and villages located along the A405 and Abbey Line routes

1 Introduction

The A414 Corridor is a strategic east-west multi-modal transport corridor extending from Harlow in the east to Hemel Hempstead in the west. In addition, the A405 extending down from St Albans towards Watford, and the A10 from east of Hertford to M25 Junction 25 also act as important cross-county routes.

The provision of transport infrastructure and facilities varies significantly along the length of the corridor. Today different parts of the corridor experience traffic congestion on roads, and there are very limited opportunities for continuous travel by public transport. The A414, A10 and A405 roads themselves carry a lot of traffic between towns along the corridor but at a local level the presence of wide roads and fast moving traffic can disconnect local communities and create issues for people wanting to travel on foot or by bike.

Current levels of traffic congestion will only be made worse by planned new homes and jobs in the coming years unless action is taken to enable people to travel more sustainable on foot, by bike and by public transport. At least 50,000 new homes and a similar number of new jobs are proposed within the corridor to 2031.

The A414 Corridor Strategy is therefore necessary to ensure the corridor can adequately cater for a diverse range of journey lengths and purposes in the short, medium and long term, and facilitate sustainable growth.

The aims of the A414 Corridor Strategy are to:

- **Encourage joined up decision making and proposals**
- **Consider the A414 corridor as a network of transport links and services used for different purposes within and between towns**
- **Clarify what infrastructure is needed along the corridor to improve people's journeys and help bring forward new homes and jobs**
- **Identify potential funding opportunities and set out a route to delivery for packages of interventions**
- **Support development along the corridor and help manage and improve inter-urban movement**

This A414 Corridor Strategy Technical Report sets out the rationale for the Corridor Strategy, supporting evidence and proposed packages of interventions to get the corridor ready for the future.

For a shorter summary of the strategy's proposals, please refer to the separate A414 Corridor Strategy Summary Report.

Report Structure

Section 2... An overview of the corridor in terms of the key towns, the transport network and services

Section 3 ... How the strategy has been developed, supporting documents and underlying policies

Section 4 ... Planned housing and employment growth along the corridor and the wider area

Section 5 ... The key growth and transport challenges the corridor faces now and in the future

Section 6 ... The objectives for the A414 corridor

Section 7 ... An overview of the transport interventions proposed in the Corridor Strategy

Section 8 ... A summary of a potential Mass Rapid Transit system which will span the A414 corridor

Section 9 ... Consideration of what can be achieved with the proposals put forward in the Corridor Strategy

Section 10 ... Concluding the Corridor Strategy and estimated cost ranges

What then follows is a series of technical annexes which provide more detailed information.

Annex 1 - Annex 14 cover the fourteen corridor segments and provide more information on the challenges, priorities and proposed packages of interventions within each segment.

Annex 15 provides more detailed information on a proposed Mass Rapid Transit.

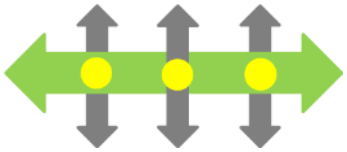
Annex 16 describes the sifting and evaluation process used to develop the packages of interventions.

Annex 17 summarises the approach to assessing place and movement functions of the highways network across the A414 Corridor.

2 | Corridor Overview

The A414 Corridor is a strategic east-west transport corridor which runs from Harlow (to the east of Hertfordshire's boundary with Essex) to the south of St Albans, where it separates with one leg running to Hemel Hempstead as the A414 and the other running through to Watford as the A405.

It directly connects the key towns of Harlow, Hatfield, St Albans, Hemel Hempstead and Watford, and provides connectivity across large parts of Hertfordshire including many smaller towns, as well as connecting Harlow with Chelmsford in Essex.



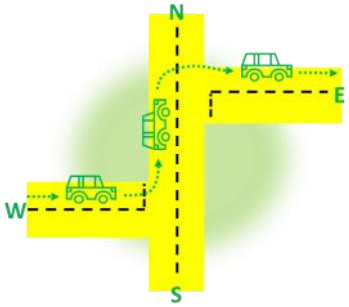
From west to east, the corridor connects with the A41 (London to Aylesbury), West Coast Main Line (London to Scotland), M25 (London Orbital), M1 and Midland Main Line (London to The North via the East Midlands, Sheffield and Leeds), A1/A1(M) (London to Scotland), East Coast Main Line (London to Scotland), Hertford Loop branch line (London to Stevenage), West Anglia Main Line and A10 (London to King's Lynn via Cambridge) and the M11 (London to Cambridge). The corridor covers a distance of approximately 48km (30 miles).

Currently the corridor better serves the needs of people travelling by car and commercial goods vehicles, with more limited public transport links and facilities for people walking and cycling.

The main road running through the corridor is the A414 which is mainly 2-lane dual carriageway but with pinch-points comprising single lanes in each direction within Hertford (beneath the Hertford Loop branch line of the East Coast Main Line), Hatfield (between A1001 Great North Road and Mount Pleasant Road), Hemel Hempstead (Two Waters Road) and Harlow.

Some sections of the A414 run through towns including Hertford and Hemel Hempstead; other sections are more rural including the section between Hertford and Hatfield/Welwyn Garden City.

Junctions are formed of roundabouts, some which are very large and include traffic signals. There are different speed limits across the corridor depending on the urban/rural setting.



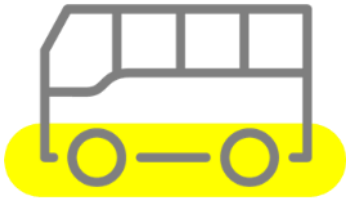
The A414 is not a continuous route. There are 'dog legs' where east-west traffic has to use sections of north-south routes including the M1 at Hemel Hempstead , the A1(M) at Hatfield and the A10 between Hoddesdon and Hertford.

The section of the A414 between Park Street and M1 Junction 8 is managed by Highways England as part of their Strategic Road Network. The remaining sections are managed by Hertfordshire County Council (HCC). Essex County Council manages the section through Harlow.

The A405 (North Orbital Road) is entirely dual carriageway along its length and can be considered more urban and semi-urban in character. It connects with the A41 in northern Watford. It intersects with the A412 which connects into the centre of Watford.

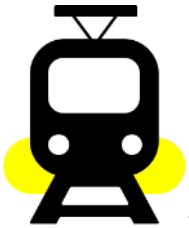
The section of the A405 between M25 Junction 21a and M1 Junction 6 (North Orbital Road, Bricket Wood) also forms part of Highways England's network and facilitates movement between the M25 and the M1(London).

There are a number of sections of cycle routes linking towns within the corridor, however they are of varying quality and there are gaps which makes it hard for people to reach their destination. Immediately parallel to the A414 south of St Albans there is a shared footway/cycle route, and there are several cycle routes within the corridor which are set away from main roads including the Alban Way and Cole Green Way (both forming part of National Cycle Route 61).

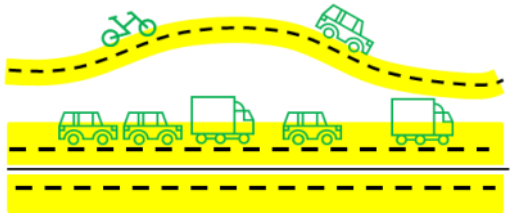


Passenger transport is limited to bus services which serve sections of the route. For example, bus service 300/301 between Hemel Hempstead and Stevenage via Welwyn Garden City, St Albans and Hatfield. Bus service 724 runs between Rickmansworth, Watford, St. Albans, Hatfield, Welwyn Garden City, Hertford, Ware and Harlow and is the only continuous end-to-end passenger transport service operating across the corridor (it also extends onto Heathrow Airport). A timetabled journey time from Watford to Harlow is around 2 hours 15 minutes using the 724 service.

Other more local bus services run within and between towns along the corridor.



The single track Abbey Line provides rail services between St Albans Abbey and Watford Junction railway stations via Park Street, How Wood, Bricket Wood and Garston on a service frequency of 45 minutes and a journey time of around 20 minutes. There is however no continuous railway east-west across Hertfordshire. Many former railway branch lines were closed in the 1950s and 1960s, including routes between St Albans and Hatfield, and Welwyn Garden City and Hertford. Some of these former railway alignments have since been converted to attractive leisure routes for cyclists and pedestrians.



There are a number of notable parallel and adjoining highway routes within the corridor including the A4147 (linking Hemel Hempstead and St Albans), A1001 Comet Way (running broadly parallel to the A1(M) in Hatfield), A1057 Hatfield Road (linking St Albans and Hatfield), B1000 (linking Welwyn Garden City and Hertford), A119 (linking Hertford and Ware), A1070 (linking Ware and Broxbourne), and B1502 Stanstead Road (linking Rush Green and Hoddesdon). These routes can act as alternatives to the A414 but can also experience congestion themselves.

Towards the eastern end, the A10 runs north-south through Hertfordshire. A section of the A10 between Hertford/Ware and Hoddesdon carries both north-south A10 traffic as well as east-west A414 traffic. The section of the A10 to the south through Broxbourne is

more urban in character with houses and businesses facing onto the road.

The A10 could become increasingly relevant in the context of the A414 corridor in the future in terms of route choice to/from the M25 for more strategic journeys.

There are two designated Enterprise Zones (EZ) which are located within the corridor.

The Hertfordshire IQ EZ is located across several sites in the south-west of Hertfordshire including the large Maylands industrial area in eastern Hemel Hempstead, the BRE site in Bricket Wood and Rothamsted Research in Harpenden. The EZ is strongly tied to the A414, A405 and M1 which are important connections for employees, for transporting goods and attracting new business.

The Harlow EZ is located at the eastern end of the corridor and relies on the A414, M11 and West Anglia Main Line to provide connections between towns. Harlow Science Park provides a significant development opportunity with a focus on creating a Med Tech Campus, bringing together research, innovation and manufacturing. Kao Park will comprise a large data centre complex and business park. These new employment areas will join the established Templefields industrial estate which accommodates business properties including manufacturers and distributors.

There are other notable employment centres across the corridor.

Watford is currently home to around 3,500 businesses with a good mix of company size and sector, with many international headquarters and a higher than average start-up success rate, and a range of businesses in between. There is representation from financial and professional services sectors, pharmaceutical, health sciences, creative media, manufacturing and retail and leisure industries, amongst many others.

Located broadly in the centre of the corridor is Hatfield Business Park which hosts business space generating 13,500 jobs and the adjacent University of Hertfordshire campus. This is where the A414 connects with the A1(M) and is therefore an important intersection between east-west and north-south travel.

The Mundells industrial area in Welwyn Garden City is host to office and light industrial businesses creating employment in the town and beyond.

Hoddesdon Business Park is located on the eastern edge of Hoddesdon, and is the largest employment area in Broxbourne. It accommodates around 200 businesses including warehouses and specialist manufacturers, and has approximately 5,500 employees. The business park relies on the A10 to provide links with more strategic routes such as the A414 and the M25.

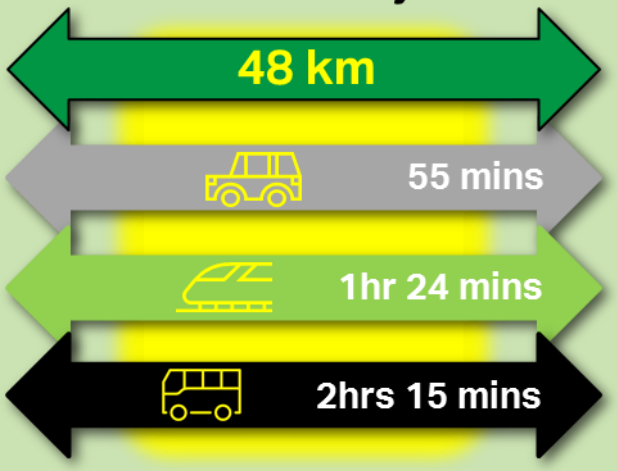
The Park Plaza area at the southern end of the A10 in Broxbourne is a major location for new employment development. A total of approximately 140 hectares of land is allocated to employment-related land uses.

Brookfield Retail Park is located to the west of the A10 corridor in Cheshunt, and is home to a number of well known high street retailers. The scale of the retail park means that it is a major draw for shoppers not just from the immediate area of Broxbourne, but much further afield.

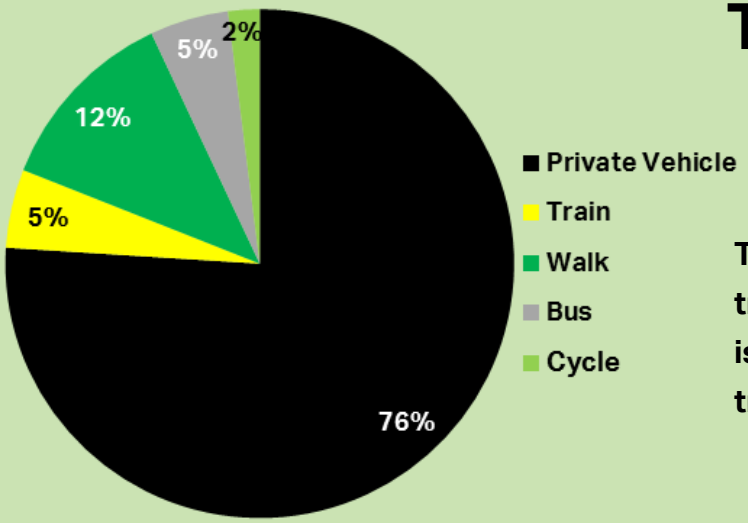
The corridor today

Resident Population in corridor towns (2016)	
Bricket Wood	4,100
Broxbourne	17,500
Cheshunt	41,300
Harlow	85,900
Hatfield	43,800
Hemel Hempstead	92,700
Hertford	27,900
Hoddesdon	21,800
London Colney	9,400
St Albans	74,600
Waltham Cross	10,800
Ware	19,900
Watford	110,500
Welwyn Garden City	50,600

Corridor Journey Times



Based on an AM peak journey between Watford and Harlow. Journey by train is assumed to route via London.



Travel mode share for commuting trips to towns in the A414 corridor is dominated by private vehicle trips.

The following roads within the A414 corridor are among the 25 most heavily trafficked roads in Hertfordshire.

Rank	Road	Averaged flow across full road length (average weekday traffic)
1st	M1	142,275
3rd	A1(M)	69119
5th	A414	34,177
8th	A405	31,657
9th	A10	29,023
12th	A6129 (Welwyn-Hatfield)	27,507
13th	A414 (old M10)	26,720
18th	B4630 (Chiswell Green)	21,188
19th	A4147 (Hemel Hempstead-St Albans)	21,165
23rd	A1081 (Luton-Barnet)	18,306

Maylands industrial area is a major employment centre and part of the Hertfordshire IQ Enterprise Zone

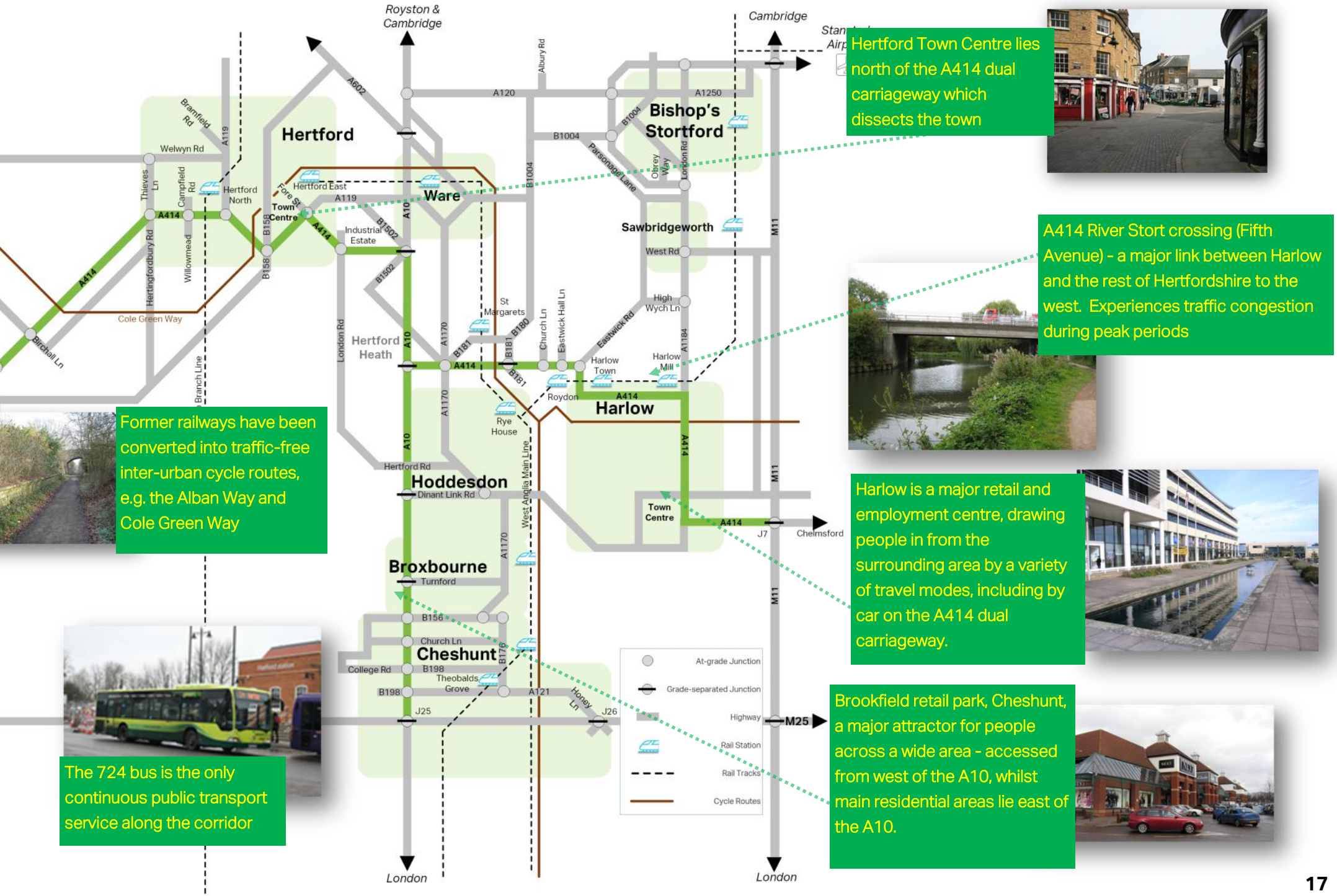
The Plough Roundabout, referred to locally as the Magic Roundabout

M1-M25 interchange - not all movements are catered for, with some traffic using the A405

The single track, electrified, low frequency Abbey Line runs between St Albans and Watford

Hatfield Business Park and University campus - a major attractor for commuting journeys

Key junctions including the longabout at Smallford facilitate access to/from the A414



Hertford Town Centre lies north of the A414 dual carriageway which dissects the town

A414 River Stort crossing (Fifth Avenue) - a major link between Harlow and the rest of Hertfordshire to the west. Experiences traffic congestion during peak periods

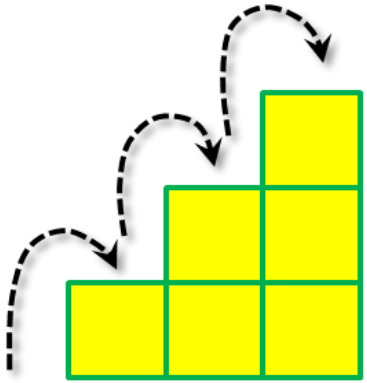
Former railways have been converted into traffic-free inter-urban cycle routes, e.g. the Alban Way and Cole Green Way

Harlow is a major retail and employment centre, drawing people in from the surrounding area by a variety of travel modes, including by car on the A414 dual carriageway.

The 724 bus is the only continuous public transport service along the corridor

Brookfield retail park, Cheshunt, a major attractor for people across a wide area - accessed from west of the A10, whilst main residential areas lie east of the A10.

3 | Developing the Strategy



A staged approach has been taken to develop the A414 Corridor Strategy.

The approach commenced with a process of clarifying the broad aims and objectives of the strategy, through to reviewing evidence to confirm the key challenges that need to be addressed on the corridor.

Objectives were then confirmed for what needs to be achieved along the corridor.

Finally, a range of options were considered for how challenges could be addressed, and this involved referring to plans and strategies that have already been prepared and identifying new transport improvement interventions. These interventions were then grouped into packages.

Reference should be made to the **A414 Corridor Strategy Evidence Report** which sits alongside this report. The Evidence Report brings together a wide range of data sets to help build a picture of the A414 corridor both today and in the future. Datasets include journey times, modes of travel used and socio-demographic data (e.g. population statistics) as well as information on the environment and land uses.

In addition this Corridor Strategy is supported by the appropriate statutory requirements for Habitats Regulations, Equality Impact Assessment and Strategic Environmental Assessment.

These are available as part of the A414 Corridor Strategy.

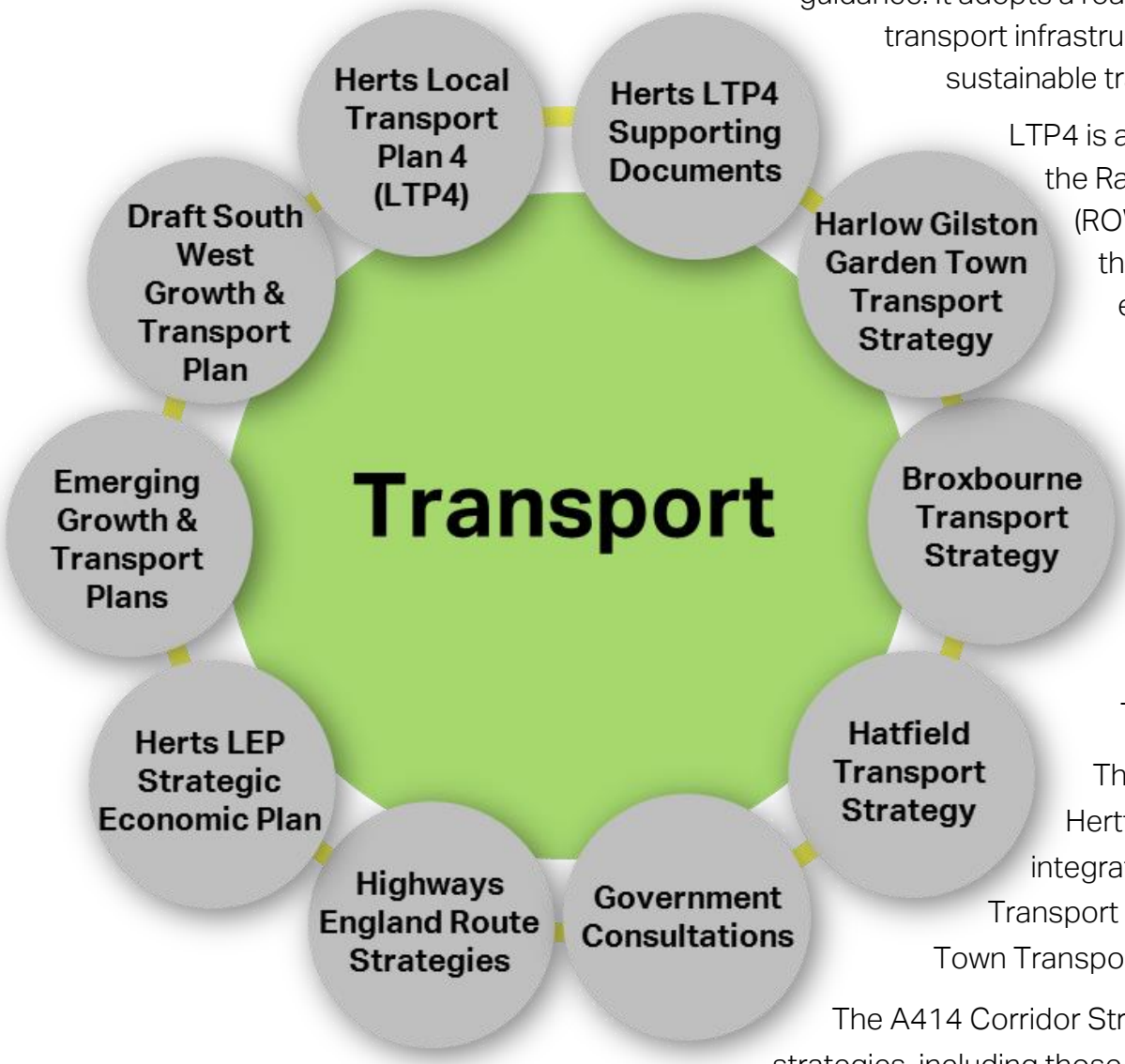
Supporting plans and policies

The A414 Corridor Strategy aligns with objectives and proposals both from a Growth perspective (the provision of land for housing and employment development, and the planning and management of places) and a Transport perspective (the provision of a sustainable travel and transport network accessible by all).

Planned new homes and jobs are identified by Local Planning Authorities (in Hertfordshire, the districts and boroughs) in their Local Plans. These plans set out planning policies, identify how land should be used, and determine the type and quantity of development that should be built where and by when. They should also be consistent with the National Planning Policy Framework.

Typically Local Plans are prepared at different times. Some authorities may have a recent, adopted plan in place whereas others may still be in the process of preparing a new plan.

It is important for the Corridor Strategy to align with key policies in Local Plans because the corridor is expected to be a focus for major housing and employment growth. This includes policies from Hertfordshire County Council's Waste Development Framework and the Proposed Submission Minerals Local Plan.



Hertfordshire County Council's Local Transport Plan (LTP4) sets out the vision of where transport in Hertfordshire should be heading and gives high level policy guidance. It adopts a road user hierarchy to deliver a shift in the approach taken to transport infrastructure away from prioritising private vehicles towards sustainable transport modes.

LTP4 is accompanied by a series of supporting documents, such as the Rail Strategy and the Rights of Way Improvement Plan (ROWIP). The ROWIP identifies gaps and severance issues in the Rights of Way network, which provides important east-west links within the A414 corridor. A set of Growth and Transport Plans (GTPs) span the A414 corridor area. The South West Hertfordshire GTP covers the Watford and Hemel Hempstead area plus their connections to St Albans. This GTP was adopted in 2019.

The emerging draft South Central Hertfordshire GTP covers St Albans, Hatfield, Welwyn Garden City, London Colney, Potters Bar and Borehamwood. This GTP integrates proposals initially put forward in the Hatfield Transport Strategy, and will be consulted on during 2019.

The emerging draft South East Hertfordshire GTP covers Hertford, Ware, the Broxbourne Towns and Harlow. This GTP integrates the proposals initially put forward in the Broxbourne Transport Strategy and the emerging draft Harlow Gilston Garden Town Transport Strategy.

The A414 Corridor Strategy also seeks to influence other future plans and strategies, including those being developed by Highways England who manages the strategic road network. Consultation, proposals and initiatives led by Central Government could also influence the Corridor Strategy.

4 | Planned Growth

The corridor faces unprecedented levels of housing and employment growth, which is likely to have a significant impact on how the corridor's transport system functions in the future.

Emerging local development plans from Hertfordshire's local planning authorities indicate that an additional 50,000 homes will be needed within a 5 mile radius of the A414/A405 in the next 15 years.

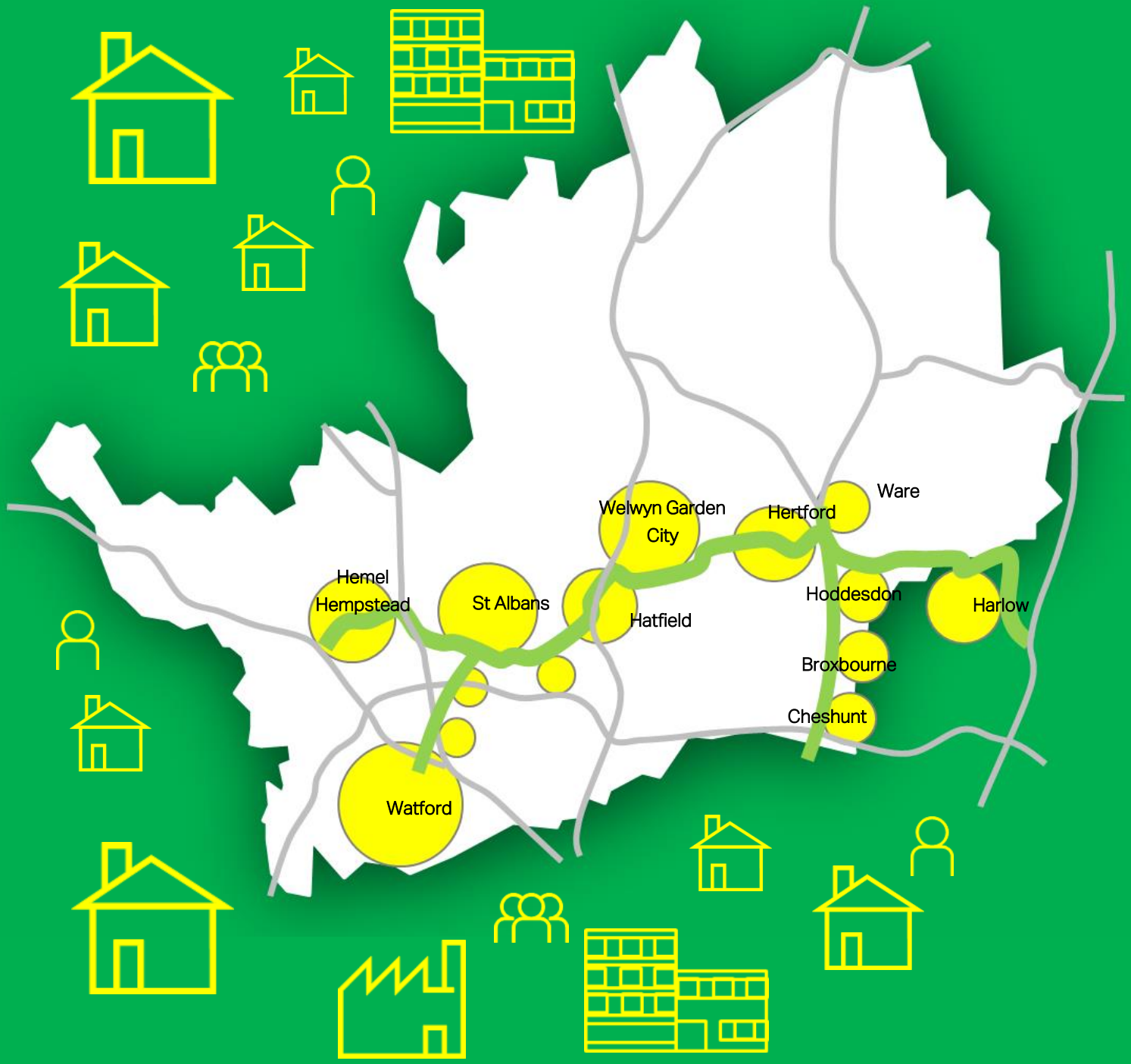
This will result in an estimated 110,000-120,000 increase in population based on average household occupancy. Beyond 2031 it is likely that further growth will be allocated along the corridor, adding pressure and new travel demands upon the transport system.

Employment is also expected to rise, with a number of major employment sites proposed. Employment densities tend to be highest in town centres, but there are multiple out-of-town areas which have high employment densities as a result of business parks including Maylands Industrial Park (Hemel Hempstead), Hatfield Business Park, and Harlow Industrial Estates. In addition, the Hertfordshire IQ Enterprise Zone is located in the western end of the corridor, incorporating Maylands Industrial Area. These areas will be focal points for significant employment growth, as well as the proposed Strategic Rail Freight Interchange between Radlett and St Albans. Watford is expected to continue as a regional centre for employment and retail, due to its close proximity and links to London. Hatfield Business Park and the University of Hertfordshire campus will continue to be a focus for education, employment, innovation and research.

Therefore, it is anticipated that current transport pressures and movements will be put under additional pressure by the significant levels of housing and employment growth already in the planning system and additional growth in the future. A range of interventions will be required to help address and mitigate these impacts and enable growth.

Reference should be made to local planning authorities' Infrastructure Delivery Plans for an up to date record of emerging infrastructure schemes related to growth.

50,000+ extra homes
50,000+ extra jobs
110,000-120,000 extra people



Estimated **50,000+** additional homes could come forward by 2031 along the corridor in Hertfordshire

Plus estimated **80,000+** additional homes in immediately adjacent authority areas

A similar number of **additional jobs** are also estimated to come forward within the same time frame

Key development sites

Below is a selection of key housing and employment development locations within the corridor either in adopted or emerging Local Plans

East Hemel Hempstead broad locations (North and South sites)

Between Maylands industrial area and the M1, two broad locations have a minimum capacity of **4,050** dwellings across both the North and South sites.

Hertfordshire IQ Enterprise Zone (East Hemel Hempstead)

A major new Enviro-Tech focused employment location, including enhanced transport infrastructure for new and existing employment and residential areas, within an approximately 55 Ha area . Has the potential to offer in the order of **10,000** jobs.

East St Albans broad location

An urban extension of St Albans, improved and new education and training facilities, and to further integrate Oaklands College with the wider community, with a minimum capacity of **1,250** dwellings.

Park Street Garden Village broad location

A new Garden Village including a secondary school and country park with a minimum capacity of **2,300** dwellings (600 dwellings beyond 2036).

West of London Colney broad location

An urban extension of London Colney including a new secondary school and a minimum capacity of **440** dwellings.

North West Hatfield and Symondshyde

NW Hatfield urban extension comprises approximately **1,650** dwellings and the by 2032, whilst the standalone Symondshyde village development comprises around **1,130** dwellings by 2032

Broadwater Road West (Welwyn Garden City)

Located in the town centre adjacent to the East Coast Main Line, this former industrial site is allocated for approximately **1,020** dwellings by 2032.

Birchall Garden Suburb (Welwyn Garden City)

Birchall Garden Suburb lies to the east of Welwyn Garden City just to the north of the A414. Approximately **2,550** dwellings are proposed by 2032.

West of Hertford

Straddling the B1000 Welwyn Road on the western edge of Hertford, this development will accommodate **550** dwellings with new vehicle access arrangements onto the surrounding highway network. Mead Lane (**200** dwellings) will also affect the surrounding highway network.

Land North and East of Ware

Land to the north and east of Ware is allocated as a mixed-use development site, to accommodate between **1,000** and **1,500** dwellings (subject to satisfactory transport mitigation) and **3 hectares** employment land by 2033.

Harlow Gilston Garden Town

Harlow Gilston was designated as a Garden Town in 2017. At least **23,000** dwellings are planned, with 16,000 of them built by 2033 in new communities to the north (Gilston Area), south (Latton Priory), east (East of Harlow) and west (Water Lane) of Harlow.

Brookfield Riverside and Brookfield Garden Village (Broxbourne)

Planned redevelopment of the Brookfield area as a comprehensively planned garden suburb encompassing retail, civic and leisure centre for the borough of Broxbourne, a business campus and Brookfield Garden Village. **43,500** square metres of additional retail and leisure space plus **30,000-50,000** square metres of additional business space will deliver a significant number of new jobs. Both sites will deliver around **1,500** dwellings.

5 | Key Challenges

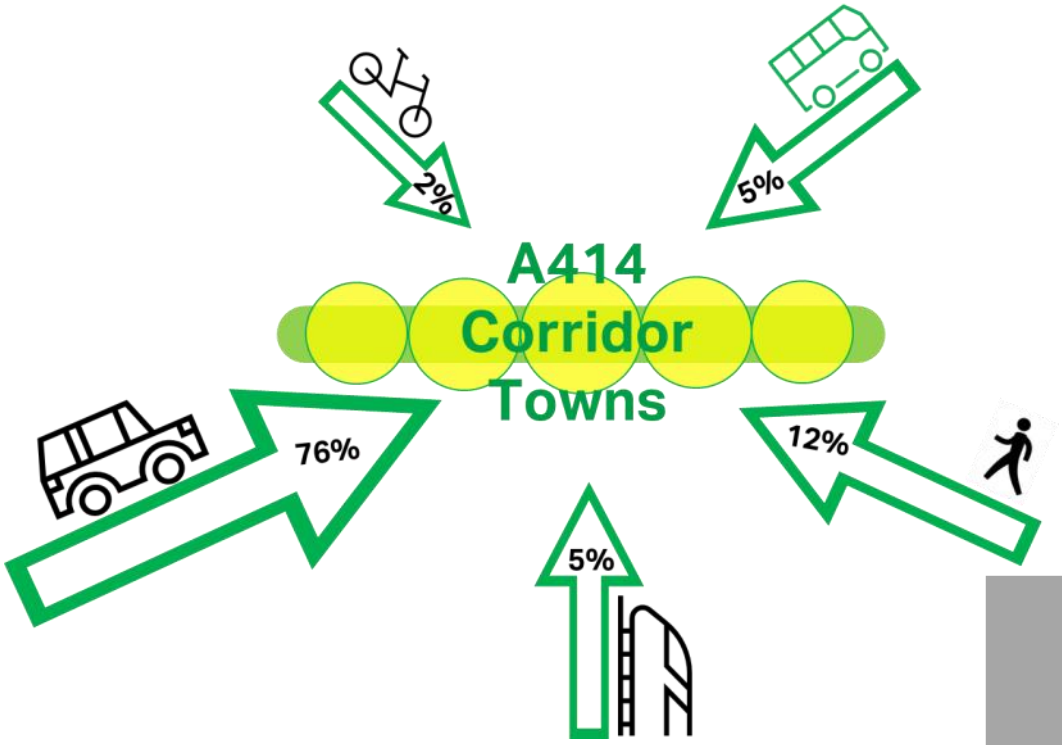
A range of data and evidence sources as well as consultation with stakeholders have been used to identify key growth and transport challenges within the A414 corridor.

More detailed information on the process of gathering and analysing evidence is contained in the Evidence Report.

One of the primary transport evidence tools is Hertfordshire County Council's COMET model which can assess the current and future year performance of the transport network and test different scenarios such as higher or lower housing growth and transport improvements.

The key observations resulting from the evidence review and issue identification exercises are summarised below and presented in this section.

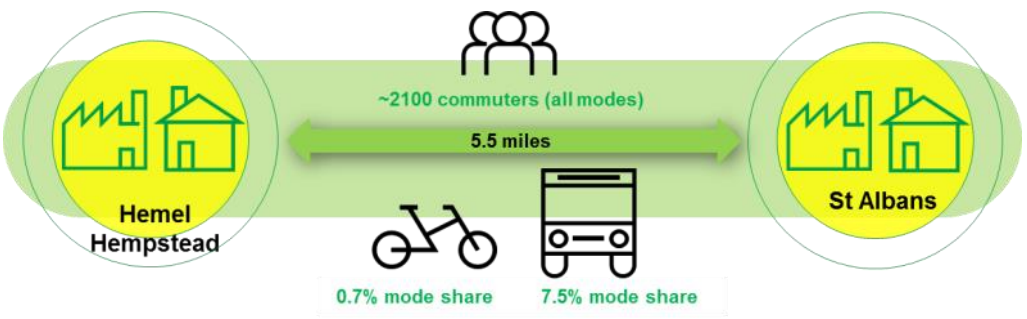
- **Modal Share and Travel Patterns:** Analysis of Census Journey to Work data shows that less than a quarter of commuting trips to towns in the A414 Corridor are made by public transport, by bike and on foot.
- **Highway Congestion:** Current and likely future highway congestion hotspots have been identified based on traffic data and local knowledge of the Corridor's transport network and COMET model outputs.
- **Air Quality:** Several Air Quality Management Areas have been designated within the study area, many as a result of road traffic and located in urban areas. They are likely to experience increases in vehicle volumes over the next 15 years.
- **Cycling Routes:** The cycling network in the corridor is patchy, discontinuous, and there are known issues with the variability in the standard of the facilities which can make it difficult for people to cycle safely and conveniently
- **Public Transport Usage/Accessibility:** Town centres/rail stations and their respective residential areas in the A414 Corridor towns are in general relatively well connected by bus services, although this varies by place and time of day. Inter-urban accessibility, however, is significantly lower e.g. considering a typical journey from a residential part of one town to the centre/employment centre of another.

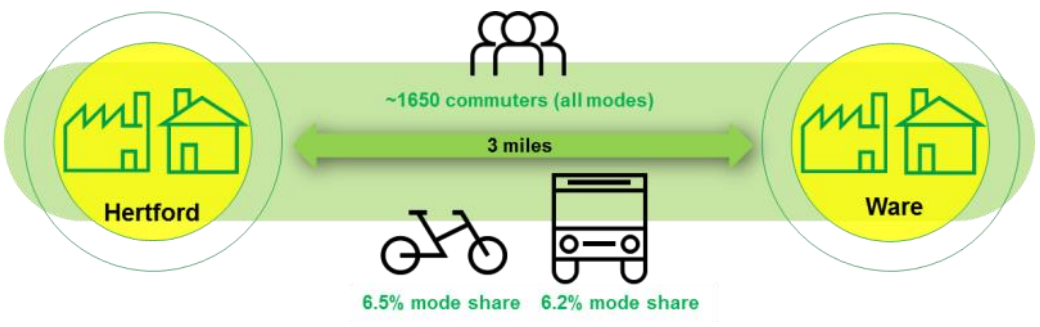


The graphic to the left shows the percentage travel mode share for commuting trips to the towns along the A414 corridor. This shows that around three quarters of all commuting trips are made by car. Walking is also a popular method of travel for shorter distance trips within towns. Trips by bicycle and public transport make up only a small proportion of all commuting trips.

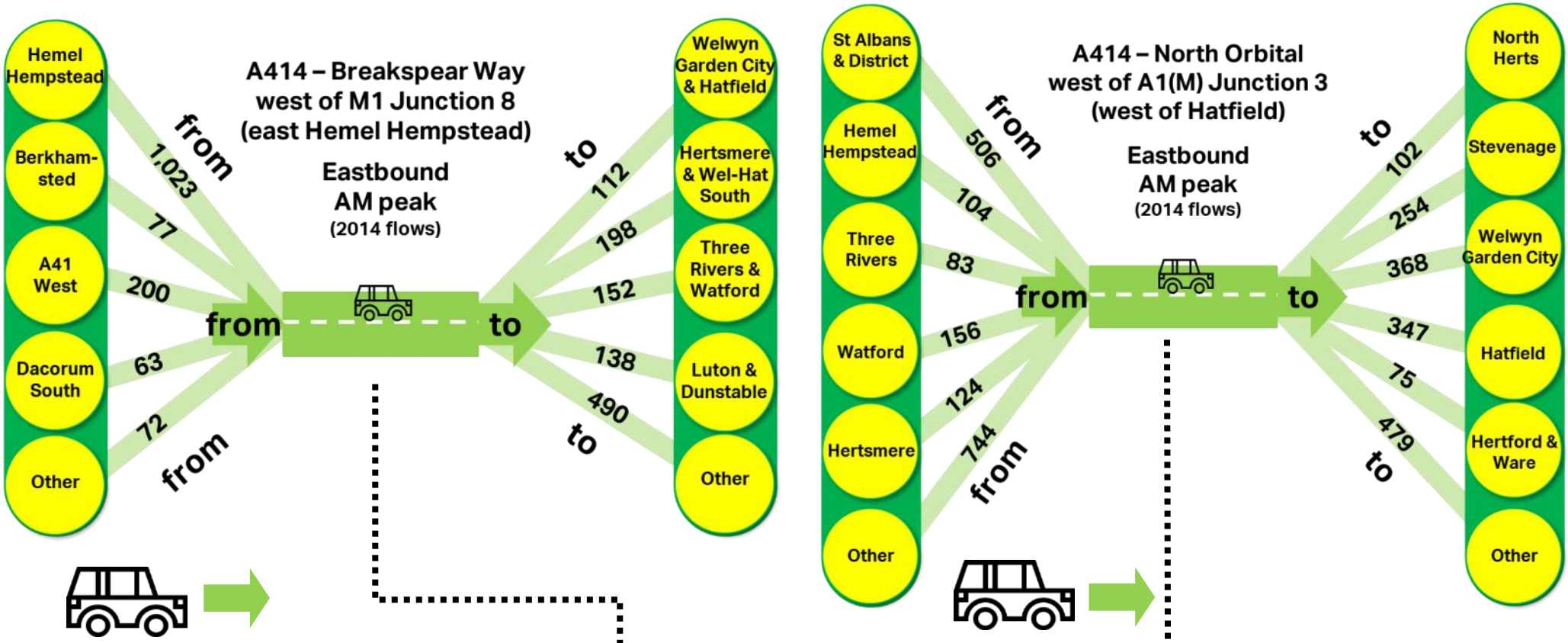
The graphics below show very few trips were made by bicycle or bus between key settlements. Car is the most popular mode of travel between these settlements. The commuting mode share for bicycle is much lower between Hemel Hempstead and St Albans than between Hertford and Ware whereas bus mode share is quite similar. There is a lack of suitable, safe and attractive routes for cyclists between Hemel Hempstead and St Albans.

How people travel through the corridor

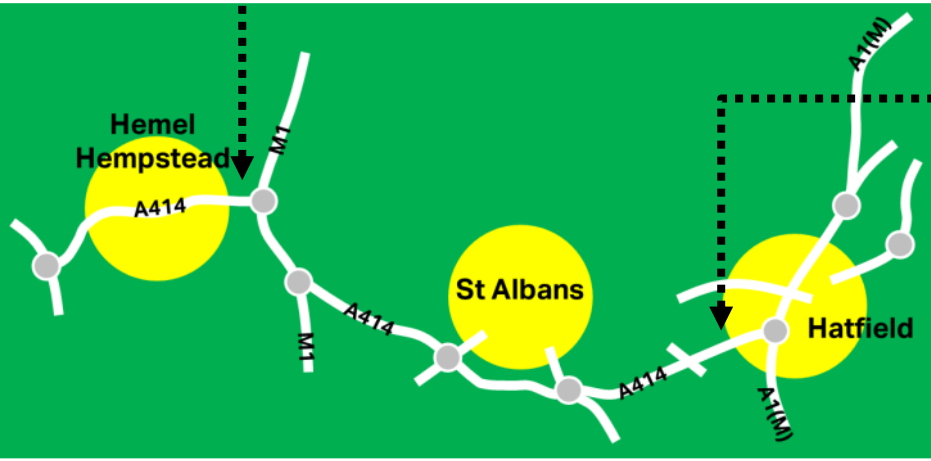




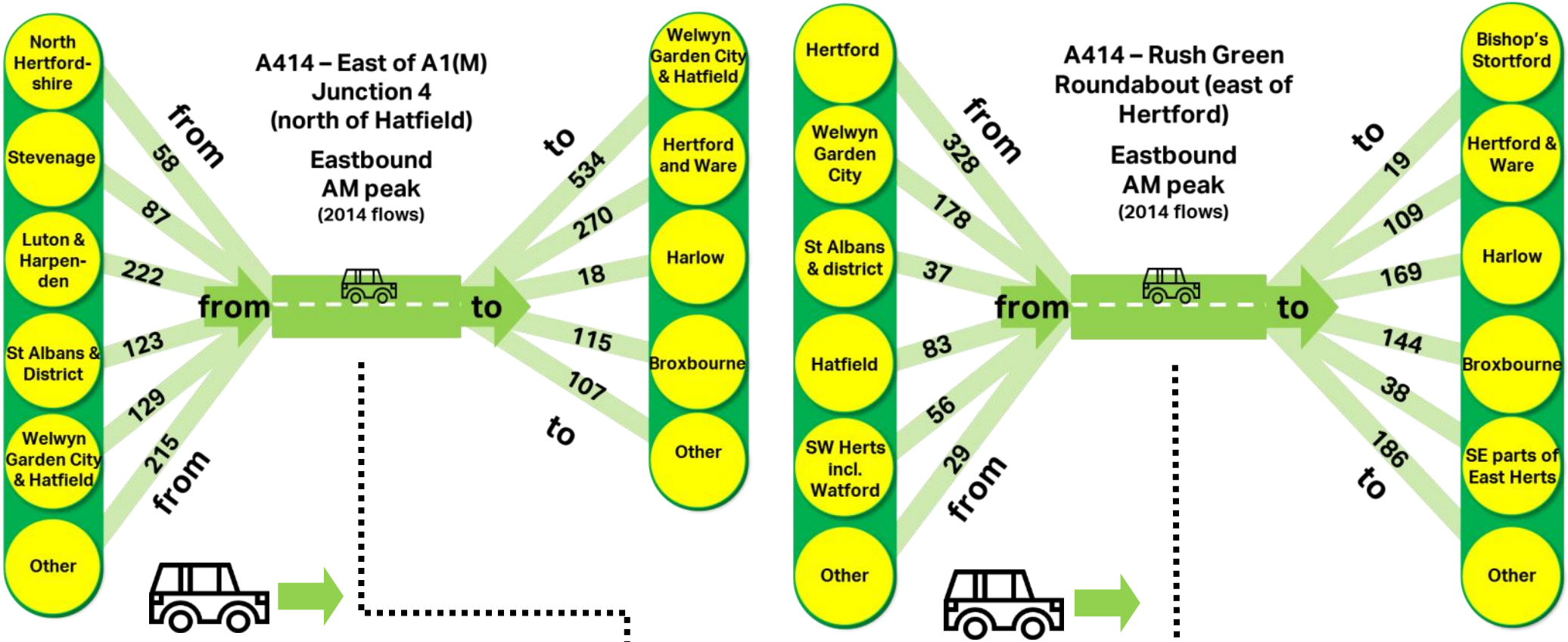
Travel patterns by car on sections of the A414



Most of the traffic approaching the M1 at Junction 8 originates in Hemel Hempstead, although some trips originate from the A41 and therefore route through the town. Trips route toward a wide range of destinations including Hatfield and Welwyn Garden City via the A414



A large proportion of trips approaching A1(M) Junction 3 originate in St Albans including the surrounding district. Many of the trips originate from locations outside of Hertfordshire. Trips route towards a wide range of locations including Hatfield and Welwyn Garden City, but fewer towards Hertford and Harlow.



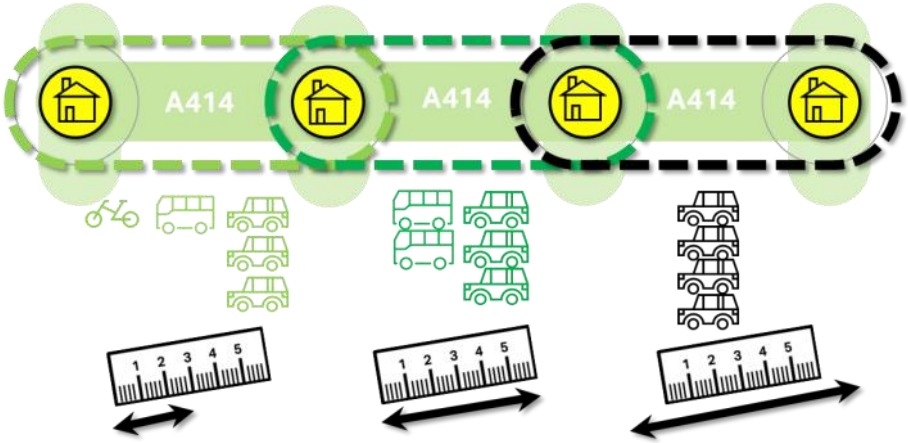
Trips travelling through A1(M) Junction 4 and onto the A414 north of Hatfield come from far and wide including areas along the A1(M) but not a significant number from western and south-western parts of the county. Welwyn Garden City and Hatfield are big destinations as are Hertford and Ware but not many trips are destined east of the A10 e.g. Harlow.

A large proportion of trips on the A414 at Rush Green originate in Hertford, and some also from Welwyn Garden City and Hatfield (fewer from places further west). Trips are destined for a variety of locations including Harlow although a large proportion of trips use the A10 corridor.

The analysis of vehicle travel patterns along sections of the A414 dual carriageway shown on the previous two pages highlight that the route is predominantly used for short to medium distance trips as opposed to longer distance trips from end to end.

However, some sections of the A414 dual carriageway are used more by longer distance trips, for example the section to the south of St Albans between Park Street and Hatfield.

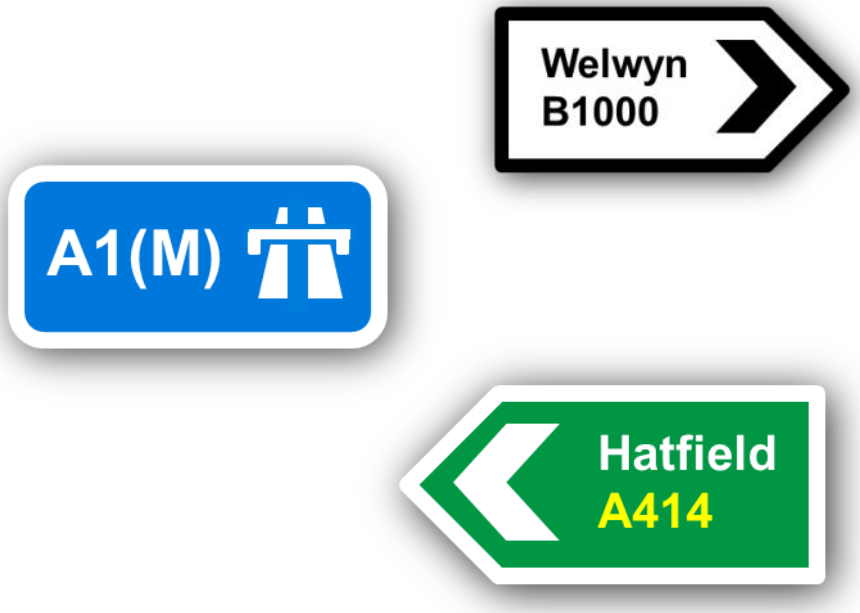
The section of the A414 through Hertford predominantly carries traffic between the A1(M) and A10 but less so to places further west of the A1(M) (e.g. St Albans) and further east of the A10 (e.g. Harlow). The analysis indicates that large volumes of trips using the A414 are destined for Welwyn Garden City and Hatfield with the A1(M) and A10 north-south corridors acting as routes for onward travel.



Other roads in the corridor have a less strategic function and therefore carry more local, shorter distance trips. For example, the A1057 Hatfield Road / St Albans Road West between Hatfield and St Albans performs a less strategic function than the A414, although it does facilitate onward movements to the A1(M) corridor. Similarly, the B1000 linking Welwyn Garden City and Hertford predominately facilitates traffic movements between the two towns but no further.

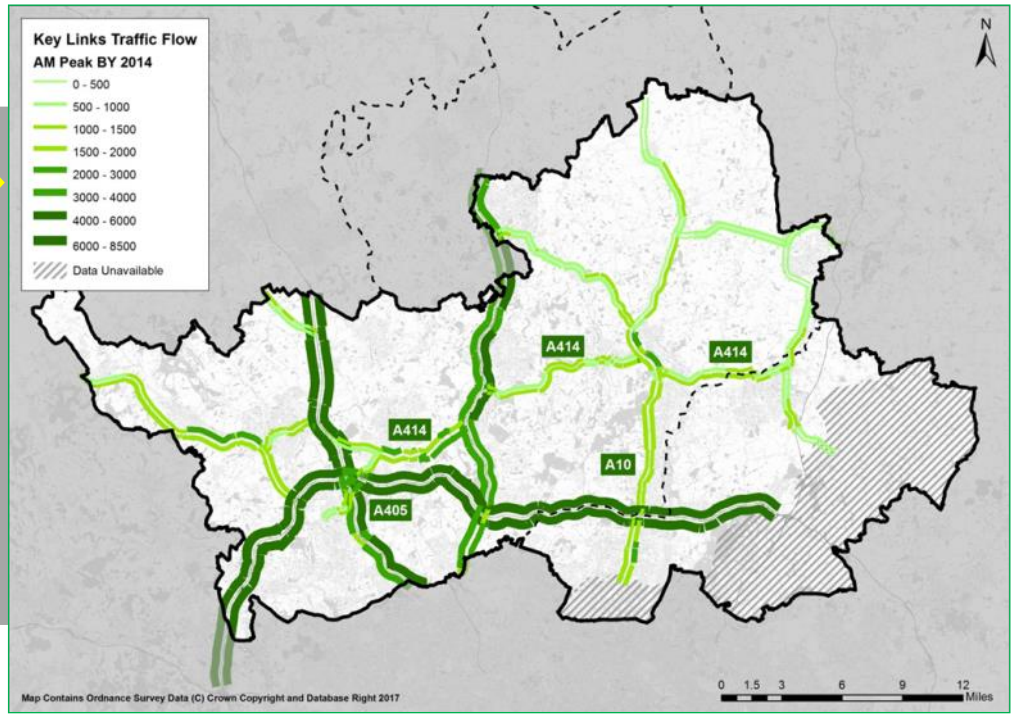
The A405 between Watford and St Albans is also more strategic in nature. The section between M1 Junction 6 and M25 Junction 21a (Bricket Wood) forms part of Highways England's Strategic Road Network and carries longer distance traffic movements as well as shorter distance trips between Watford and St Albans.

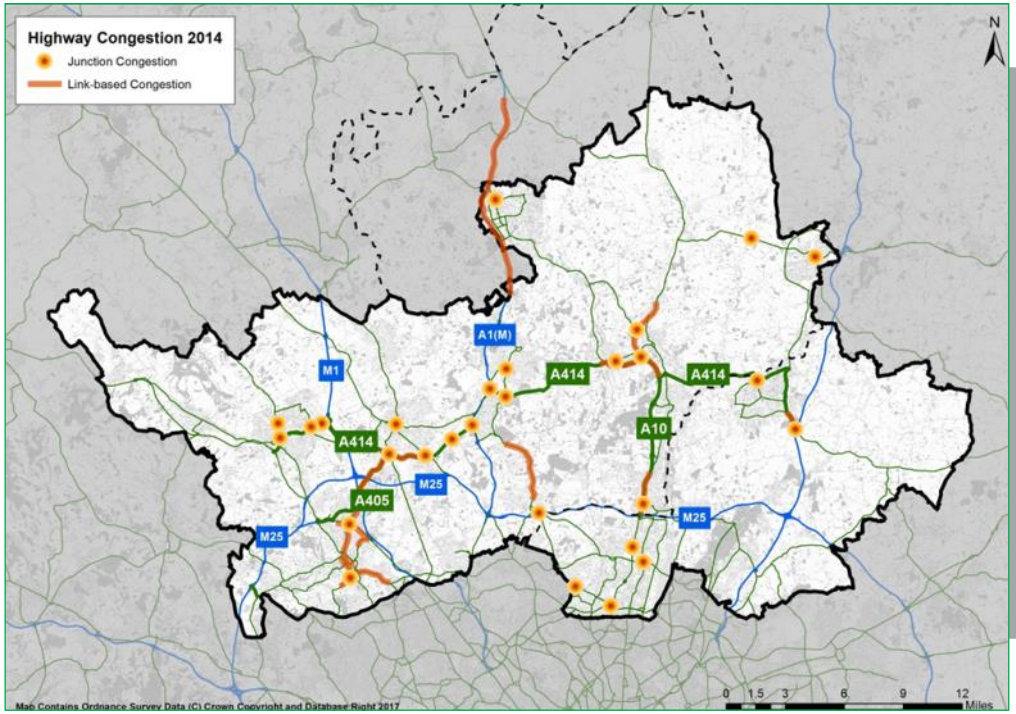
In summary, whilst the Corridor is a major east-west corridor across Hertfordshire, it functions differently along its length which indicates that a 'one size fits all' solution to current and future challenges, such as traffic congestion and a lack of attractive alternatives to the car, will not be appropriate.



Highways Congestion

The graphic to the right shows traffic volumes in 2014 (based on the HCC COMET model) along major roads including the A414. Traffic volumes are influenced by a variety of factors including the capacity of roads, therefore higher volumes of traffic occur on motorways such as the M1, M25 and A1(M) where there are more lanes provided. There are sections of the A414 dual carriageway which experience higher volumes of traffic in particular to the south of St Albans. The A414 also acts as an alternative to the M25 during busy times, providing some network resilience but also increasing local congestion in places like Hertford.





The graphic to the left shows where traffic congestion hotspots typically occur based on 2014 data (presented with yellow and red circles). Locations which experience traffic delays include junctions along the A414 in Hemel Hempstead, at the A414/A405 Park Street Roundabout, A414/A1081 London Colney Roundabout, at A1(M) Junctions 3 and 4 in Hatfield, on A414 junctions in Hertford, and at the A414 Eastwick junction north of Harlow. Therefore, journeys made on any length of the A414 corridor are likely to encounter some delays. Delays also occur on adjoining and local parallel routes, especially within urban areas.

Transport, Place and People

Transport can significantly impact on **people and quality of life**. Effective transport links enable more accessible travel to healthcare, leisure, education and employment – all vital to ensuring people can live successful, healthy and happy lives, and play an active part in society. There are a number of groups in the county at risk of social exclusion if access to education, jobs and key services are provided or are not sufficient enough. Resident surveys indicate there is scope for improvements in local bus service provision, however services to meet access needs are under significant funding pressure. Transport infrastructure such as roads and rail lines can also **limit accessibility by severing communities**, and by acting as a **physical barrier to walking and cycling**.

Within the A414 corridor, major roads which are heavily trafficked can dissect communities. In Hemel Hempstead and Hertford for example the A414 dual carriageway runs through the middle of the towns, putting the needs of motorists ahead of the needs of local people who need access to local shops and key services. In some instances, there is **limited or less attractive provision for pedestrians and cyclists to cross these busy roads**.

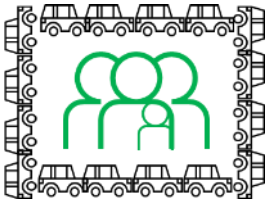
Noise, traffic congestion and pollution can have a serious detrimental effect on the lives of people who live alongside or close to these busy roads.

Key issues which can affect the quality and vitality of urban centres include **high levels of car use and congestion** resulting in **excessive noise, poorer air quality, aesthetics, and negative impacts on the historic and natural environment.** High levels of car use can limit the potential to improve provision for other modes of travel, such as walking and cycling, which may enhance the sense of place.

The quality of local transport links and environment can also be a factor in **levels of physical activity**, with implications for **people's health and wellbeing**. As with other parts of England, there are high levels of obesity among the population of Hertfordshire, with a lack of physical activity being a significant factor. Increasing levels of active travel can contribute to healthier weight, but also reduce the risk of a number of major diseases. There is potential to increase rates of physical activity in all parts of the corridor and increasing rates of walking and cycling can be a way to help achieve this. It could also play a role in addressing health inequalities given some of the districts with the lowest rates of walking and cycling activity also contain some of the county's more deprived areas.

Socio-economic inequalities, housing affordability and health

In Hertfordshire approximately 80% of working age residents are in employment, which is above the national average, and unemployment is at its lowest rate for ten years. However, there are parts of Hertfordshire that have high levels of socio-economic deprivation, particularly in the more densely populated areas such as parts of Watford, Hemel Hempstead, Hatfield and Broxbourne.



Transport can play a role in **supporting access to employment, education and training**, but also in tackling other issues present in some deprived communities such as poorer health outcomes and lower quality environments. Poor access to services can be a factor in **social exclusion**. Transport provision, the location and manner in which services are provided (e.g. hours of operation or whether services can be accessed remotely) can all contribute significantly.

Hertfordshire's appeal as a good place to live and work, and its growth constraints are factors in it being one of the most expensive places to buy a property outside London. This means many people cannot afford to live in Hertfordshire and are forced to commute into the county from surrounding areas. This in turn places pressure on primary, inter-urban routes such as the A414 and mainline railways.

As with many parts of the country there is **significant opportunity for improvement in the health of Hertfordshire's population**. Raising levels of active travel can make a significant contribution to raising levels of physical activity and overall health and wellbeing.

One of the most direct impacts on health by transport is through lives lost and life limiting conditions caused by **road collisions** and **poor air quality**. There is evidence to suggest that the premature deaths (40-50,000 per year in the UK) caused by poor air quality in the UK dwarfs the number of deaths caused by road casualties (1,732 in 2015 in Great Britain) and public awareness of poor air quality, its impacts and the contribution of transport to this has grown in recent years.

Several **Air Quality Management Areas** are designated along the A414, including two in Hemel Hempstead, three in St Albans and one in Hertford as well as on the A10 in Cheshunt and A405 in northern Watford.

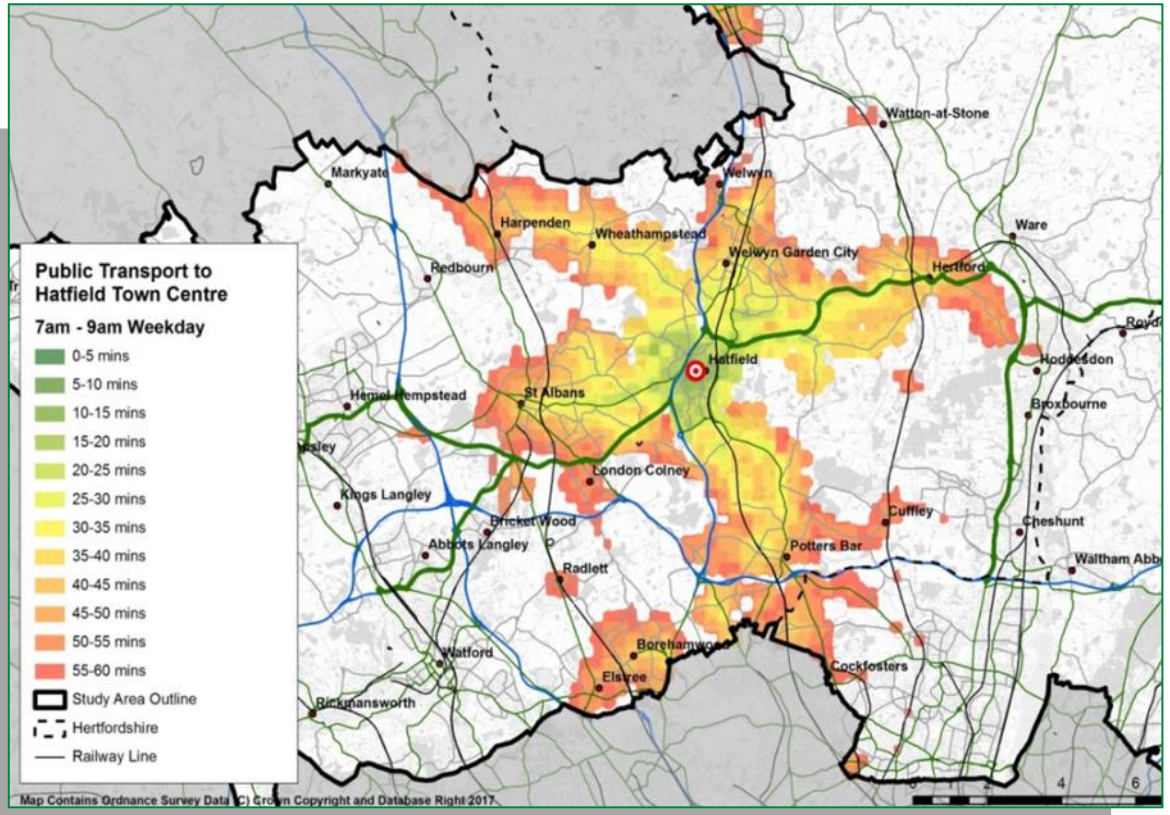
Cycle Routes

There are notable gaps in the provision of safe, attractive and continuous cycle routes between key towns along the corridor (see the figure to the right). Commuting patterns indicates that a significant number of commuters travel between these towns, currently predominantly by private car). It is likely, therefore, that the available cycling facilities are insufficient to encourage modal shift between and within these towns despite in some cases the distances being quite short.

Hemel Hempstead (north of A414) < > Hemel Hempstead (south of A414)
Hemel Hempstead < > St Albans
Watford < > St Albans
St Albans < > Welwyn Garden City
Hatfield < > Hertford
Hertford < > Broxbourne Towns

Public Transport Accessibility and Reliability

The level of public transport accessibility based on journey time varies across the corridor. Towns are typically well connected by bus to the adjacent town. The graphic to the right shows the level of accessibility by public transport to Hatfield town centre. Areas shaded orange-to-red have poorer levels of accessibility where journeys by public transport are longer, and areas shaded green have better levels of accessibility. Hatfield is relatively well connected to the adjacent settlements of St Albans and Welwyn Garden City, but less well to locations further along the corridor such as Watford, Hemel Hempstead and the Broxbourne towns. Hatfield is a major employment centre with the business park being of county-significance and is home to the university. This indicates that the private car may be the only means of accessing Hatfield from some parts of the corridor within an attractive journey time over the distance travelled.

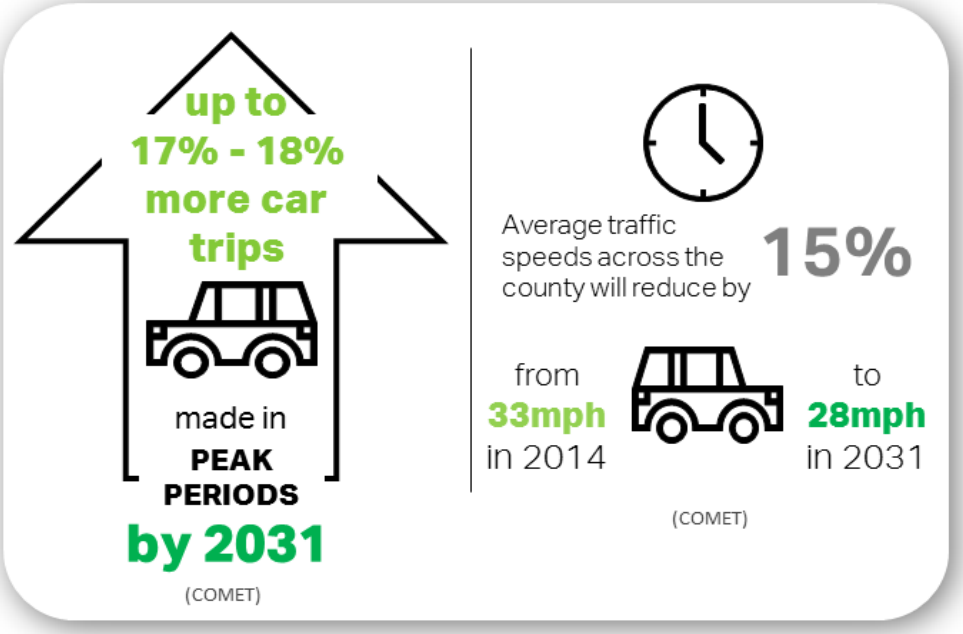


Some bus services within the A414 corridor experience delays. Whilst bus operators endeavour to take account of congestion and reflect this in timetables, the lack of resilience in the highway network can lead to service delays. For example, the 724 Greenline service spans the entire corridor between Harlow and Watford (and beyond) and it passes through many towns along very busy sections of highway. Delays to services can therefore occur especially during busy peak periods, and these delays can accumulate across the entire route. Such delays can reduce the attractiveness of bus travel, and must be taken into account alongside other factors such as access to the Public Transport network, fares, frequency and hours of operation in planning future bus service provision.

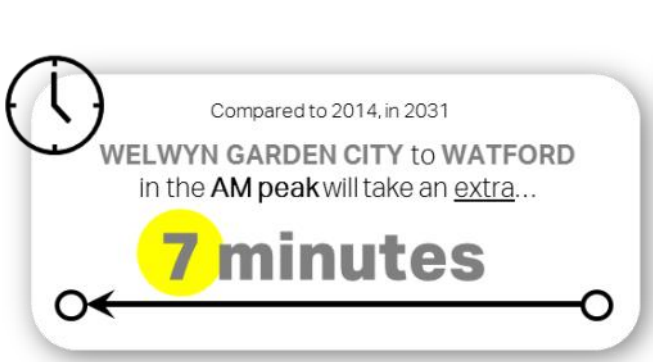
What will growth mean for transport in the corridor?

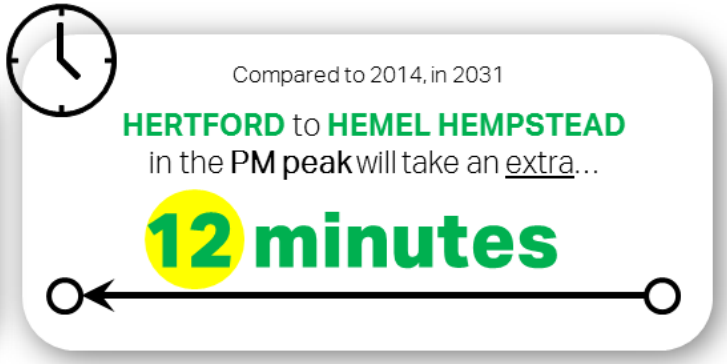
Increased travel demand generated by population and economic growth is forecast to increase peak period car trips by 17-18% by 2031 across Hertfordshire. This will lead to peak spreading (people travelling at different times of the day to avoid the worst congestion). Travel times during the AM peak are predicted to increase by 50% with a 15% reduction in average traffic speed.

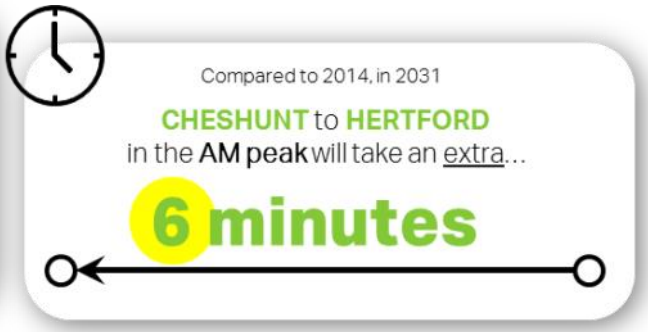
The statistics at the bottom of this page are taken from the county council's transport model (COMET) which assumes current travel behaviour continues into the future. It estimates significant increases in journey times between key towns within the A414 corridor. The model indicates a significant amount of suppressed travel demand, particularly in the AM peak, where demand cannot be accommodated on the transport network resulting in trips being made at different times of the day (increasing congestion in other time periods) or not at all.

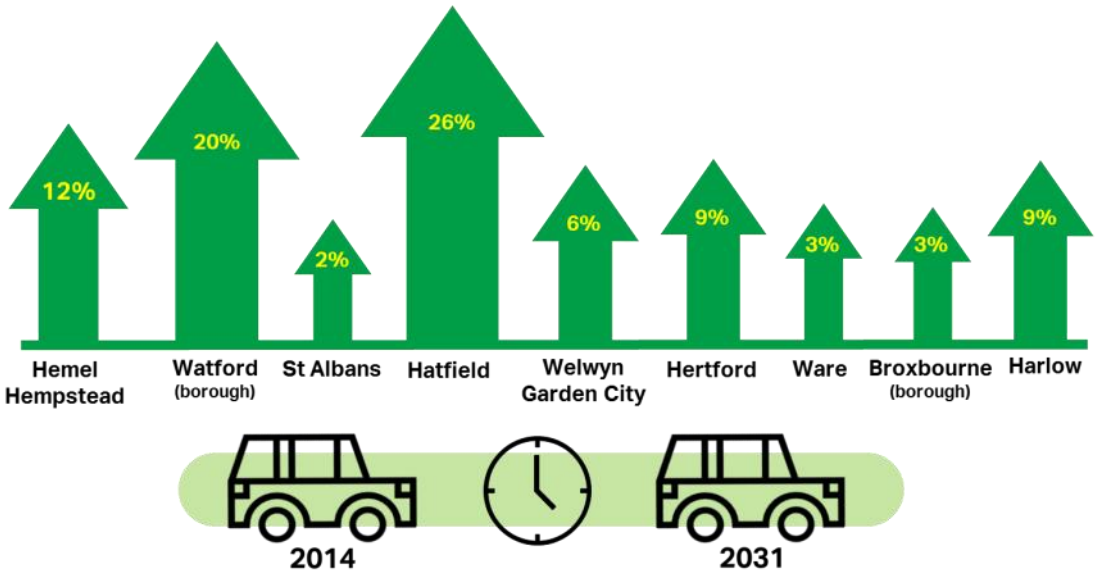


The forecast suggests a transport strategy solely focused on catering for increased traffic demand would be at best very expensive, difficult to deliver, environmentally damaging and result in traffic congestion simply being displaced to other parts of the network including residential streets and country lanes. At worst such an approach could be largely ineffective as any extra highway capacity created would be filled by traffic.





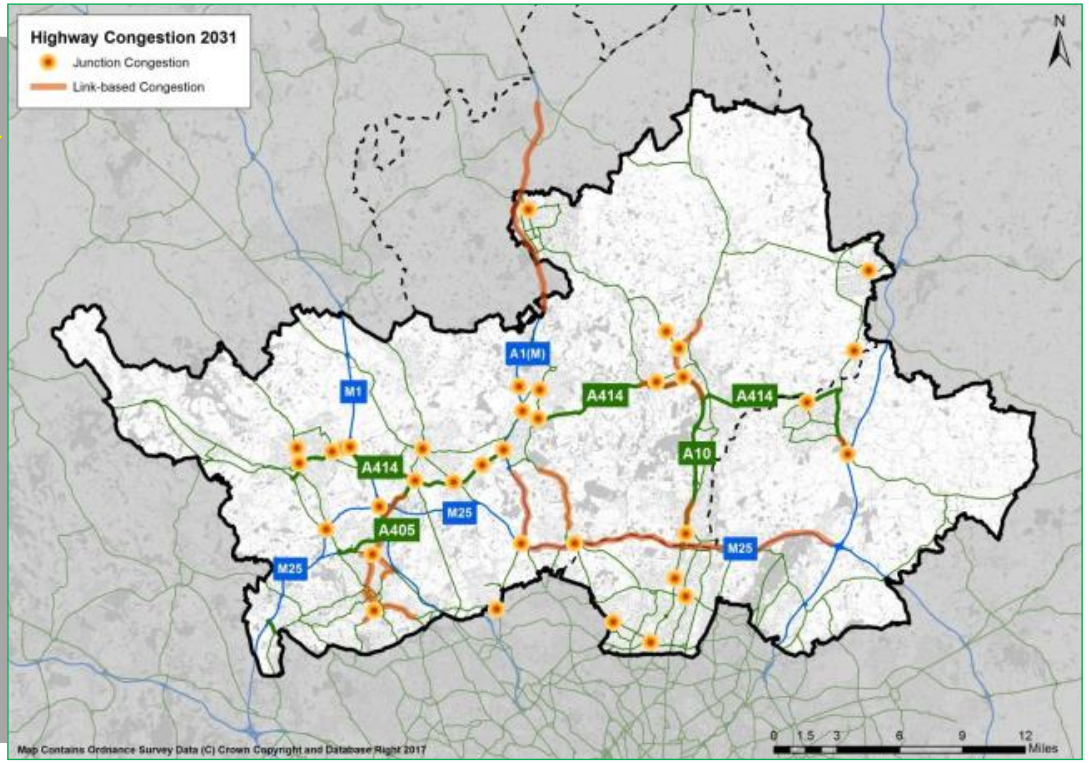




Analysis of modelled intra-urban vehicle trips (i.e. trips starting and ending in the same town) in HCC's COMET model shows that there is a predicted increase in journey times as a result of rising congestion. The towns with the largest predicted increases in journey time between 2014 and 2031 are Hatfield and Watford. What might appear to be relatively modest increases in journeys in places such as St Albans may be attributable to existing levels of traffic congestion that can act as a constraint on any additional delay that can occur in the future.

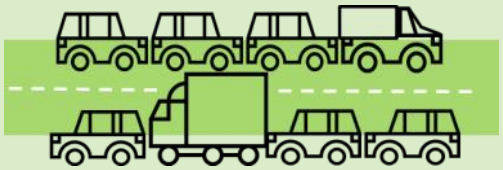
The figure to the right shows the predicted highway congestion hotspots in 2031 according to forecasts provided by HCC's COMET model. Congestion is occurring either at key junctions (as shown by the yellow and red circles) or along carriageway links (as shown by the shaded red lines). In comparison to a modelled base year of 2014, the following hotspots show notable increases in junction or carriageway link-based delay by 2031:

- Junctions on the A414 through Hemel Hempstead
- A414/A1081 London Colney Roundabout
- A1(M) Junctions 3 and 4 (Hatfield)
- Junctions on the A414 through Hertford



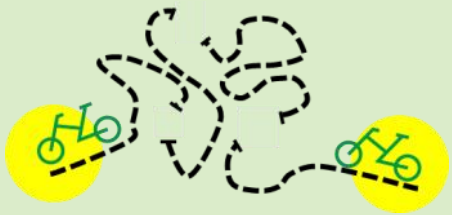
A summary of key challenges

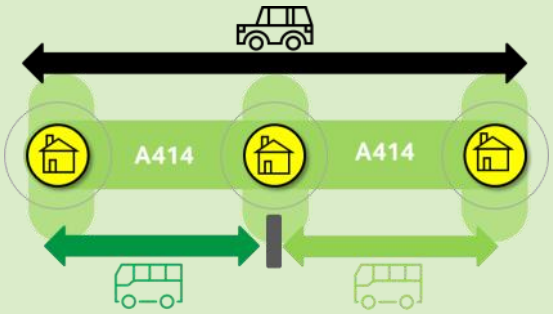
The analysis briefly summarised in this report and discussed in more detail in the accompanying Evidence Report highlights the key challenges which the A414 Corridor Strategy seeks to address. These challenges need to be considered in the context of planned future housing and employment growth as summarised in the previous chapter. Where the challenges today may be considered an irritant to users of the transport network, or already at a severe level having a more significant effect on people's day-to-day activities, the additional homes and jobs will place even greater pressure on the transport network.



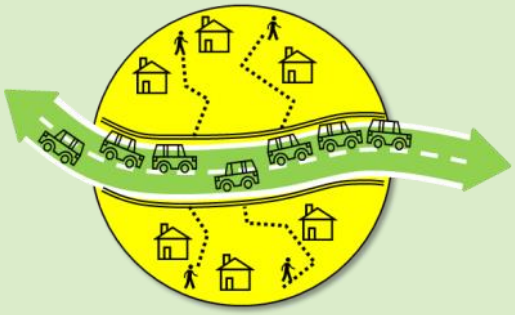
Traffic congestion is already severe on key carriageway links and at junctions including the A414 Breakspear Way (Hemel Hempstead), M1 Junction 8, A414/A405 Park Street Roundabout, M25 Junction 21a (Bricket Wood), A414/A1081 London Colney Roundabout, A1M Junctions 3 and 4, A414 junctions in Hertford and A10 junctions in Broxbourne. At many of these locations, congestion is predicted to increase further in the future which will lead to longer journey times and more trips diverting onto less suitable roads for example through residential areas and quite rural villages.

There is poor connectivity for cyclists between and within key urban settlements, therefore cycling is not always a safe and attractive alternative to the car for short and some medium distance trips within the corridor. Key gaps along routes or where existing facilities are poor include Hemel Hempstead-St Albans, Park Street-London-Colney-Hatfield and within Hertford and Hemel Hempstead.





There is poor public transport connectivity along the corridor which could offer an alternative to the private car for medium to longer distance trips within the A414 corridor. Travelling by bus is most likely to require interchanging between services. Some services experience delays and reliability issues due to traffic congestion. Some services are less frequent and journey times are much longer than those by car. Most trips by train within the corridor require a trip via London.



Heavily trafficked roads disconnect communities and make access to urban centres and key services more difficult, especially where facilities for pedestrians and cyclists are more limited or perceived to be poor in quality. The dominance of traffic in urban settlements can have a negative effect on sense of place and can impact town centres, making them less attractive to visit and spend time and money. Hertford and Hemel Hempstead are two examples where the A414 dual carriageway dissects the towns. There can also be a detrimental effect on people's health and wellbeing.

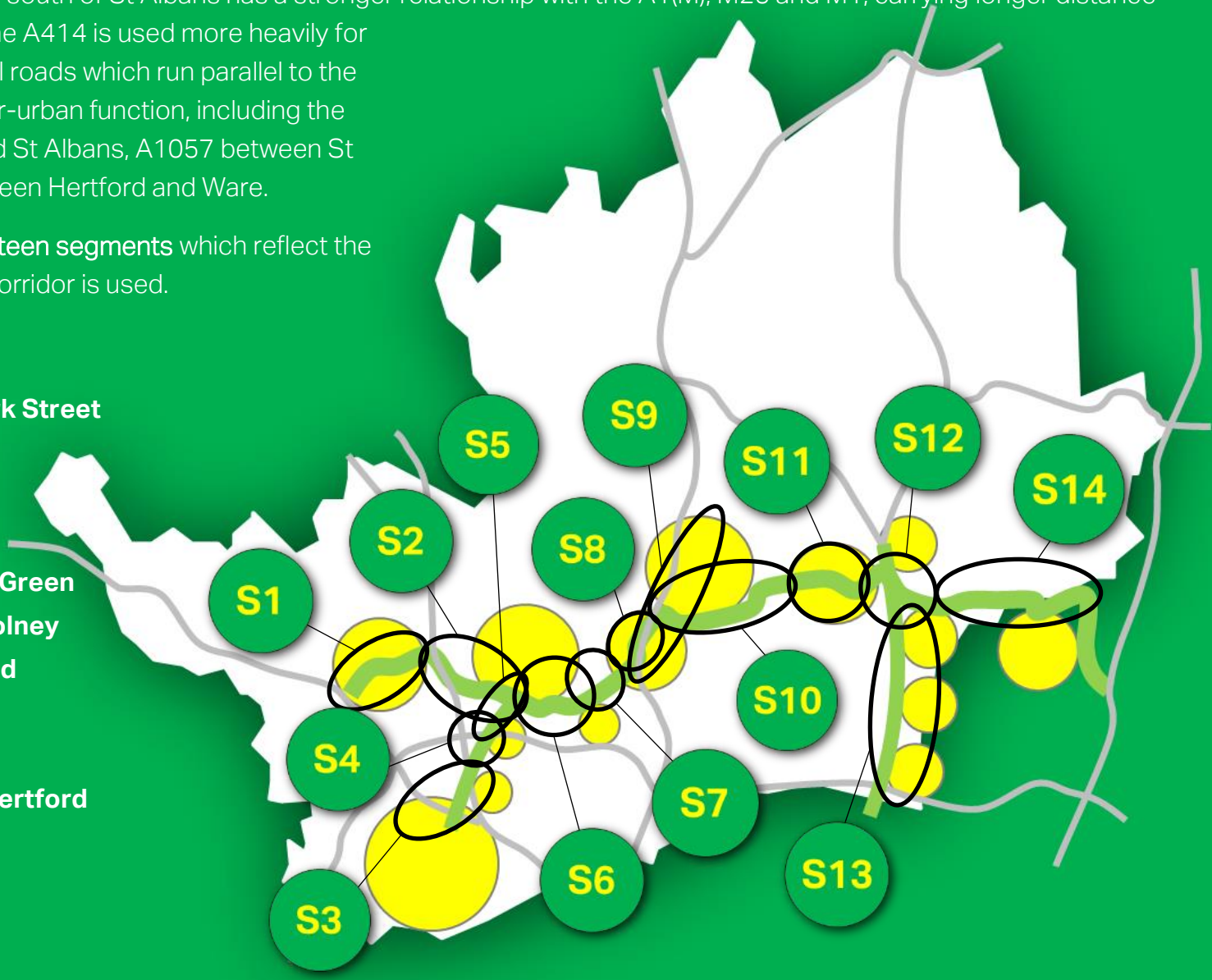
Corridor Segments

The evidence review undertaken for this strategy demonstrates that the A414 Corridor is not consistent in terms of its characteristics and how it is used. For example, the section south of St Albans has a stronger relationship with the A1(M), M25 and M1, carrying longer distance traffic. By contrast, east of the A1(M), the A414 is used more heavily for shorter distance trips. Some more local roads which run parallel to the A414 main road have an important inter-urban function, including the A4147 between Hemel Hempstead and St Albans, A1057 between St Albans and Hatfield and the A119 between Hertford and Ware.

The corridor has been divided into fourteen segments which reflect the variety of travel patterns and how the corridor is used.

S1 Hemel Hempstead
S2 Hemel Hempstead-St Albans-Park Street
S3 Watford-Garston
S4 Bricket Wood Triangle

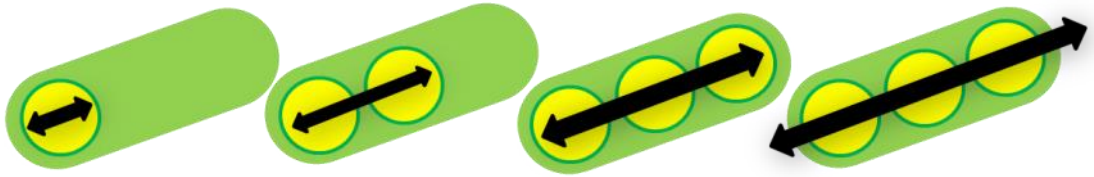
S5 Park Street-How Wood-Chiswell Green
S6 Park Street-St Albans-London Colney
S7 St Albans-London Colney-Hatfield
S8 Hatfield
S9 Welwyn Garden City-Hatfield
S10 Hatfield-Welwyn Garden City-Hertford
S11 Hertford
S12 Hertford-Rush Green
S13 Broxbourne Towns
S14 A10-Harlow



How the corridor is used

The various segments of the corridor display different characteristics in terms of the type of journeys made on them. Some segments are used more for longer distance trips using strategic transport links such as motorways and major roads such as the A414 or A10. Other segments also serve short distance journeys within towns.

HCC's COMET model has been used to determine how the various segments of the corridor function in terms of dominant or significant transport movements that may contribute to highway congestion and delays.



Corridor Segment	**Local:** movements within towns	**Local Strategic:** movements between towns within the corridor	**Corridor Strategic:** movements on the strategic transport network originating/ending in corridor area	**External Strategic:** through-trips on the strategic transport network
S1 | Hemel Hempstead	✔	✔	✔	
S2 | Hemel Hempstead-Park St		✔	✔	✔
S3 | Watford-Garston		✔	✔	
S4 | Bricket Wood Triangle		✔	✔	✔
S5 | Park Street-How Wood-Chiswell Green		✔	✔	✔
S6 | Park Street-St Albans-London Colney		✔	✔	✔
S7 | St Albans-London Colney-Hatfield		✔	✔	✔
S8 | Hatfield (A1M)			✔	✔
S9 | Welwyn Garden City-Hatfield	✔	✔	✔	
S10 | Hatfield-Welwyn Garden City-Hertford		✔	✔	
S11 | Hertford	✔	✔	✔	
S12 | Hertford-Rush Green	✔	✔	✔	
S13 | Broxbourne Towns		✔	✔	✔
S14 | A10 - Harlow		✔	✔	✔

6 | Objectives

Eleven objectives have guided the development of the Corridor Strategy. These objectives have taken into account the key challenges discussed in the previous section. The objectives align with the objectives contained in the county council's Local Transport Plan 4 and with principles and objectives set out in local planning authorities' Local Plans. In order to evaluate whether or not, and to what extent, the A414 Corridor Strategy meets its objectives, each package of proposals will be delivered against defined monitoring principles, drawing on the monitoring framework of the LTP4. This process will be set out under the separate A414 Corridor Strategy Implementation Plan.

The eleven objectives are described as follows.

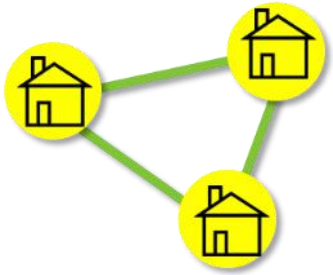
Support sustainable economic growth

This objective is about how the transport network can support the creation of new jobs by enabling people to get to and from work and for businesses to move goods and services.

A significant number of new jobs are proposed across the A414 corridor. The Hertfordshire IQ Enterprise Zone at Maylands is one location where thousands of new jobs are proposed. The additional jobs will generate movements by different methods of travel across the corridor including by car and by bus.

The aim of this objective is to ensure that this economic growth can come forward in a sustainable way including provision being made for journeys by public transport, on foot and by bicycle.

Improve inter-urban connectivity



This objective is about providing better transport links between towns.

The A414 corridor is used for a variety of purposes, for example people travelling to/from work, visiting family and friends, or for transporting goods, and by different methods of travel for example bus, car, by HGV, on foot or by bike. However, the level of connectivity (for example, how frequent bus services run throughout the day) is not the same along the corridor and there are locations where there are fewer transport choices which will disadvantage some groups of people including the elderly.

The aim of this objective is to identify improvements to the transport connections between places by different travel modes, including more choices wanting or needing to travel by public transport.

Define an appropriate route hierarchy

This objective is about recognising the differences between routes and the types of journeys these routes are used for, for example lorries carrying goods over longer distances and parents taking their children to school.

The A414 corridor comprises a network of different highway links. Some links are designed to allow more cars and lorries to travel at higher speeds, whereas other links provide better facilities for pedestrians and cyclists.

The aim of this objective is to consider if the network is being used efficiently, for example discouraging traffic from rat-running along quieter residential streets and narrow country lanes and instead ensuring they remain on the main roads. The aim is also about identifying where certain users of the transport network should be given greater priority to better serve their needs, to ensure that the right priority is given to the right user in the right place.

Improve operation, resilience and reliability of the transport network

This objective is about making sure the transport network works with less disruption so that people feel confident they will get to their destination on time by any mode of transport.

The A414 corridor already experiences significant levels of traffic congestion today. With planned additional homes and jobs, levels of congestion could increase further and motorists may seek alternative and less appropriate routes so that their journey time is not affected. These alternative routes may pass schools and quiet villages.

The aim of this objective is to improve the operation of the corridor which can include improving some highway junctions, making more efficient use of existing infrastructure and improving alternatives to the car for example public transport services.

Enhance sense of place and town centre viability

This objective is about recognising that the A414 corridor is not just moving people between and through towns, but also that people live, work and want to spend time at places including town centres along the corridor.

There are many settlements along the corridor, including the principal towns of Watford, Hemel Hempstead, St

Albans, Hatfield, Welwyn Garden City, Hertford, the Broxbourne Towns and Harlow, as well as smaller communities including Bricket Wood, Park Street, London Colney and Ware. Transport can have a significant effect on place, both negative and positive: busy roads can divide communities; traffic congestion and infrequent bus services can discourage people from travelling to their local town centre. Well designed roads with attractive landscaping and high quality materials can however enhance a distinctive sense of place while enhancing the built, historic and natural environments.

The aim of this objective is to ensure there are opportunities to enhance places and contribute towards the viability and vitality of town centres through transport proposals.

Enable and facilitate modal shift to active travel

This objective is about making improvements to footways and cycle routes that will encourage people to make more shorter distance journeys on foot and by bike instead of travelling by car.

Much of the A414 corridor is focused towards the needs of motorists. People can make quite short journeys within and between towns by car because it is viewed as being more convenient or the alternatives are considered to be less attractive.

The aim of this objective is to enhance infrastructure and routes for pedestrians and cyclists in order to make travelling on foot or by bike a much more attractive alternative to the car, especially for shorter distance trips within towns.

Enable and facilitate modal shift to public transport

This objective is about making improvements to public transport services and key facilities such as stations and stops, that will encourage people to make more journeys by bus or train instead of travelling by car.

There are limited public transport alternatives to the private car within the A414 corridor, especially for journeys between towns and along the entire length of the corridor. For instance, there is only one continuous bus service operating hourly between Watford and Harlow. There are numerous local bus services linking towns, however these services vary in frequency and not all connect to key locations such as business parks and railway stations, so they are not convenient for everyone.

The aim of this objective is to improve public transport options within the corridor, in particular facilitating faster, more reliable and comfortable journeys by local bus or by more innovative passenger transport modes.

Implement demand management to support efficient use of the network and enable behaviour change

This objective is about making better use of existing roads and encourage people not to make unnecessary journeys.

There is currently great potential for people to shift from travelling by car to alternative, more sustainable modes of travel in the county and existing travel behaviour (i.e. the choices people make about how they travel) represents an inefficient use of the space that is available on roads.

Around half of the commuters in local towns including Watford, Hemel Hempstead, Welwyn Garden City, St Albans and Cheshunt, who live in the same town in which they work, travel by car. This means they could be travelling quite short distances and could instead travel on foot, by bike or on a bus. Additionally there is a lot of short distance inter-urban commuter travel between towns in Hertfordshire, which is not an efficient use of the transport network. These trips could transfer to rail, bus or car share.

The aim of this objective is to encourage behaviour change, reallocate road space from general traffic to more sustainable modes, discourage unnecessary car trips and encourage people to work from home. This objective draws on Hertfordshire's LTP4, which includes specific policies relating to demand management and behaviour change.

Incorporate the benefits of new technology to support efficient use of the network and enable behaviour change

This objective is about recognising that new technology will affect how people travel and could help the transport network work better for everyone.

People who use the transport network are increasingly reliant upon different forms of technology to make journeys, including satellite navigation in vehicles to make informed routing decisions and buying public transport tickets on their mobile phones. Technology can play a significant role in managing the transport network, including the operation of traffic signals and is set to play an even greater role in the future.

The aim of this objective is to recognise the important role of technology and use it as an opportunity to support a more efficient use of the existing network as well as enabling people to make more informed decisions about their journeys.

Ensure safe and secure travel

This objective is about making sure people who travel along the A414 corridor feel safe and secure.

The safety and security of different groups of people on the transport network is of the upmost importance and this includes minimising the risk of collisions and injuries occurring on roads and increasing the feeling of safety and security at bus stops for example.

The aim of this objective is to ensure journeys within the A414 corridor can be made safely and securely by all user groups, including vulnerable users such as pedestrians, cyclists, powered two wheelers and public transport users.

Deliver better environmental outcomes

This objective is about recognising the importance of the natural environment and how it could be affected by transport.

Transport and associated infrastructure can have a significant effect on the environment, including impacts on noise volumes, air quality, biodiversity and surface run-off which can lead to flooding. Conversely, transport can provide the opportunity to improve the environment if infrastructure is designed well and sympathetically to suit its surroundings.

The aim of this objective is to ensure that the environment within the A414 corridor is not adversely impacted by proposed interventions, and that there could be opportunities to enhance the environment as a consequence of proposals.

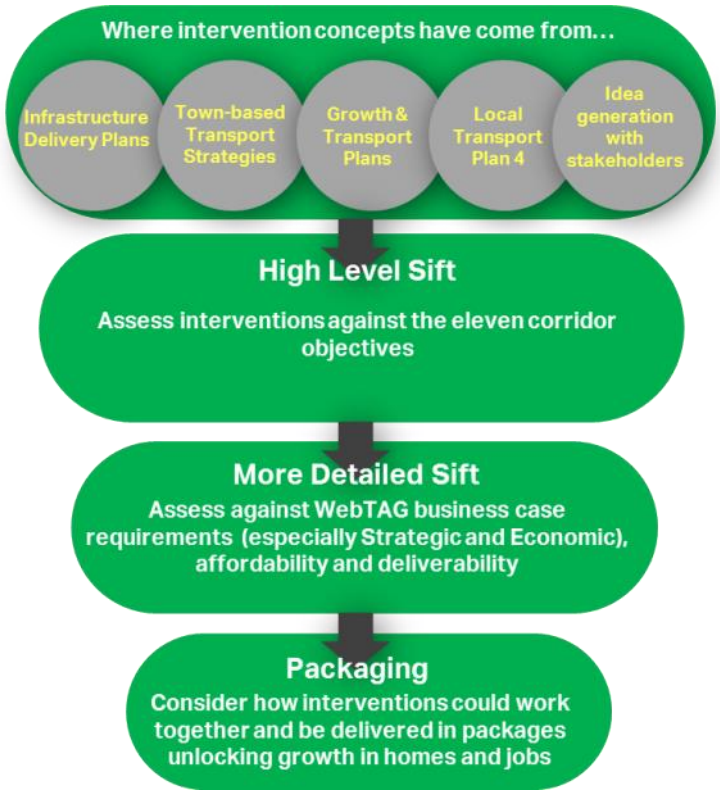
7.1 Proposals Overview

It is essential for the A414 Corridor Strategy to align with other strategies and plans in the area. To identify appropriate interventions which address the growth and transport challenges along the corridor, a logical starting point is to make reference to the local planning authorities' Infrastructure Delivery Plans which set out the key infrastructure required to deliver the levels of housing and employment growth proposed in their Local Plans.

Reference has been made to town-based transport strategies, specifically the Broxbourne; Hatfield; and Harlow Gilston Transport Strategies.

At a larger geographical level, reference has been made to the Local Transport Plan 4 which identifies strategic transport interventions; and the emerging Growth and Transport Plans.

Finally, there has been a process of idea generation in discussion with key stakeholders, seeking their views on appropriate solutions to the corridor's growth and transport challenges. This has resulted in an exhaustive list of interventions, not all aligned with the corridor objectives. A process has therefore been undertaken to sift the long list down to those interventions considered most essential to deliver the Corridor objectives, with the sifting process broadly based on industry and Department for Transport guidance ('WebTAG') and best practice. The analysis considered how the network serves 'place' (residential, retail, leisure etc.) and 'movement' (e.g. local or strategic traffic) functions.



The interventions put forward in the Corridor Strategy are based on current evidence and may be subject to change at a future point in time. Reference should be made to Infrastructure Delivery Plans (IDPs) for a more up to date record of planned interventions and to the Rights of Way (ROW) Improvement Plan for a complete record of all ROW proposals.

Considering the **place** and **movement** functions of the highway

Hertfordshire's highway network includes a wide variety of different types of roads with different purposes, each carrying different levels of traffic, with different standards of provision for different users of the network and different surrounding land uses which influence how roads are used.

With significant planned levels of housing and employment growth coming forward, the network faces a complex set of challenges in accommodating additional movements between places and along links. Many roads already experience significant levels of traffic congestion, and this can have negative implications on surrounding communities. If congestion levels continue to increase, this may force people to find alternative and less suitable routes which can have negative impacts on communities.

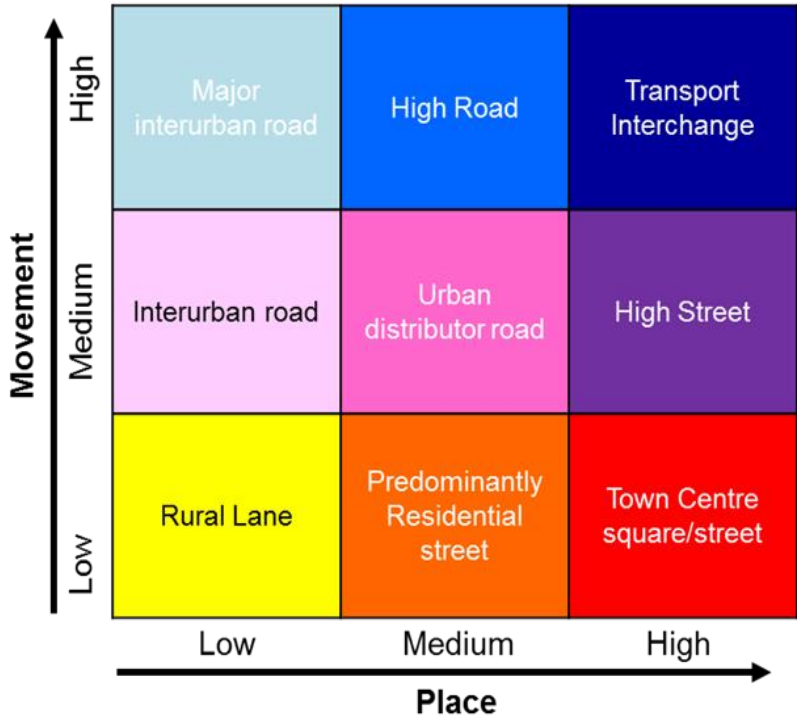
Defining the intended function of highway links can help to inform the process of reviewing the appropriateness of proposed infrastructure interventions and identify alternative interventions which can reinforce intended functions or seek to reprioritise routes so that they better serve the needs of local communities.

The purpose of defining the network hierarchy is to identify links or junctions where there is considered to be a 'clash' between different functions which could potentially impact on particular users in a positive or negative way.

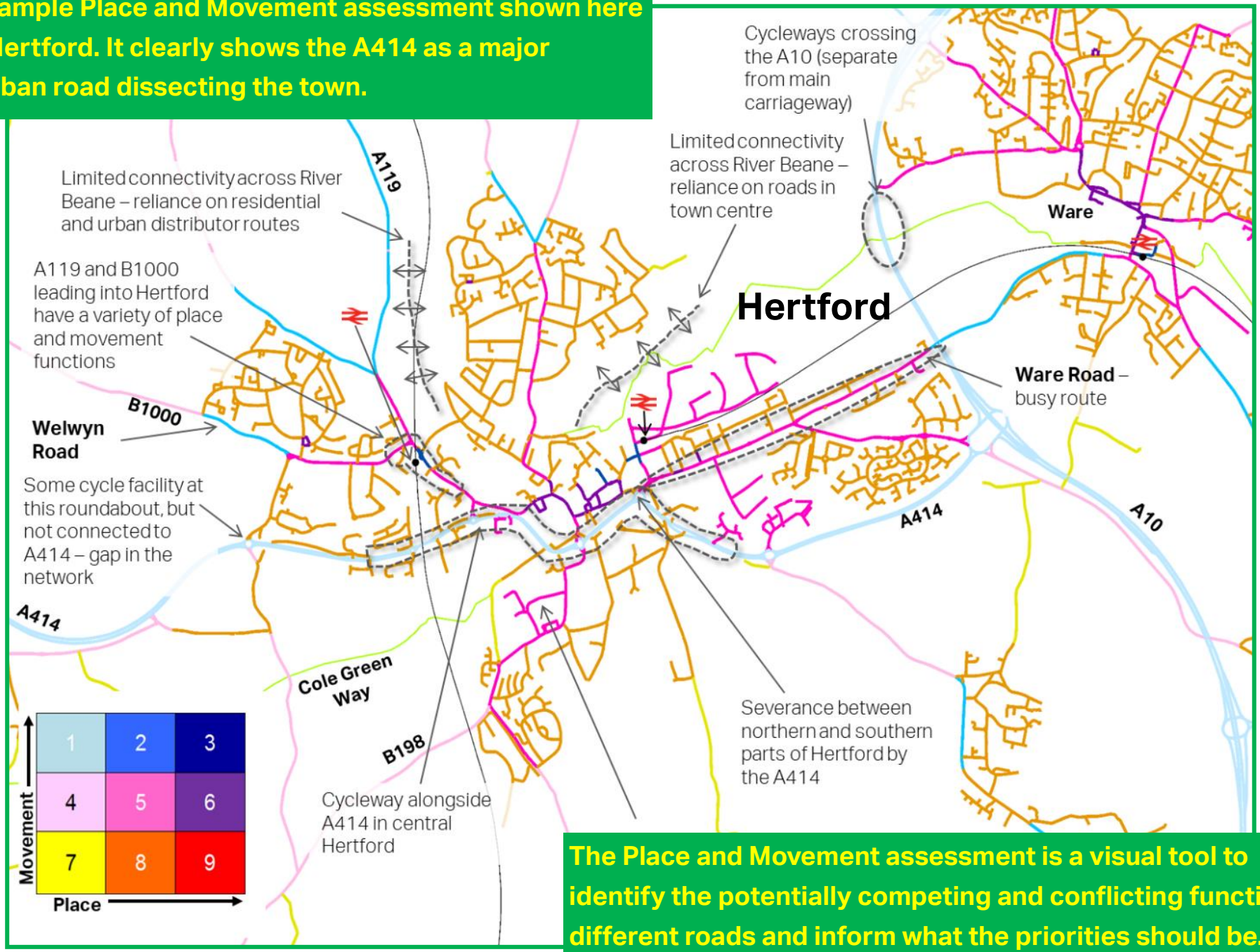
A set of nine road types have been defined. These road types sit within a matrix which qualitatively assesses Place and Movement from low significance to high significance.

Place relates to those functions that are specific to and happen in particular places, including residential and retail. Roads have an impact economically as well as on quality of life, with place-making an increasingly important element in local policy making. Roads are also the foreground to the built environment, and the most successful streets are those that respect and refer to it.

Movement relates to the moving functions across different modes. Roads perform a wide range of movement functions from roads carrying very high volumes and mixes of vehicular traffic and people, to urban streets which only have a local movement function and could give greater priority to the needs of pedestrians and cyclists.



The example Place and Movement assessment shown here is for Hertford. It clearly shows the A414 as a major interurban road dissecting the town.



The Place and Movement assessment is a visual tool to identify the potentially competing and conflicting functions of different roads and inform what the priorities should be.

30 Packages across 14 segments comprising two or more interrelated interventions

Proposed interventions have been assembled into **30 packages** which slot into the 14 corridor segments. The packages are very briefly summarised in this section, with details set out by segment in Annex 1 to Annex 14. The east-west Mass Rapid Transit system is at the heart of the Corridor Strategy and will influence the proposed packages. More detailed work is currently being undertaken to determine the preferred option for the MRT.

It is important for the Corridor Strategy to be integrated with other plans and strategies. Therefore for consistency many of the packages are broadly identical to those in the emerging Growth and Transport Plans as well as the Hatfield Transport Strategy's town-based corridor packages.

The interventions are wide-ranging. It has been the intention to focus only on the more strategic interventions. Very small-scale interventions are not necessarily identified but this does not mean they will be excluded from consideration in the future. Interventions broadly fit into a number of categories as set out below.

A re-prioritised highway network

>Making better use of existing networks

>Taking traffic off inappropriate routes

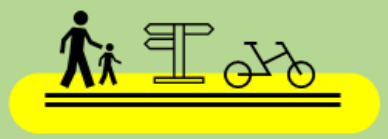
>Enabling users to make more informed travel decisions

Enhanced walking and cycling links

>More joined-up, attractive walking and cycling routes.

>More priority given to pedestrians and cyclists (making it safer)

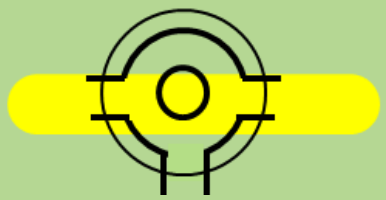
>Improved signage and lighting of routes



Highway upgrades

>Upgrades to highway routes and junctions to reduce traffic congestion and improve journey time reliability

>Upgrades will encourage traffic back to the more appropriate routes and reduce rat-running



Enhanced urban realm

>Reduce the visual and noise intrusion of motorised traffic and improve the streetscape in urban areas to make it more attractive for visitors travelling on foot or by bike

Better Bus & Rail connections and access

>Better facilities and connections to improve interchange onto and off public transport services including local buses and trains

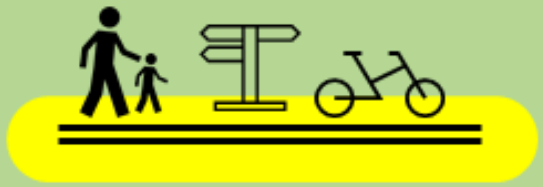
A re-prioritised highway network

The A414 corridor is made up of many different types of roads. Some are major links which enable more traffic to travel faster between places. Some roads are primarily for access to homes and schools. There are many instances where roads are not working in the way they should. This could be to the detriment to local communities or to particular users of the network. The A414 is a higher-speed dual carriageway over much of its length. This is more appropriate between settlements, however it also runs through some towns such as Hertford and Hemel Hempstead.

In combination with very selective highway upgrades and new roads, the needs of different users of the transport network can be enhanced where these are currently not well served. What this could mean is that in some instances, where it is feasible and appropriate, the movement of pedestrians and cyclists could be prioritised over the movement of private cars. In the longer term this is considered to be a more sustainable and appropriate way of making better use of existing infrastructure, and making more targeted and effective investment in transport improvements.

Example interventions include…

Re-allocation of some road space in Hemel Hempstead, Hatfield and Hertford to other modes of travel.



Enhanced walking and cycling links

A range of interventions have been identified to make travelling by bike between key urban areas along the corridor easier and more attractive, and to help reduce some major barriers for pedestrians and cyclist which are created by busy roads.

Improved facilities including better surfacing, signage and crossings can increase the attractiveness and convenience of cycling as a healthy alternative to the car for different types of journeys.

Example interventions include…

- More signal-controlled crossings on the A414 Breakspear Way in Hemel Hempstead
- A new continuous off-road cycle route linking Hemel Hempstead and St Albans
- An improved cycle route alongside the A414 between Park Street, London Colney and Hatfield
- An improved cycle route with new links alongside the A405 between northern Watford and southern St Albans
- Improved footways and crossing facilities in the Broxbourne towns
- Brand new, high quality pedestrian and cycle routes in Harlow

Highway upgrades

The highway network has an important role in connecting people and places. It facilitates the movement of different users although in most cases they prioritise motorised vehicles over pedestrians and cyclists. In line with Hertfordshire County Council's LTP4, the needs of pedestrians and cyclists in particular will be enhanced across the corridor however in some situations it will only possible to fully achieve this by making improvements to some roads and junctions, or constructing new roads, which can remove points at which different users could interact and disrupt one another, and to reduce the use of some roads by motorists as 'rat-runs' to try and avoid delays on the more major routes.

Example interventions include...

- An improved M1 Junction 8 at Hemel Hempstead (and the longer term potential for a new Junction 8a to the north-east of Hemel Hempstead)
- Junction improvements at Park Street and London Colney
- Potential new slip road links at M25 J21
- A strategic intervention around Hertford
- A new River Stort crossing to the north of Harlow

Enhanced urban realm

Enhanced urban realm comprising better connections, attractive landscaping, greenery and high quality materials can enhance a sense of place.

Example interventions include...

- Hatfield Town Centre enhancements; Welwyn-Hatfield Green Corridor; Welwyn Garden City Bridge Road improvements

Better Bus and Rail connections and access

The A414 corridor facilitates journeys to other places. Better connections and access at railway stations can improve journey experience including Hemel Hempstead and St Albans City stations. Local bus services will continue to play an important role in connecting people and places including between London Colney and St Albans and between St Albans and Hatfield. The County Council's ability to influence the commercial public transport network will continue to be through private developer contributions and dialogue with operators through the Intalink Partnership.

Supporting schemes and initiatives

Strategic Intervention

Hertfordshire Mass Rapid Transit

>A Mass Rapid Transit spanning all segments of the A414 corridor is prioritised in this strategy.

Please refer to Chapter 8 for more details.

Sustainable Travel Towns (LTP4)

Comprehensive packages of schemes and behaviour change initiatives aimed at achieving a significant modal shift to non-car modes and reduction in single occupancy car use, will be prioritised in key towns along the corridor and across Hertfordshire as a whole.

Packages could feature improved cycling, walking and passenger transport infrastructure and service levels, in combination with initiatives such as travel planning and marketing. Park & ride and other parking demand management approaches should also be considered to complement improvements in passenger transport, and improved provision for sustainable modes in the towns.

Sustainable Travel Towns provide the potential for greater housing density and car free development, and therefore could support the future delivery and development of local land use plans. The detailed criteria for any settlement being included in the Sustainable Travel Towns programme will be subject to further local discussion to ensure that they have the support of key stakeholders and the wider community.

Cycle Infrastructure Improvement Towns (LTP4)

In line with Policy 8 of the county council's Local Transport Plan 4, a number of towns are identified where the DfT's Propensity to Cycle Tool identifies the most heavily used cycle routes in the future. Some towns have a small number of popular routes, others have many.

Within the A414 corridor, Hemel Hempstead, Watford, St Albans, Hatfield, Welwyn Garden City, Hertford, Ware, Broxbourne and Hoddesdon have been identified as Cycle Infrastructure Improvement Towns.

Notable Improvements and Major Schemes (LTP4)

Included within the LTP4 recommendations for major schemes are proposals for an east west bus rapid transit system and a programme of A414 highway improvements including a Hertford bypass, if it contributes to more objectives than just the facilitation of traffic flow.

Proposed Packages of Interventions (1)

PK1 Hemel Hempstead East-West Corridor

Form an east-west, cross-town corridor which facilitates attractive and convenient journeys on foot, by bike, by bus and also by car between Hemel Hempstead railway station, the Town Centre, Jarman Park and Maylands industrial area.

S1

PK2 Maylands and East Hemel Hempstead

Provide improved access to the Maylands Hertfordshire IQ Enterprise Zone and the wider East Hemel Hempstead Garden Community from within Hemel Hempstead and outside of the town by all modes of travel.

S1

PK3 Hemel Hempstead-Park Street -St Albans Connectivity

Maintain the A414 's role as an inter-urban corridor facilitating medium and longer distance trips, and providing greater mode choice across both the A4147 and A414 to help mitigate the effects of increased traffic, including that arising from planned housing and employment growth in the surrounding area.

S2

PK4 St Albans-Watford Corridor

Transform the A405 into a multi-modal road by diverting strategic traffic onto the motorway network, freeing up space for more local journeys by bus, bike or by car.

S3 S4

PK5 Chiswell Green Active Travel Improvements

Improve connectivity between Chiswell Green, Park Street and St Albans, and reduce through traffic on the B4630 corridor.

S5

PK6 South of St Albans and London Colney Cycle Improvements

Provide enhanced east-west connectivity to the south of St Albans through active travel connections via London Colney.

S6

PK7 St Albans - Hatfield Alban Way Enhancements

Enhance the Alban Way and promote it as a safe, convenient and attractive option for trips between St Albans and Hatfield.

S6

PK8 St Albans City Station Accessibility

Improve accessibility by active modes to St Albans City station, particularly through strengthened connectivity between the station and the city centre.

S6

PK9 A1057 Hatfield Road Corridor (St Albans)

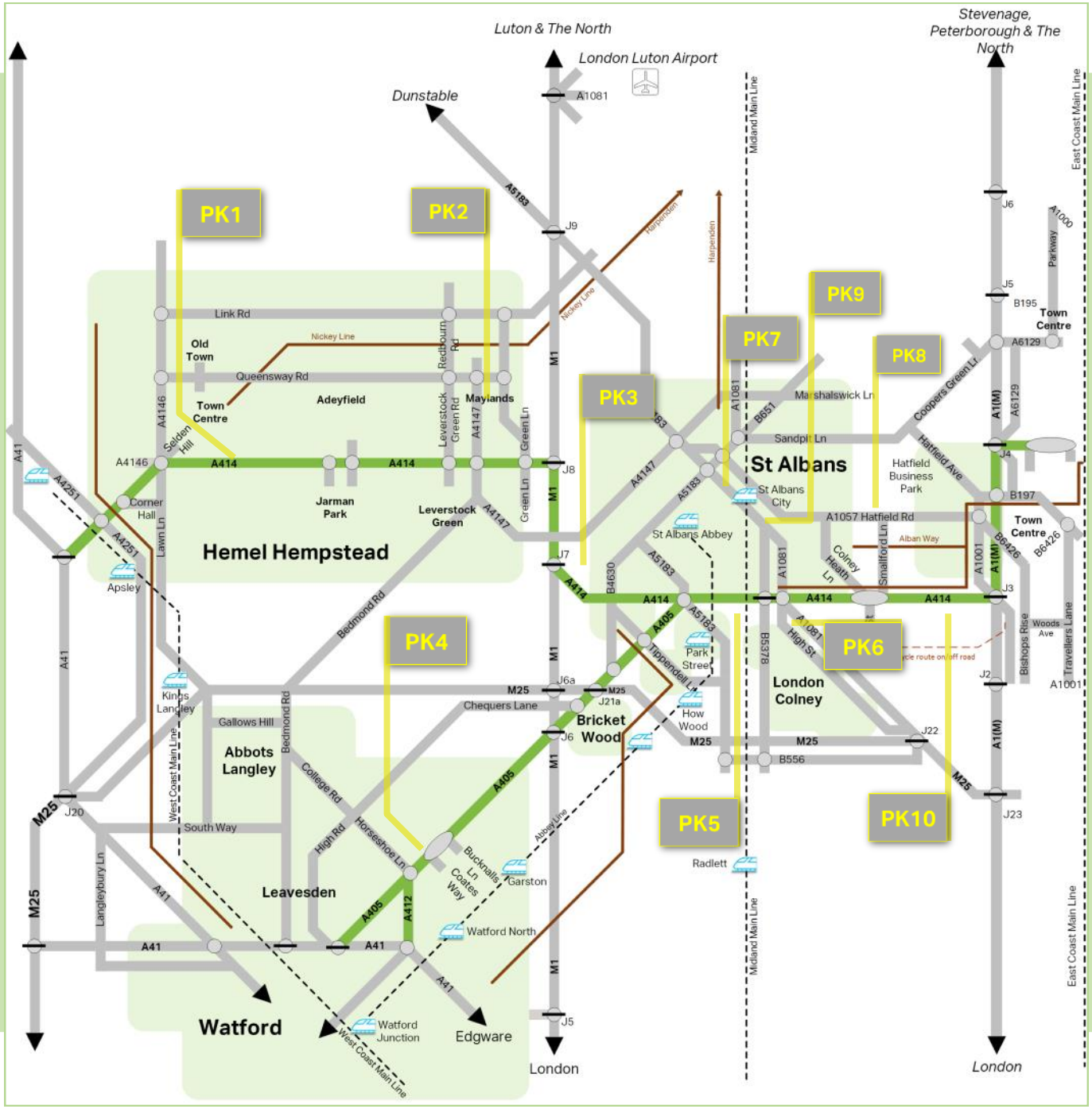
Transform Hatfield Road in St Albans into an attractive and inviting high street and enhance its function as an efficient public transport corridor.

S6 S7

PK10 A1081 London Road Corridor (St Albans)

Make London Road a more attractive place for pedestrians and cyclists, and improve reliability of journeys along the corridor.

S6



Proposed Packages of Interventions (2)

PK11 A414 Highway Improvements (South of St Albans)

Enhance the function of the A414 as a strategic east-west route in south central Hertfordshire through capacity and reliability upgrades.

S6

PK12 London Colney Strategic Public Transport Connectivity

Integrate London Colney into broader east-west public transport connections within south central Hertfordshire.

S6

PK13 St Albans-Hatfield Local Connectivity

Enhance local transport between St Albans and Hatfield and facilitate growth along the Sandpit Lane-Coopers Green Lane corridor.

S7

PK14 Hatfield College Lane/ Cavendish Way Corridor

Reduce severance and improve conditions for pedestrians and cyclists along the College Lane/Cavendish Way corridor, enhancing connectivity between the university campuses and Hatfield town centre.

S8

PK15 Hatfield Cavendish Way/ Queensway Corridor

Reprioritise the main transport corridor through Hatfield town centre to reduce the dominance of motorised vehicles, improve connectivity to the surrounding area and make a more attractive entrance to the town centre.

S8

PK16 Hatfield French Horn Lane Corridor

Increase active transport provision between Hatfield town centre and the train station by improving facilities for pedestrians and cyclists.

S8

PK17 Hatfield - Wellfield Road Corridor

Implement sustainable transport improvements along the Wellfield Road corridor, providing greater mode choice for trips between the Hatfield Business Park and the town centre.

S8

PK18 Hatfield - St Albans Road East/Hertford Road Corridor

Reduce severance in north east Hatfield and enhance connectivity between The Ryde residential area, the town centre and railway station.

S8

PK19 St Albans-Welwyn Garden City Connectivity

Form a sustainable transport corridor between St Albans and Welwyn Garden City, facilitating attractive and convenient journeys on foot and by bike between the towns with links to the Symondshyde and North West Hatfield developments, as well as Hatfield Business Park..

S8

PK20 A1(M) Junction 4

Reduce congestion and increase reliability for inter-urban trips at A1(M) Junction 4 and adjoining links and junctions on the A414.

S8 S9 S10

PK21 Hatfield-Welwyn Garden City Connectivity

Strengthen local connections between Hatfield and Welwyn Garden City by active travel modes, encouraging modal shift from private car and improving recreational facilities within the Green Corridor running between the towns.

S10

PK22 Welwyn Garden City Bridge Road Transformation

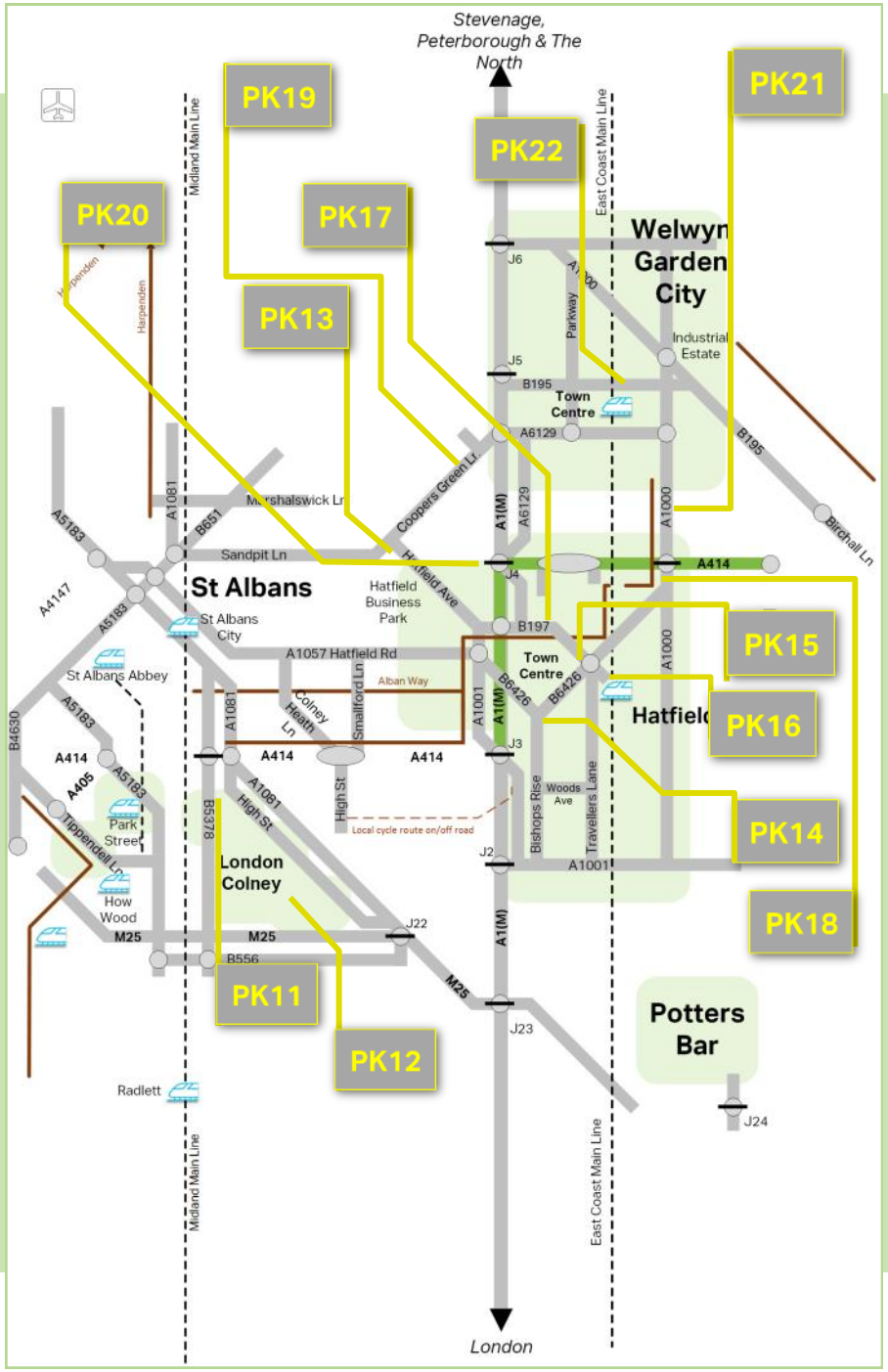
To transform Bridge Road into a sustainable spine that enhances connections on foot, by bike and by bus between the Welwyn Garden City town centre and the employment zone east of the rail line, and reduce the dominance of motorised traffic.

S9

Key

PK# Package

S# Segment



Proposed Packages of Interventions (3)

PK23 Hertford Sustainable Travel Improvements

Provide a step-change in sustainable travel connectivity across Hertford through the provision of high quality pedestrian and cycle routes, crossings and public transport.

S11

PK24 Hertford Strategic Intervention

Review the need for a strategic intervention to address high volumes of through traffic in Hertford and facilitate sustainable travel improvements including the MRT

S11 S12

PK25 Brookfield Connectivity

Provide transport improvements to facilitate better connectivity and access between major growth planned at Brookfield and the wider Broxbourne area.

S12

PK26 Broxbourne Area - PT Improvements

Provide a range of enhancements to public transport services and infrastructure which encourage a modal shift from private car for journeys within, into and out of the Broxbourne area.

S13

PK27 Park Plaza Improvements (Cheshunt)

Provide a combination of highway and public transport improvements to facilitate planned employment-led development at Park Plaza

S13

PK28 Road improvements across Broxbourne

Improve the local highway network across Broxbourne to help manage traffic congestion and support sustainable economic growth.

S13

PK29 Enhancements for pedestrians and cyclists across Broxbourne

Provide enhanced connectivity for pedestrians and cyclists making local journeys within the Broxbourne towns through the provision of new/ improved attractive walking and cycling routes.

S13

PK30 Harlow and Gilston Garden Town Transport Improvements

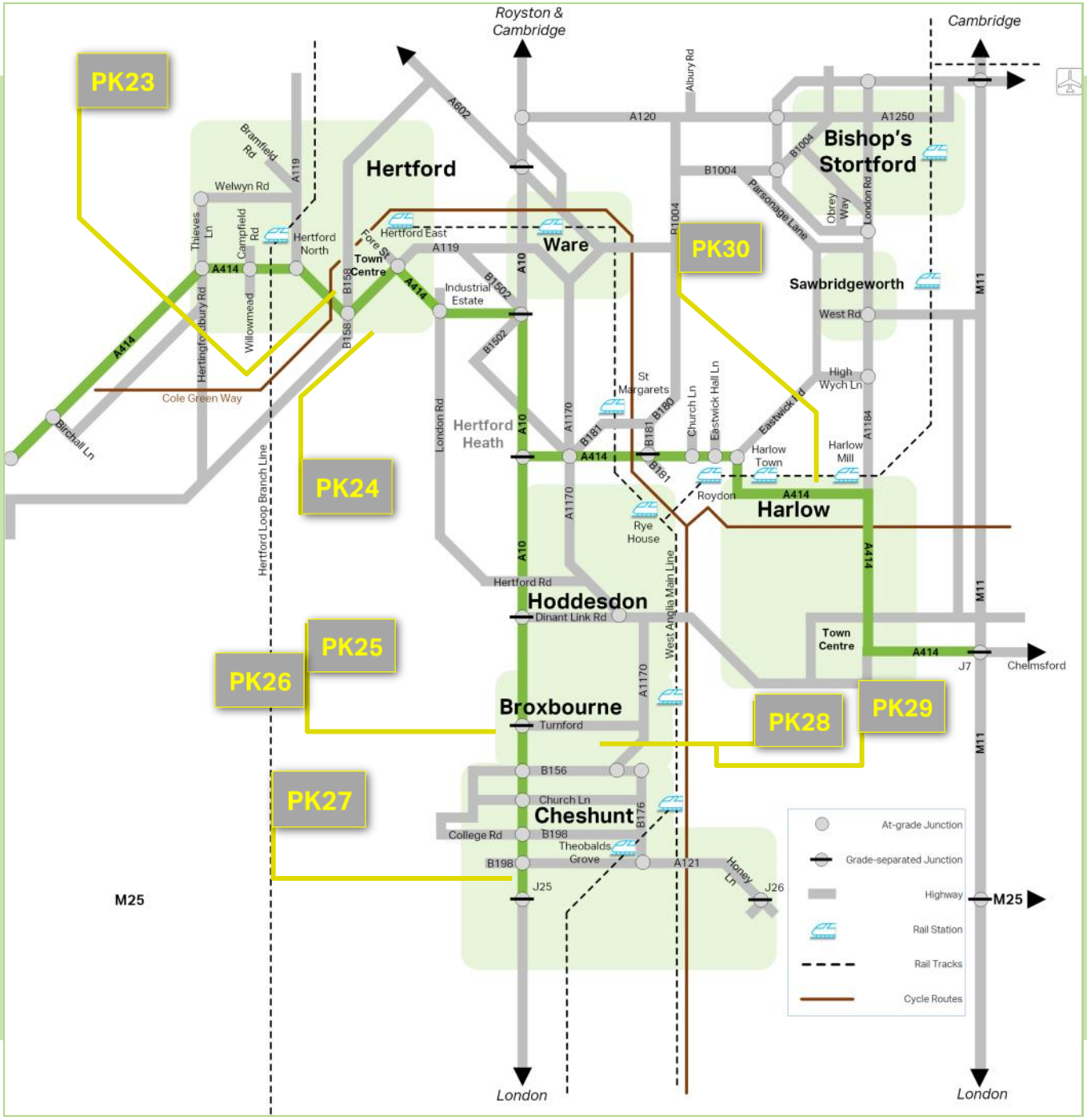
Provide a package of multi-modal transport improvements and brand new facilities to help facilitate large-scale sustainable development in and around Harlow.

S14

Key

PK# Package

S# Segment


PK23
PK24
PK25
PK26
PK27
PK28
PK29
PK30
Royston & Cambridge
Cambridge
London
London
Hertford
Ware
Bishop's Stortford
Sawbridgeworth
Hertford Heath
Hoddesdon
Broxbourne
Cheshunt
Harlow
Hertford East
Hertford North
Town Centre
Industrial Estate
St Margarets
Harlow Town
Harlow Mill
Roydon
Rye House
Turnford
Dinant Link Rd
Hertford Rd
Church Ln
College Rd
Theobalds Grove
Honey Ln
Parsonage Lane
West Anglia Main Line
Hertford Loop Branch Line
Cole Green Way
Chelmsford
M25
A10
A414
A120
A1250
A602
A119
A1170
A121
B1004
B1502
B156
B158
B176
B180
B181
B198
J7
J25
J26
At-grade Junction
Grade-separated Junction
Highway
Rail Station
Rail Tracks
Cycle Routes

8 | Mass Rapid Transit

The challenges set out earlier in this Corridor Strategy highlight the high levels of traffic congestion and poor east-west public transport connections between towns. A new public transport route - a Mass Rapid Transit system - is identified as a priority in LTP4 and seeks to remedy some of the current poor east-west connection issues in Hertfordshire and provide greater choice for people travelling between towns.

What is Mass Rapid Transit?

This strategy identifies the potential for a new Mass Rapid Transit (MRT) system spanning the A414 Corridor and makes it the priority of the strategy. A MRT system would need to link the major urban settlements and be a fast, efficient, affordable and frequent service which is an attractive alternative to the car.

A MRT can take different forms for example a high quality express bus route or a tram. There are many examples from across the world with unique features tailored to their particular local needs. Further work is currently being undertaken to identify the preferred option for Hertfordshire. In the Hertfordshire context, a MRT would need to tick the following boxes:

What does a MRT look like?

A MRT service could take the form of a high quality bus or articulated bus running along a conventional road, bus lanes and / or its own dedicated carriageway; or a tram running along dedicated track or within urban streets.

If it takes the form of a bus, a dedicated highway could be guided whereby the bus runs along a concrete track which can enable vehicles to reach higher speeds on tighter alignments, such as the Cambridge-St Ives Guided Busway and the Luton-Dunstable Busway.

A bus-based system could use vehicles which are diesel powered, hybrid electric buses which combine a conventional internal combustion engine with an electric battery; or fully electric.

A MRT could take the form of an electric tram which runs on rails, often but not always separated from other highway traffic.

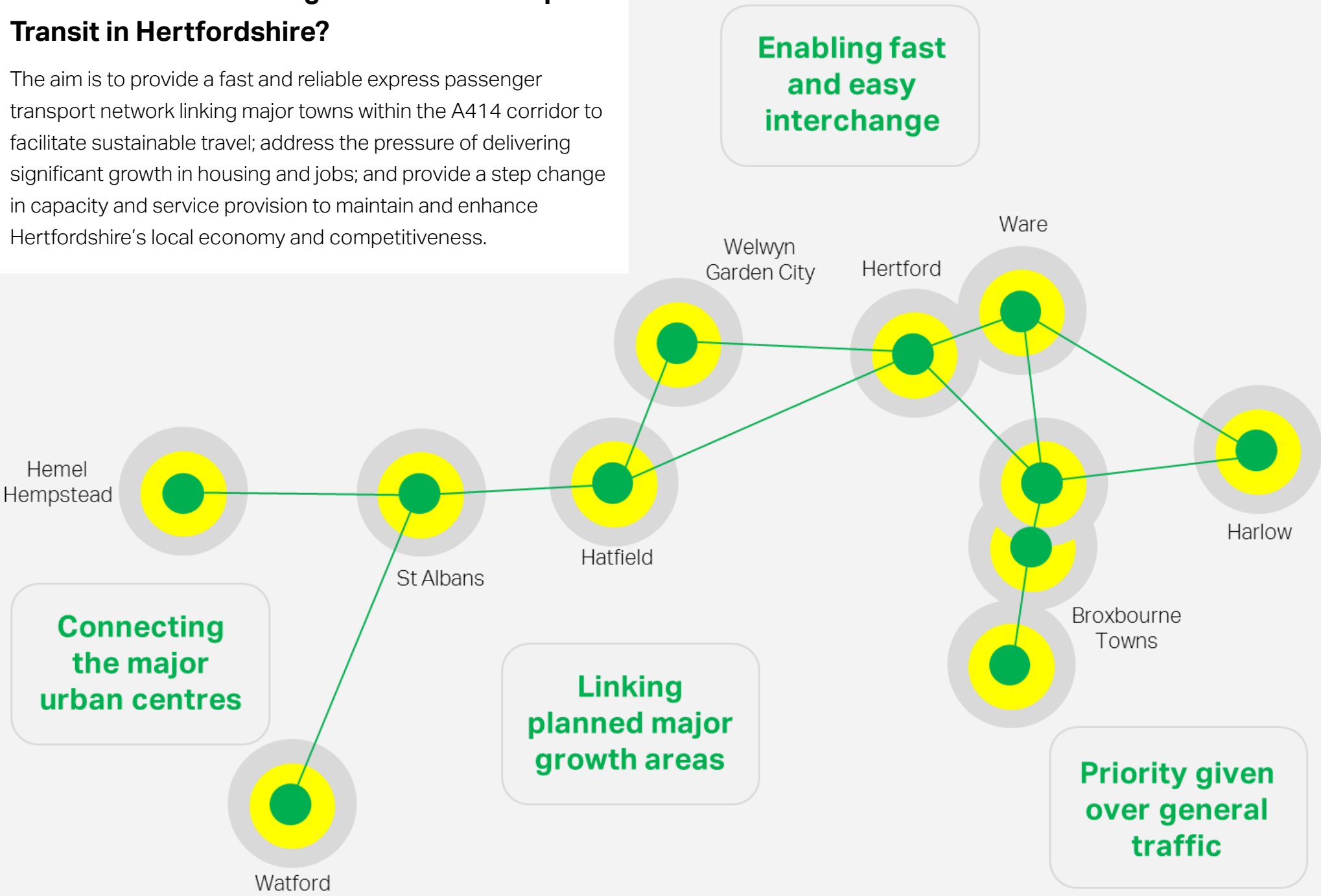
Furthermore, a MRT network could comprise more than one mode-type if two modes can be closely integrated.

Belfast Glider service - using 18 metre long, articulated vehicles with 105 people capacity

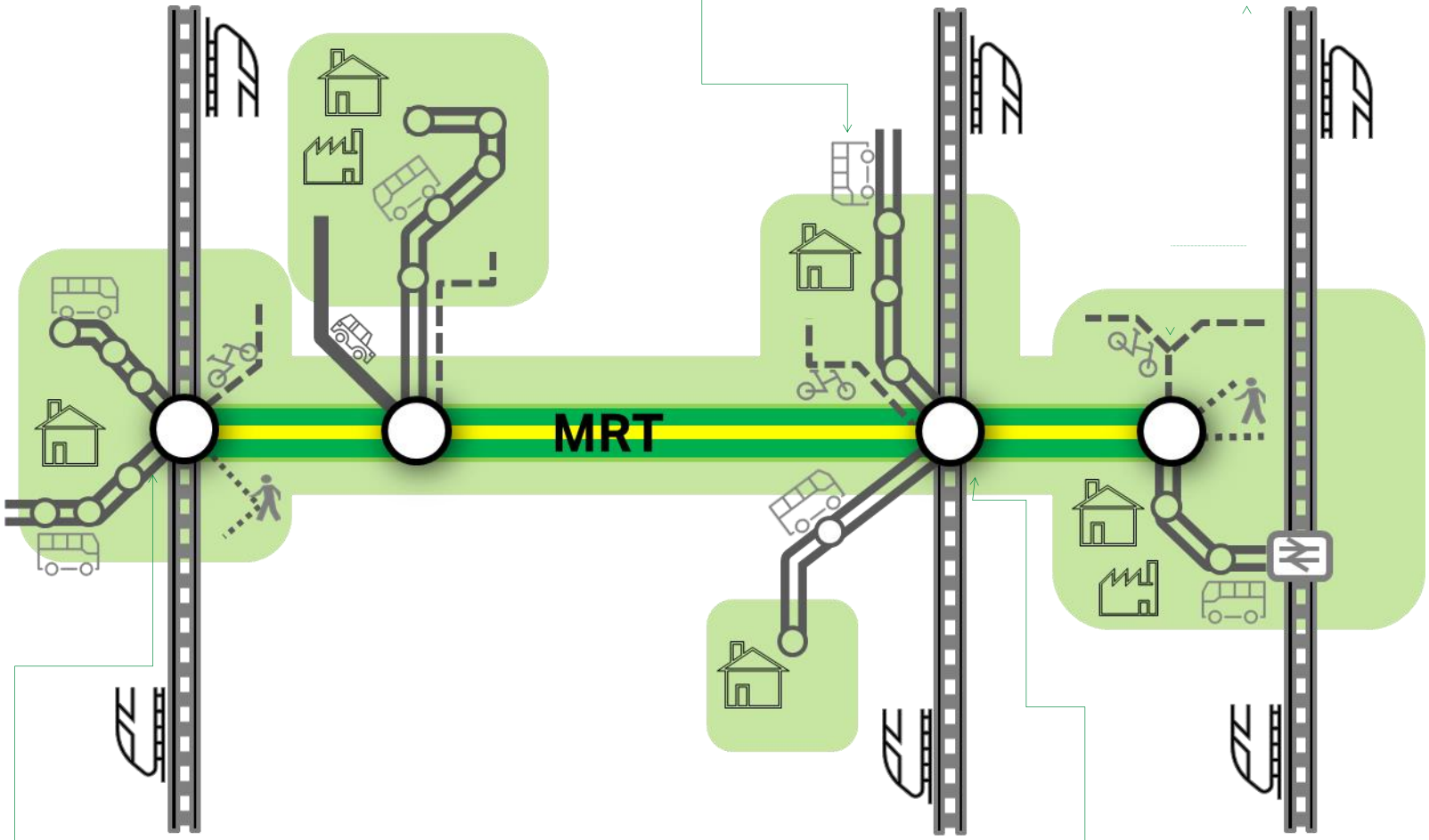
West Midlands Metro - using electric trams powered by overhead cables

What is the overarching aim of a Mass Rapid Transit in Hertfordshire?

The aim is to provide a fast and reliable express passenger transport network linking major towns within the A414 corridor to facilitate sustainable travel; address the pressure of delivering significant growth in housing and jobs; and provide a step change in capacity and service provision to maintain and enhance Hertfordshire's local economy and competitiveness.



- It may not be feasible for a MRT to connect to all places. An integrated travel network will be required for a MRT to be successful, encompassing all modes of travel - car, bicycle, walking and local bus.
- Some local bus routes will be reconfigured and improved to act as feeder services to the MRT.
- Walking and cycling networks will be improved to provide better local links to MRT interchanges.



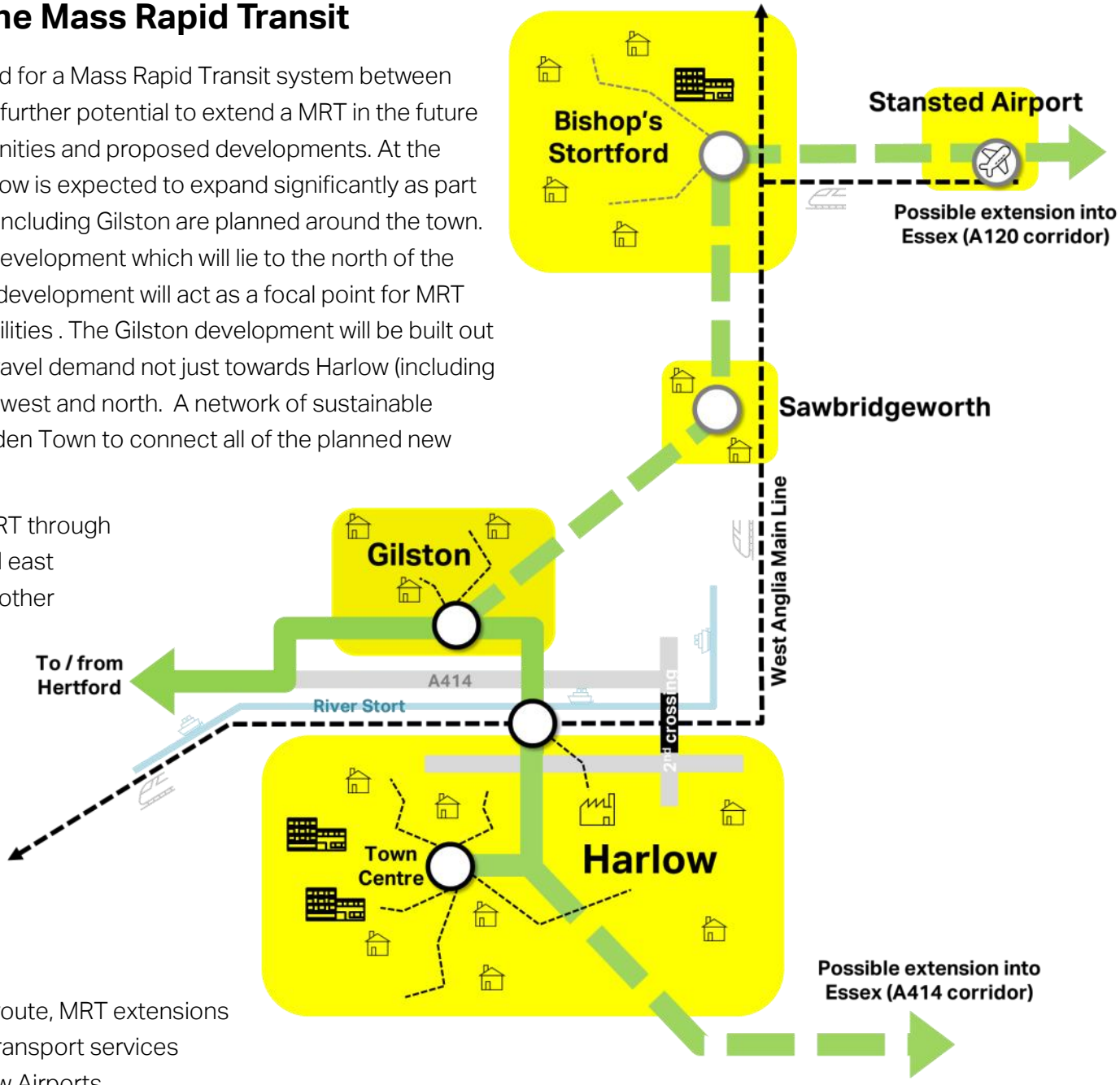
- Some MRT interchanges could be located at stations on major railway corridors including the West Coast Main Line and East Coast Main Line; at edge of town locations; adjacent to major employment areas (including Maylands and Hatfield Business Park), and in town centres.
- MRT Interchanges will be high quality, providing a range of facilities including seating, shelters, real time information, wi-fi access and cycle parking. Some interchanges could have enhanced facilities including car parking/drop-off, lockers etc.

Potential future extensions to the Mass Rapid Transit

The Corridor Strategy identifies the potential need for a Mass Rapid Transit system between Hemel Hempstead, Watford and Harlow. There is further potential to extend a MRT in the future to serve the needs of existing or planned communities and proposed developments. At the eastern end of the MRT network, the town of Harlow is expected to expand significantly as part of a Garden Town initiative. Large developments including Gilston are planned around the town. The MRT will certainly need to serve the Gilston development which will lie to the north of the A414 corridor. An interchange within the Gilston development will act as a focal point for MRT services, local buses, and walking and cycling facilities . The Gilston development will be built out over a number of years and is likely to generate travel demand not just towards Harlow (including the railway stations) but also to areas to the east, west and north. A network of sustainable transport corridors are proposed across the Garden Town to connect all of the planned new communities.

Destinations to the west would be served by a MRT through Hertfordshire, however locations to the north and east such as Bishop's Stortford, Stansted Airport and other parts of Essex could also create new journeys from Gilston and the wider Garden Town. Similarly, trips could be generated from areas of Essex including along the A414 and A120 corridors. In the absence of high quality, frequent public transport connections east-west across Essex, an extended MRT system could provide a much improved cross-boundary public transport service.

Towards the western end of the envisaged MRT route, MRT extensions or enhanced connectivity with other passenger transport services could be considered towards Luton and Heathrow Airports.



9 What can be achieved

Introduction

Hertfordshire County Council's strategic transport model, COMET, is a key evidence tool for the A414 Corridor Strategy. The model was developed to help HCC understand how the transport network could operate in the future under different conditions.

COMET represents the county as well as surrounding areas, and includes roads as well as bus and rail services. It does not include every road or public transport service, but it provides at a strategic level forecasts of how travel behaviour and volumes of trips could change in the future. The model represents weekday morning and evening peak hours and an hour representative of the weekday inter-peak between 10am and 4pm.

The model can be used to test the transport effects of a change in the number or distribution of homes, population and jobs. It can be used to test different scenarios in terms of where increases in population could occur, including particular development sites, in line with the districts' and boroughs' Local Plans. It can also be used to test different types of transport improvements.

COMET has been used to carry out an indicative test of the interventions put forward in this Corridor Strategy. Many of the interventions identified are concepts, with limited detail on how the interventions could actually be implemented. Instead, broad assumptions have been made such as the roads new bus routes could take, the number of extra lanes at an improved junction, and changes to traffic signal timings to reflect bus priority or additional pedestrian and cyclist crossings.

Methodology

Testing the impact of interventions using COMET has focused upon two scenarios, both tested for a forecast year of 2031.

The first scenario is referred to as the 'Do Minimum'. i.e. compared to the present day, only already committed or funded transport schemes are implemented, or the minimum required for new development sites to connect to/ access the existing transport network.

The second scenario, referred to as the 'Do Something', assumes key interventions put forward in the Corridor Strategy are implemented in addition to those in the Do Minimum.

It is not possible to test all interventions because COMET is not detailed enough to test smaller scale interventions, in particular improvements to cycle routes and footways. It is however possible to make an adjustment in the model which reflects how people may be attracted to shift from private car to walking and cycling in urban areas to represent the substantial

improvements in pedestrian and cyclist facilities across the A414 Corridor, as well as broader initiatives to encourage more sustainable travel behaviour including the Sustainable Travel Towns.

Both scenarios assume planned housing and employment developments identified in current or emerging Local Plans will be implemented, including access routes and committed transport improvements.

In practice, not all of the interventions put forward in this Corridor Strategy will be implemented by 2031. Some may only be partially complete, such as a Mass Rapid Transit. The model assumes therefore that interventions are approved, developed, fully funded and implemented by 2031. However in reality some interventions could take longer to come forward because they are more complex to develop.

A comparison between Do Minimum and Do Something scenarios can help indicate how the transport network could be influenced by interventions. Using the COMET model it is possible to identify changes in journey times between places and on specific roads or bus services, delays which could be incurred at particular junctions, mode share between car, public transport and walk/cycle.

Predicted Outcomes

The potential outcomes of proposed interventions put forward in the Corridor Strategy are considered below in relation to Public Transport, Walking and Cycling and Highways.

It should be noted that for model testing purposes, the MRT has been assumed to take the form of a bus, however this is not necessarily the preferred option that will be taken forward. Further testing of options will be required once more detailed studies are completed.

Public Transport

An estimated 9% increase in public transport trips

Significantly reduced journey times by public transport between key urban areas along the corridor

Improved journey time reliability as buses can use priority lanes and traffic signals

Key employment areas better connected by public transport including Maylands Enterprise Zone and Brookfield Retail Centre

Increased public transport mode share by up to 5% in areas including Maylands (Hemel Hempstead), south west Hatfield, Panshanger (Welwyn Garden City) and Cheshunt

An increase in public transport trips will most likely arise with substantial improvements to services including the cross-county Mass

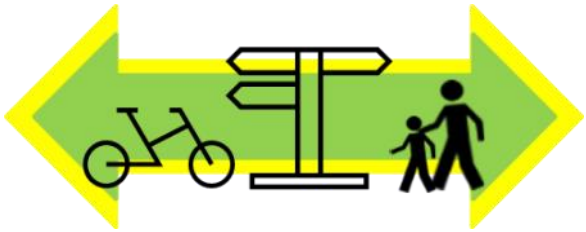
Rapid Transit system between Hemel Hempstead, Watford, Hatfield and Harlow, as well as changes to local bus and inter-urban coach services, including between Luton and Hemel Hempstead, and between Potters Bar, London Colney and St Albans. As well as new MRT services, there are also changes to existing service routes, the introduction of bus priority and increases in service frequencies which all increase the attractiveness of public transport.

Journey Time Comparison	Do Minimum Local Bus	Do Something MRT	Journey Time Saving
Hemel Hempstead to Welwyn Garden City	113 mins	56 mins	-56 mins (-50%)
Watford to St Albans	74 mins	48 mins	-25 mins (-34%
Welwyn Garden City to Hertford	61 mins	46 mins	-14 mins (-24%)
Notes: The above journey times are based on the AM peak including waiting times and the time passengers spend on board			

The table above presents indicative journey time savings that could be achieved with a Mass Rapid Transit system between key urban areas along the corridor (as indicated earlier, for testing purposes this is formed of an express bus service).

Such reductions in journey times will make travelling by public transport between urban areas a far more attractive alternative to the car.

Walking and Cycling



An estimated 5% increase in walking and cycling trips

Improved routes for cyclists encourages trips within and between towns by bike

The estimated increase in walking and cycling trips reflects the proposed improvements to walking and cycling facilities.

As noted earlier, it is not always feasible to include smaller-scale interventions in COMET including improvements to footways and cycle routes and therefore a broad assumption has been made about the predicted shift to walking and cycling that could occur as a consequence of not only physical improvements but broader initiatives which encourage sustainable travel behaviour.

Highways

Potential reduction in highway trips compared to the Do Minimum

Managed traffic delays at key junctions and on sections of the A414

Reduced rat-running on less appropriate roads such as country lanes and residential streets to avoid congestion elsewhere

A combination of improved pedestrian and cycle routes and public transport, as well as reduced highways capacity particularly in urban locations targeted for public realm improvements, will see a reduction in the number of highway trips relative to the Do Minimum.

Traffic congestion will still occur at different locations across the network and be worse in the future, but the comparison between the Do Something and Do Minimum scenarios shows that there could be reductions in traffic delays along key highway links and at junctions, for example M1 Junction 8 (Hemel Hempstead), around M1 J6, M1 J6a/M25 J21 and M25 J21 (Bricket Wood Triangle) and in Hertford, as a result of a combination of highway interventions and improvements to alternative modes.

The comparison test using COMET has demonstrated that it could be possible, with substantial investment in a range of interventions, to help manage levels of traffic congestion by providing selective increases in highway capacity alongside a step change in the quality of public transport services which can attract people out of their cars and enable them to make healthier and less stressful journeys.

The modelling has also demonstrated that forecast increases in population and employment, assuming current travel behaviours remain similar to today, will result in increases in travel demand and congestion in the future. It is therefore essential to implement a package of measures to manage as well as cater for this travel demand and effect mode shift to more sustainable modes.

Whilst not explicitly modelled in COMET, behaviour change supported by targeted marketing and promotion is assumed to be part of the mix to encourage use of sustainable modes.

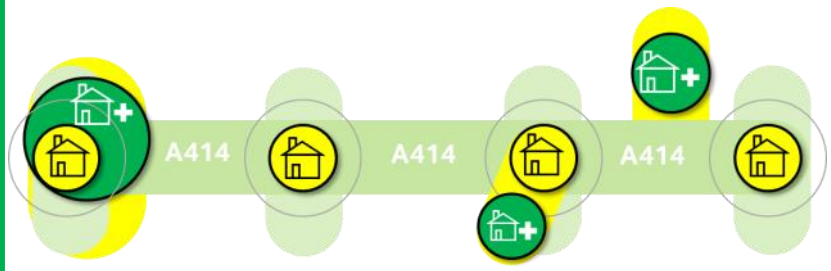
In addition, COMET does not explicitly model land use changes that might be brought about by changes in transport provision and accessibility, but step changes in public transport provision and reliability, as well as improved walking and cycling infrastructure, may change the nature of transport - land use interactions and travel behaviour in the future.

10 | Conclusion

The provision of high quality transport infrastructure and services is an essential in facilitating the transport of goods and services and enabling people to access jobs, go shopping, travel to/from school and visit family and friends, and in the delivery of sustainable and accessible development. Transport facilitates access to work, school, leisure and vital services such as healthcare. Sustainable travel involving an element of walking and cycling may have health benefits.

Businesses are reliant upon an efficient, safe and reliable transport system in order to attract employees and customers, as well as for the transport of goods and services. As well as catering for existing requirements, transport can help unlock or be a constraint on new opportunities, both for economic development and for individual wellbeing.

Good planning practices can help identify the conditions needed to operate an efficient transport system and facilitate growth proposals. If the planning process is not equipped to deal with these requirements, the delivery of sustainable development could be delayed or prevented, with long lasting negative consequences on towns and communities.



Hertfordshire is facing significant levels of **housing and employment growth** which are expected to have an impact on the county's local and strategic transport network in the short, medium and long term. In a post-recession economy, delivering economic growth has become one of the UK Government's main priorities. However, this is set against a backdrop of increasing competition for funding to invest in new infrastructure, and the need to demonstrate a strong case for the role of transport in enabling sustainable growth.

The transport needs of large-scale residential and employment developments coming forward within Hertfordshire and surrounding areas may be reliant upon funding from Central Government and elsewhere, and this funding may only be obtained if a good case is made for investment which is based on robust evidence and collaborative planning.

Set against this backdrop, Hertfordshire County Council has developed this **A414 Corridor Strategy** to confirm the key current and future growth and transport challenges and proposed set of intervention packages in what is one of the most vital transport corridors spanning the county.

The A414 Corridor is a strategic east-west multi-modal transport corridor extending from Harlow in the east to Hemel Hempstead in the west. In addition, the A405 extending down from St Albans towards Watford, and the A10 from the west of Hertford to M25 Junction 25,

also act as important cross-county routes.

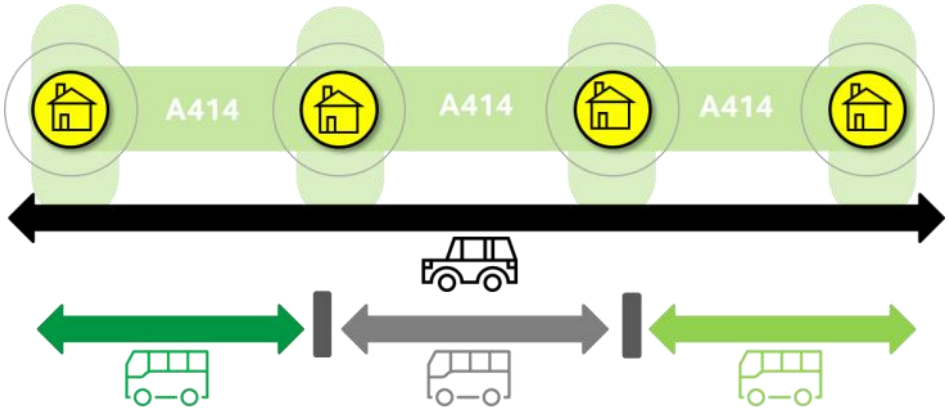
The provision of transport infrastructure and facilities varies significantly along the length of the corridor.

Today different parts of the corridor experience traffic congestion on roads including to the south of St Albans at the A414/A1081 London Colney Roundabout, the A414/A405 Park Street Roundabout and at M25 J21a (Bricket Wood), to the north of Hatfield at A1(M) Junction 4, and in Hertford.

The A414, A10 and A405 roads themselves carry a lot of traffic between towns along the corridor but at a local level the presence of wide roads and fast moving traffic can disconnect local communities and create issues for people travelling on foot or by bike.

Current levels of traffic congestion will only be made worse by the expected large growth in housing, population and employment in the coming years unless action is taken to provide better public transport services and walking and cycling routes. At least 50,000 new homes and a similar number of new jobs are proposed within the corridor.

There very limited opportunities for continuous travel by public transport, and in many cases a journey by public transport may require interchanging between relatively infrequent bus services or taking trains into and out of London.



The planned housing and employment growth will generate new demand for travel and place greater pressure on the corridor's transport infrastructure and services which already experience severe pressure today.

A co-ordinated and consistent strategy for the A414 corridor is therefore necessary to ensure the network can adequately cater for a diverse range of journey lengths and purposes in the short, medium and long term, and facilitate sustainable growth in homes and jobs.

This report sets out the rationale for the Corridor Strategy, supporting evidence and proposed packages of interventions to equip the corridor for the short to long term.

Eleven objectives were defined to structure the Corridor Strategy:

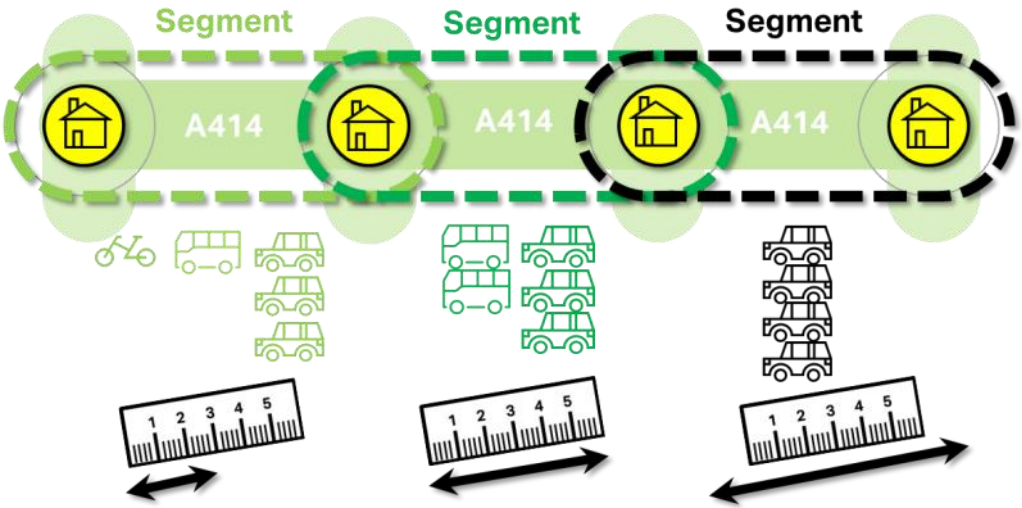
- **Support sustainable economic growth**
- **Improve inter-urban connectivity**

- **Define an appropriate route hierarchy**
- **Improve operation, resilience and reliability of the transport network**
- **Enhance sense of place and town centre viability**
- **Enable and facilitate modal shift to active travel**
- **Enable and facilitate modal shift to public transport**
- **Implement demand management to support efficient use of the network and enable behaviour change**
- **Incorporate the benefits of new technology to support efficient use of the network and enable behaviour change**
- **Ensure safe and secure travel**
- **Deliver better environmental outcomes**

For the purposes of analysis and developing more tailored interventions to help address key growth and transport challenges, the corridor was divided into fourteen segments. These segments are intended to reflect how the corridor currently functions differently along its length, and how it is predicted to function in the future, in particular the types of trips made on different parts of the corridor.

Some segments are more strategic in character, carrying a greater proportion of longer distance trips which use the A414 corridor to travel elsewhere in Hertfordshire and beyond, recognising that the A414 itself links together some nationally significant north-south motorways such as the M1 and A1(M).

Other segments carry more of a mixture of shorter and longer distance trips which reflects the locations of towns which are quite closely spaced and generate a complex pattern of trips by different modes.



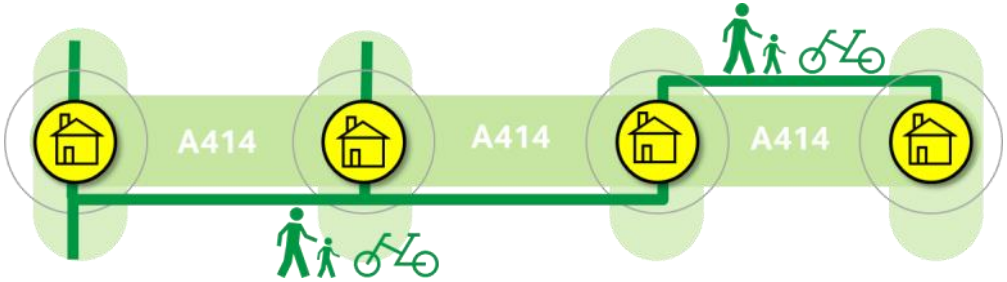
This Corridor Strategy has drawn from existing adopted plans and strategies to develop a list of interventions which seek to address the growth and transport challenges in the corridor. Other plans and strategies include the Hatfield 2030+ Transport Strategy, Broxbourne Transport Strategy and Hertfordshire County Council's South West Hertfordshire Growth and Transport Plan.

Thirty packages have been developed, each containing two or more specific interventions. Interventions are wide ranging in scale and the type of users they aim to benefit.

In line with the priorities of Hertfordshire County Council's Local Transport Plan 4, this Corridor Strategy recognises the opportunities for encouraging modal shift particularly for shorter distance trips within

towns and in some situations between towns, from car to walking and cycling.

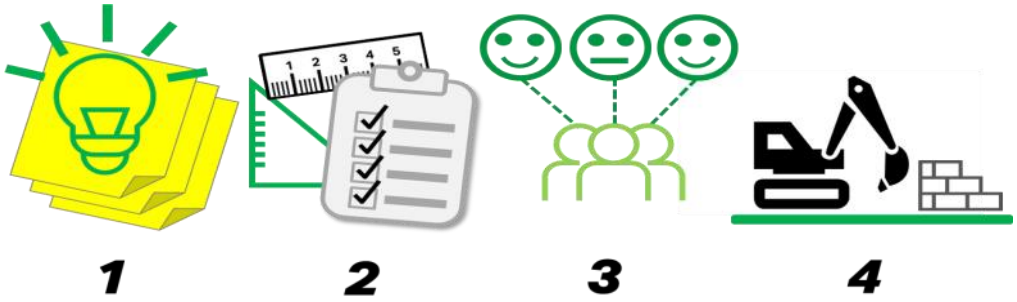
If safe, attractive and more direct routes can be provided for pedestrians and cyclists, this could have a beneficial effect on the health and wellbeing of the corridor's population. New and much improved cycle routes between and through towns alongside key roads for instance will help facilitate faster and more convenient journeys by bike between settlements, for example from London Colney to Hatfield and from Hemel Hempstead to St Albans.



Clearly walking and cycling will not be a suitable way to travel for everyone. The corridor's traffic congestion issues partly stem from the fact there is no fast, frequent public transport link between key towns. The private car is still the most convenient door-to-door mode of travel for many people, despite increasing levels of congestion. In recognition of future increases in traffic delays attributed to population growth across the corridor and beyond, there is an opportunity to achieve a significant modal shift or to encourage more sustainable travel behaviours for new residents and employees within the corridor. The implementation of a **cross-county Mass Rapid Transit** system could be a critical scheme for achieving significant modal shift. This transit system would link key settlements, employment locations and transport hubs, and provide a fast, frequent alterative to the car with some dedicated infrastructure to enable Mass Rapid Transit services to avoid areas of traffic congestion and get people to their destinations in a comfortable and more efficient way. More detailed work will be undertaken to identify a preferred option for a Mass Rapid Transit system and how it could be delivered.

The Corridor Strategy also identifies the need for more targeted highway capacity improvements to alleviate the more immediate traffic congestion issues, such as at the A414/A1081 London Colney Roundabout. In some situations, highway capacity improvements may be necessary to facilitate a Mass Rapid Transit system and other sustainable travel improvements. For instance, once the preferred option for the Mass Rapid Transit system has been confirmed, further work is needed to determine whether a strategic intervention, for example a bypass, is needed around Hertford to enable improvements to the sustainable travel network. The Mass Rapid Transit is a critical

piece of infrastructure and will help enable other improvements across the A414 Corridor.



It is important to note that many of the interventions put forward in this Corridor Strategy are concepts. Looking ahead, there will need to be a process of assessing proposals in more detail using existing or new evidence tools including transport models. This will help to refine and validate proposals to make sure they will work and deliver benefits.

Furthermore, if circumstances change, for example key housing and employment developments do not come forward as planned, or other priorities emerge, a review of the Corridor Strategy or specific Segments may lead to a potential change to proposed Interventions and Packages.

If supported and approved, interventions will be adopted by Hertfordshire County Council, alongside partner authorities, and entered into their established ranking processes and forward programme of works, as well as Local Planning Authorities' IDPs. This will prioritise interventions and confirm if/when more detailed work needs to be carried out in order to eventually implement interventions.

Not until more detailed investigations are completed which will involve engagement with communities and stakeholders on a case-by-case basis will interventions be implemented on the ground.

In many cases, these will need detailed business cases to be developed that assess overall value for money and wider impacts.

Continual recognition and monitoring of potential funding opportunities is critical. Local Authorities are increasingly reliant on making bids to funding competitions often promoted by Central Government. It is important therefore that a robust case can be put forward for successfully obtaining funds. The availability of sufficient funding will play a crucial role in the implementation of proposals put forward.

How much will it cost?

Many of the interventions identified in this Corridor Strategy are concepts and will require more detailed investigation and design. It is therefore only possible at this stage to provide indicative cost ranges. To provide an indicative guide to potential implementation costs per intervention, intervention package and cumulatively across the whole corridor, the following capital cost range estimates have been defined unless more accurate estimates are available:

- Less than £0.5 million
- £0.5 million - £1 million
- £1 million - £2.5 million
- £2.5 million - £5 million
- £5 million - £10 million
- £10 million - £50 million
- £50 million - £100 million
- £100 million +

It is acknowledged these cost ranges are quite large, which is typical at this stage of assessment given the uncertainty on design, risks, and interactions with existing transport and non-transport infrastructure and land use. More definitive cost estimates

Because the form of the Mass Rapid Transit is not yet decided and is subject to detailed study, a cost estimate for this intervention cannot be made at this time. An express bus and tram system could be very different in terms of how much they cost to build and operate. Similarly because it is not yet determined whether Package 24—Hertford Strategic Intervention—is needed, a cost estimate for this intervention cannot be made at this time either.

This Corridor Strategy concentrates on capital costs estimates. It is acknowledged that interventions will require maintenance over a period of time following delivery and some may require additional revenue support to operate. Such cost estimates will be estimated for interventions that are developed in more detail and taken forward in business cases that assess overall lifetime value for money.

The following capital cost range has been estimated for each of the packages. The minimum cost has been set at £50,000.

When will interventions be delivered?

Further work on a separate Implementation Plan is currently underway. This Implementation Plan will provide more information on delivery timescales and potential funding sources.

More up to date information on the cost, funding and delivery of Interventions and Packages will be provided in the separate A414 Corridor Strategy Implementation Plan.

Package cost range estimates

These are indicative cost range estimates for each package. If interventions are taken forward, they will be developed in more detail and therefore the cost estimates will be refined and the range between upper and lower estimates mostly likely narrowed.

In such cases, it is usual for an order of magnitude cost estimate to be produced for an intervention in the first instance, and for this to be refined as the scheme is designed and developed further, together with a costed quantified risk assessment.

These cost range estimates will be revised in the annexes if/when work progresses on the proposed packages

Package	Indicative cost range estimate
1	£77M - £215M
2	£50M - £192M
3	£2M - £5M
4	£101M - £503M
5	£5M - £10M
6	£1M - £2M
7	£7M - £15M
8	£2M - £5M
9	£1M - £3M
10	£4M - £9M
11	£7M - £16M
12	£8M - £18M
13	£4M - £9M
14	£14M - £31M
15	£7M - £16M
16	£7M - £17M
17	£5M - £13M
18	£4M - £11M
19	£8M- £18M
20	£4M - £9M
21	£12M - £56M
22	£3M - £8M
23	£6M - £13M
24	To be determined
25	£25M
26	£14M - £16M
27	£46M
28	£41M
29	£13M
30	£53M - £105M
MRT	To be determined

Acronyms

AQMA	Air Quality Management Area
BRE	Building Research Establishment
CC	County Council
CIL	Community Infrastructure Levy
COMET	County Council Transport Model
DfT	Department for Transport
EV	Electric Vehicle
EZ	Enterprise Zone
GTP	Growth and Transport Plan
HCC	Hertfordshire County Council
HE	Highways England
HGV	Heavy Goods Vehicle
IDP	Infrastructure Delivery Plan
LPA	Local Planning Authority
LEP	Local Enterprise Partnership
LHA	Local Highway Authority
LRN	Local Road Network
LTP	Local Transport Plan
LGF	Local Growth Fund
LSTF	Local Sustainable Transport Fund
MHCLG	Ministry of Housing, Communities and Local Government
MRN	Major Road Network
MRT	Mass Rapid Transit
NCN	National Cycle Network
PRN	Primary Route Network
PT	Public Transport
SEP	Strategic Economic Plan
SRN	Strategic Road Network
S106	Section 106 agreement (Town and Country Planning Act 1990)
TfL	Transport for London

Glossary

A

Accessibility
Enabling people to access key services at a reasonable cost, in reasonable time and with reasonable ease.

Active Travel
Journeys undertaken by physically active means such as walking or cycling.

Air Pollution
A substance which has harmful or poisonous effects which has been released into the air.

Air Quality Management Area (AQMA)
Through the Local Air Quality Management system, local authorities are required to assess air quality and carry out reviews. Local authorities must measure air pollution with the aim of making sure that the national air quality objectives are achieved to protect people's health and the environment. If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area.

Asset Management
The approach used to prioritise road maintenance work.

Autonomous Vehicles
A vehicle (including cars, vans, lorries or similar vehicles also known as a driverless cars, self-driving car and robotic cars) that is capable of sensing its environment and navigating without human input.

B

Behaviour Change
A transformation or modification of human behaviour.

Biodiversity
The variety of plant and animal life in a particular habitat which is usually considered to be important and desirable.

Brownfield
Urban sites with the potential for development which has previously been built on or used for development.

Bus Priority
Various techniques and measures aimed to reduce journey times and improve the reliability of bus services including; lane segregation, traffic management, traffic signal control and bus stop improvements.

Bus Rapid Transit
A good quality, high capacity passenger transport system.

Bypass
A road passing round a town or its centre to provide an alternative route for through traffic.

C

Carbon Emissions
The release of carbon into the atmosphere which can cause damage to the environment

Community Infrastructure Levy (CIL)
A planning charge, introduced by the Planning Act 2008 as a tool for local authorities in England and Wales to help deliver infrastructure to support the development of their area.

Community Rail Partnerships
The support of railway lines and stations by local organisations comprising railway operators, local councils, and other community organisations, and rail user groups.

Congestion
Road congestion occurs when an additional vehicle on the network impacts on the journey time of all other vehicles using the network at that time.

Connected Autonomous Vehicles
Autonomous or driverless vehicles are connected through mobile data networks and other dedicated communications protocols that facilitate interactions with other vehicles, other devices or machines or with infrastructure.

Connectivity
Enabling better connections within and between places and different modes of transport, thereby minimising gaps in the transport system and improving choices.

Crossrail 2
A newly proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

Cycle Infrastructure Improvement Towns
Towns where the Propensity to Cycle Tool has identified the most heavily used cycle routes in the future.

D

Demand Management
The application of strategies, interventions and policies aimed to reduce travel demand or to redistribute this demand.

Demand Responsive Transport
An advanced form of shared passenger transport which has flexible routing and scheduling of small to medium sized vehicles operating in according to passengers' needs and demand.

Department for Transport
The government department works with agencies and partners to support the transport network that helps UK businesses and gets people and goods travelling around the country. The department plans and invest in transport infrastructure to keep the UK on the move.

Deprivation
The damaging lack of material benefits considered to be basic necessities in a society.

E

Economic Growth
The increase in the amount of goods and services produced per head of the population.

Enterprise Zone
Enterprise Zones are part of the Government's wider Industrial Strategy to support businesses and enable local economic growth by offering businesses incentives such as tax incentives to encourage investment and growth.

G

Greenbelt
Green Belts were made possible by the Town and Country Planning Act 1947 referring to an area that is kept in reserve for an open space, most often around larger cities to prevent the urban sprawl and help protect agricultural activities and the unique character of rural communities. The Metropolitan Greenbelt refers to the statutory greenbelt around London which compromises parts of greater London and six surrounding counties including Hertfordshire.

Greenfield
Greenfield land is undeveloped land in a city or rural area either used for agriculture or

landscape design, or left to evolve naturally. These areas of land are usually agricultural or amenity properties being considered for urban development.

Growth and Transport Plans

Growth and Transport Plans (GTPs) cover different sub areas of Hertfordshire and consider current and future challenges and identify interventions aligned to LTP objectives.

H

Habitats Regulation Assessment

The Planning Act 2008 local authorities have a legal obligation to consider impacts which might have an adverse effect to protected habitats. The assessment identifies any aspects of the A414 Corridor Strategy that would have the potential to cause a likely significant effect on Natura 2000, European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites).

Hamburger Junction

A signalised roundabout where the main route dissects the centre of the roundabout.

Heavy Goods Vehicles (HGVs)

A commercial vehicle also known as large goods vehicle (LGV) with a gross vehicle weight of over 3.5 tonnes.

High Speed 2 (HS2)

A planned high-speed railway in the United Kingdom, directly linking London, Birmingham, the East Midlands, Leeds and Manchester.

Highway

Under the Highways Act 1980, a local highways authority has a duty of care to maintain the safety and usability of public roads. A highway is a way over which all members of the public have the right to pass and repass. Their use of the way must be as of right, not on sufferance or by licence. Hertfordshire County Council is the Highway Authority for all highways within the County other than trunk roads and motorways, which are the responsibility of the Department for Transport and Highways England.

Highways England

Highways England operates, maintains and improves England's motorways and major A roads.

I

Implementation Plan

A plan which describes how the strategy and policies will be delivered.

Intelligent Transport Systems

The use of technology to improve safety, efficiency, environmental performance and the journey experience for transport users.

Inter-urban

Connecting cities or towns.

Intra-urban

Within an urban area.

L

Land Use Planning

The future planning of housing and development of land.

Light Goods Vehicles (LGVs)

A commercial carrier vehicle with a gross vehicle weight of not more than 3.5 tonnes i.e. commercial van.

Local Enterprise Partnership (LEP)

A voluntary partnership between local authorities and businesses which help determine local economic priorities and lead economic growth and job creation. The Hertfordshire LEP maintains a pipeline of projects which support the delivery of their

Strategic Economic Plan (SEP) https://www.hertfordshirelep.com/.

Local Governance
The system of Local Authorities electing representatives to be responsible for a range of vital public services for people and businesses in defined areas.

Local Highway Authority
A local highway authority is an organisation that is responsible for the maintenance of public roads. The current role of a highway authority is defined in the Highways Act 1980 and the role is held by a large number of different groups. Hertfordshire County Council is the local highway authority in Hertfordshire.

Local Sustainable Transport Fund
Funding made available through the Department of Transport which helped local authorities to deliver sustainable transport projects that support economic growth.

Local Plan
A local plan sets out local planning policies and identifies how land is used, determining what will be built where. Adopted Local Plans provide the framework for development across England. Local Plans are typically prepared by the Local Planning Authorities, including district/borough authorities and unitary authorities.

Local Planning Authority
A local planning authority (LPA) is the local government body that is empowered by law to exercise urban planning functions for a particular area. In Hertfordshire the districts and boroughs are the Local Planning Authorities.

Local Transport Plan
The Transport Act 2000 introduced a statutory requirement for local transport authorities to produce a Local Transport Plan (LTP) every five years and to keep it under review. The plan sets out the statutory framework and policies on how transport can help deliver a positive future vision by considering safe and efficient travel while supporting economic growth, meeting housing needs, improving public health and reducing environmental damage. The plan also considers how future planning decisions and emerging technology might affect the way transport needs to be provided in the longer term.

M

Mass Rapid Transit
A public transport service including bus, tram or similar which carries multiple passengers on a prioritised route. A bus rapid transit is a form of Mass Rapid Transit.

Modal Shift
The transfer of people from one means of transport to another for regular journeys, e.g. a car driver deciding to take a bus to travel to work.

Multi Modal
The occurrence of several different forms of travel activity, including car, bus, cycle and pedestrians.

Multi Modal Transport Interchange
An interchange in the form of a station or stop between one mode of any type of transport and another, for example between bus and train. It also considers interchange between public transport and the feeder modes used to get to and from the interchange for example walk, cycle or car.

N

National Planning Policy Framework
The National Planning Policy Framework sets out government's planning policies for England and how these are expected to be applied. The NPPF draft policy paper can be found by visiting https://www.gov.uk/government/publications/national-planning-policy-framework--2.

Network Management
Enabling the highway to perform its primary function of moving people and goods.

Network Rail
Owns and operates the railway infrastructure in England, Wales and Scotland on

behalf of the nation.

O

Open Data
The sharing of data by making data freely available, easy to access and, be re-used, built on and redistributed by anyone.

P

Passenger Transport
Passenger transport refers to transport available for use by the general public including bus, coach, rail and taxi.

Performance Indicator
A type of performance measurement which will be used to monitor the progress and effectiveness of the Local Transport Plan.

Primary Route Network (PRN)
The primary route network designates roads between places of traffic importance across the UK, with the aim of providing easily identifiable routes to access the whole of the country.

Public Realm
Space around, between and within buildings that are publicly accessible, including streets, squares, parks and open spaces.

Public Rights of Way
Public Rights of Way are all minor highways and give people the legal right to pass and re-pass along a specific route through grounds or property (often belonging to another), including: Footpaths – a right to pass on foot only, usually encompassing wheelchair users, mobility buggies, and with dogs, pushchairs, etc.; Bridleways – a right to pass on foot, horseback or leading a horse and, since 1968, a right for bicycles provided they give way to other users; Restricted Byways – a public right of way on foot, on horseback or leading a horse, and for vehicles other than mechanically propelled vehicles (such as horse-drawn carriages and pedal cycles); Byways Open to All Traffic – a highway over which the public have a right of way for vehicular and all other kinds of traffic, but which is used by the public mainly for the purpose for which footpaths and bridleways are so used.

R

Rat Running
Motorists using alternative and potentially inappropriate roads to avoid traffic congestion elsewhere.

Real Time Information
An information system which tracks buses and trains to provide live arrival and departures times and display these on digital information boards or smart devices.

S

Section 106
A legal agreement between an applicant seeking planning permission and the local planning authority used to mitigate the impact of new developments on the local community and infrastructure.

Shared Mobility
A transport strategy which encourages the shared used of a vehicle, bicycle, or other transportation mode.

Shared Space
An urban design and planning approach that seeks to minimise the segregation between different users of the highway. This can be done by removing features such as kerbs, road surface markings, traffic signs and traffic lights.

Sharing Economy
A trend which is shifting the conventional ownership model of purchasing vehicles and private transport to sharing transport services for example car clubs, bike sharing, lift sharing and on demand transport.

Sites of Special Scientific Interest (SSSI's)
Sites protected by law to conserve their wildlife or geology.

Smarter Choices
A collective title for a range of measures that can encourage reduced car use which can include all forms of travel planning, information provision, marketing, car sharing, tele conferencing and home working.

Socio-economic
The interaction of social and economic factors.

Social Exclusion
Social exclusion is a complex and multi-dimensional process. It involves the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in a society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole.

Spine Road
A main road connecting different parts of an urban area.

Strategic Environmental Assessment (SEA)
A report required by the European Union and implemented through the Environmental Assessment of Plans and Programmes Regulations 2004 which explaining the possible environmental impacts of the A414 Corridor Strategy.

Strategic Road Network
The highway network made up of motorways and trunk roads, the most significant 'A' roads, managed by Highways England.

Supporting Documents
Documents covering a particular topic area and supports the Local Transport Plan's policies and objectives and include packages of smaller schemes and activities. This includes Growth and Transport Plans.

Sustainable Transport
Sustainable transport refers to transport that is socially, environmentally and economically sustainable and supports the source of an indefinite supply of energy (e.g. walking and cycling).

Sustainable Travel Town
Sustainable Travel Towns are about making a significant change to travel within an urban area, encouraging intra-urban journeys over inter-urban ones, and increasing the levels of walking and cycling.

T

Transport Corridor
A grouping of transport routes including roads, railways, footpaths, cycle routes, bus services within or between urban areas.

Transport User Hierarchy
Policy which presents a shift in emphasis to increase rates of travel by more sustainable modes by increasing the attractiveness of alternative forms of travel so that those trips that can only feasibly be made by the car can be undertaken without suffering the effects of a significant worsening of congestion.

Travel Plans
Travel Plans are a way of assessing and mitigating the negative transport impacts of development in order to promote sustainable development.

U

Ultra-Low Emission Vehicles (ULEVs)
Vehicle that use low carbon technologies, emits less than 75g of CO2/km from the tailpipe and/or is capable of operating in zero tailpipe emission mode for a range of at least ten miles.

Annexes

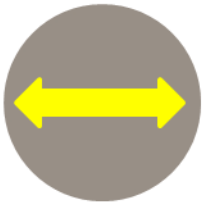
Segment Priorities Outline

Segment 1 Hemel Hempstead
Segment 2 Hemel Hempstead-St Albans-Park Street
Segment 3 Watford-Garston
Segment 4 Bricket Wood Triangle
Segment 5 Park Street-How Wood-Chiswell Green
Segment 6 Park Street-St Albans-London Colney
Segment 7 St Albans-London Colney-Hatfield
Segment 8 Hatfield
Segment 9 Welwyn Garden City-Hatfield
Segment 10 Hatfield-Welwyn Garden City-Hertford
Segment 11 Hertford
Segment 12 Hertford-Rush Green
Segment 13 Broxbourne Towns
Segment 14 A10-Harlow

(15) Mass Rapid Transit Vision and Options
(16) Sifting and Packaging
(17) Place and Movement Assessment

Key Priorities — by theme

Local Urban Connectivity
Prioritised connections within towns for short distance trips



Strategic Inter-Urban Connectivity
Prioritised connections for longer distance trips with a focus on journey time reliability

Rail Feeder Access
Prioritising access to train stations to facilitate better access to other parts of Hertfordshire, Greater London and beyond

Logistics Accessibility
Provide safe and efficient access for logistics to travel to key hubs on the most appropriate roads.

Inter-urban Non-Car Connectivity
New and improved mass transit and cycling routes for town-to-town trips to make these a viable and attractive alternative to the car

Enhanced Place Function
Protection and enhancement of key urban areas, including preserving heritage and the unique character of places

Mode Equality
Recognising the complexities of the transport network, managing the needs of a mixture of modes and ensure routes are used in the most appropriate and efficient way for the benefit of all

Active Travel Priority
Priority given to pedestrians and cyclists at key junctions, along routes and across neighbourhoods, to encourage healthy and safe journeys

Technology Focus
Using advanced, innovative technology to deliver benefits to the transport network, to improve efficiency and enable more joined up journeys.

Segments

Segment 1 Hemel Hempstead
Segment 2 Hemel Hempstead-St Albans-Park Street
Segment 3 Watford-Garston
Segment 4 Bricket Wood Triangle
Segment 5 Park Street-How Wood-Chiswell Green
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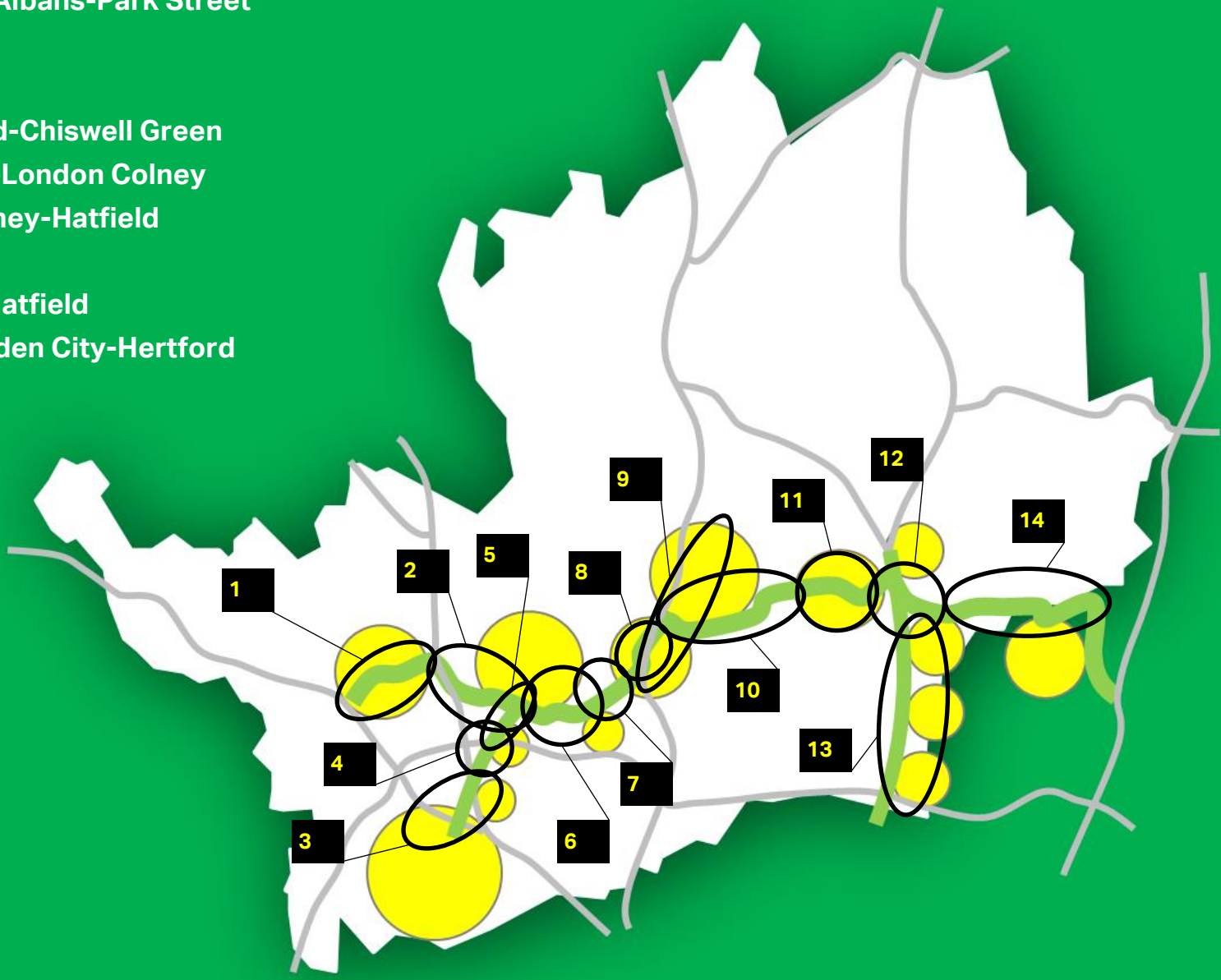
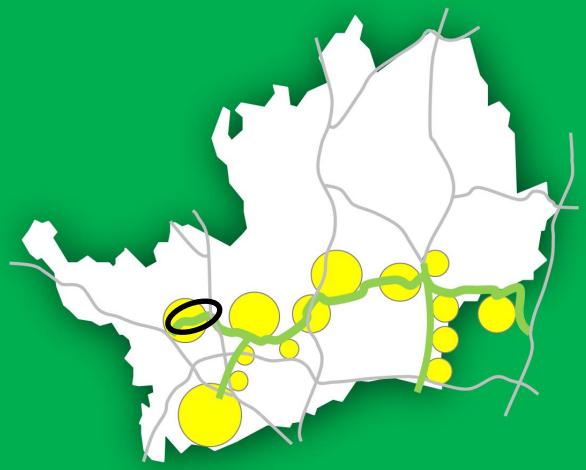


A414 Corridor
Segment



1

Hemel Hempstead

Segment 1: Hemel Hempstead

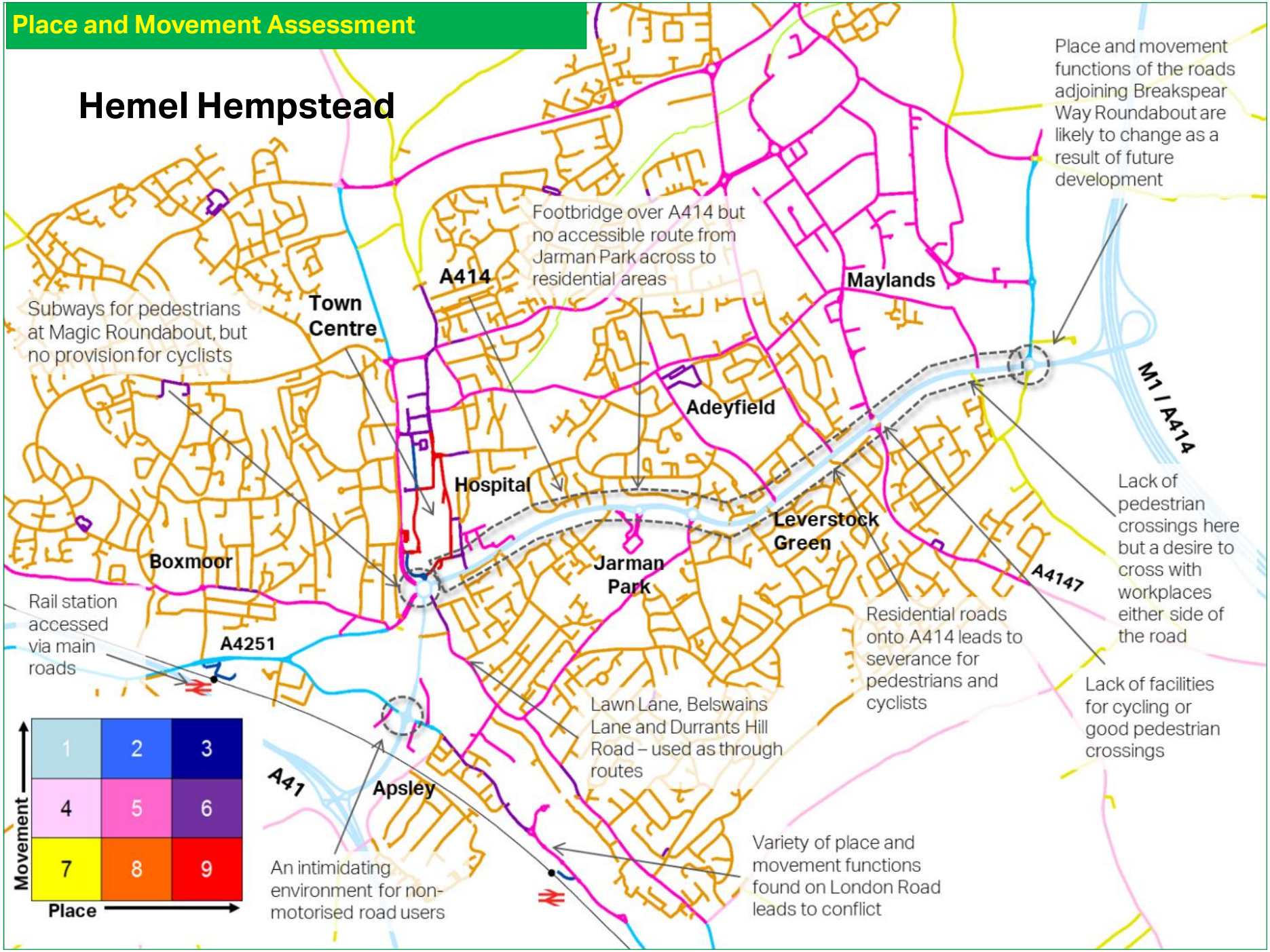
The town of Hemel Hempstead lies at the western end of the corridor and is dissected by the A414 which is formed (mostly) of a high speed dual carriageway. The town is a major urban centre for retail, employment and key services. The town has two railway stations, both of which are located on the western side of the town. Hemel Hempstead station in particular is situated away from the main built up area of the town.

The evidence analysis identified Hemel Hempstead as a segment in its own right, with a mixture of local, shorter distance trips, and longer distance trips occurring both on the A414 and adjoining and parallel routes including the A4147 (which links towards St Albans). A summary of the key characteristics and challenges in this segment are shown in the table to the right.

A number of medium to large scale housing-led developments are already proposed in this segment which are identified in Dacorum Borough Council's Core Strategy, its emerging 2036 Local Plan and St Albans City and District's emerging Local Plan. Large developments are mainly concentrated to the north and east of the town. The Maylands business park is also a major focus for economic growth and forms part of the strategic Hertfordshire IQ Enterprise Zone.

This remainder of this Annex describes the priorities for this segment and details of the packages of proposed interventions.

Segment 1 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 61%	Medium (5-15km) 18%	Short (0-5km) 21%
Key Infrastructure and Services	**Highway** • A414 runs through town centre, mostly as dual carriageway. Junctions tend to be un-signalised roundabouts.		
	Public Transport • Main station has regular services to London at peak times. Services to London from Apsley station are less frequent. • Bus route 4, 2 and 3 run exclusively within town while bus routes 301, 300 and 500 also connect other towns.		
	Walking/Cycling • The Nickey Line cycle route runs between Hemel Hempstead and Harpenden via Redbourn. An off-road cycle path also runs towards Watford along the River Gade. • Local cycle paths can be found in the north of the town and the Grand Union Canal Towpath provides a north-south connection in the west of the town.		
Segment Challenges	**Highway Issues** • Two AQMAs in the Frogmore End. • Delays during peak times at several junctions e.g. A4251/A414. • A414 through town constrains highway boundary expansion. • A414 is used for both intra-urban and through trips. • Several junctions are HCC defined hazardous sites.		
	Public Transport Issues • Poor connectivity between town centre and residential areas, particularly towards Maylands. • Rail station located out of town which could impact usage • Connectivity from Eastern St Albans to Hemel Hempstead is significantly lower than from Western/Central parts of St Albans.		
	Walking/Cycling Issues • Discontinuous cycle path provisions, particularly between northern and southern sections of town. • Hilly topography may discourage some cyclists. • No direct cycle route to St Albans. • Cycle commuting rates are low along off-road route to Watford.		

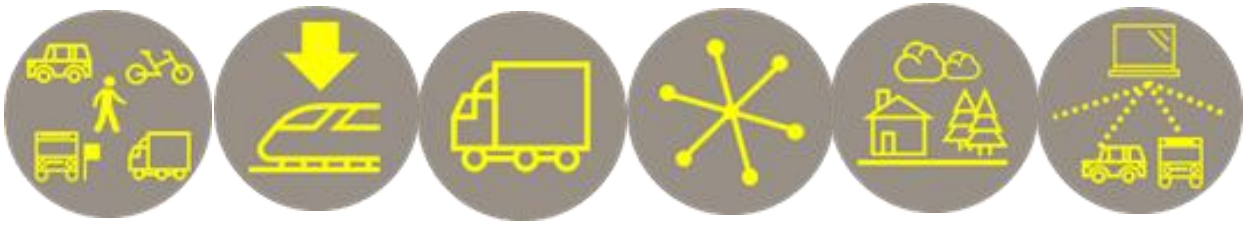

Hemel Hempstead
Place and movement functions of the roads adjoining Breakspear Way Roundabout are likely to change as a result of future development
Footbridge over A414 but no accessible route from Jarman Park across to residential areas
Subways for pedestrians at Magic Roundabout, but no provision for cyclists
A414
Town Centre
Maylands
Adeyfield
M1 / A414
Hospital
Leverstock Green
Boxmoor
Jarman Park
A4147
Lack of pedestrian crossings here but a desire to cross with workplaces either side of the road
Rail station accessed via main roads
A4251
Residential roads onto A414 leads to severance for pedestrians and cyclists
Lack of facilities for cycling or good pedestrian crossings
Lawn Lane, Belswains Lane and Durrants Hill Road – used as through routes
A41
Apsley
Movement
Place
1
2
3
4
5
6
7
8
9
An intimidating environment for non-motorised road users
Variety of place and movement functions found on London Road leads to conflict

Segment 1: Hemel Hempstead

Segment 1 Priorities

An urban transport and travel network within Hemel Hempstead which facilitates local journeys by sustainable modes and key gateway links which maintain connectivity to more strategic routes including the West Coast Main Line and M1 motorway by all modes of travel.

- A new northern distributor road provides some relief on the A414 through Hemel Hempstead, enabling an improvement in connectivity for pedestrians, cyclists and public transport services travelling along and across the A414 within the town, with the objective of increasing the sense of place.
- Improve public transport connections between Hemel Hempstead railway station, town centre, Jarman Park and Maylands/East Hemel Hempstead urban extension, utilising priority infrastructure along the A414 corridor.
- Provide a new multi-modal transport interchange within Maylands/East Hemel Hempstead urban extension to facilitate easy transfer between local and more strategic mass transit services as well as facilities for cycling.
- The section of the A414 between Green Lane and M1 Junction 8 should continue to facilitate the movement of traffic with a focus on providing access to Maylands including logistics traffic. This should not however be at the expense of people travelling on foot, by bike or by public transport therefore suitable and attractive provision should be made for these means of travel.
- Help facilitate innovative transport and digital technologies in and around the Hertfordshire IQ Enterprise Zone.



Segment 1: Hemel Hempstead

Packages Overview

Package 1 - Hemel Hempstead East-West Corridor

(broadly consistent with Package 1 in the draft South West Hertfordshire Growth and Transport Plan)

The overarching aim of Package 1 is:

To form an east-west, cross-town corridor which facilitates attractive and convenient journeys on foot, by bike, by bus and also by car between Hemel Hempstead railway station, the Town Centre, Jarman Park and Maylands industrial area.

The package consists of:

- Developing the A414 into a public transport and cycling/walking corridor, improving both connectivity along and across the key route.
- Improving access to the M1 through the provision of an additional junction and enhancements to Hemel's existing junction.
- Core cycle network across Hemel Hempstead to tie key destinations together including the town centre, Maylands and railway stations

The table below/overleaf summarises the interventions in this package.

A414 Package 1 - Hemel Hempstead East-West Corridor		
Name	**Short Description**	**Estimated Cost Range**
Two Waters-A4251 London Road crossroads simplification	Improvements to the pedestrian and cycling facilities at the A4251/A414 crossroads in Two Waters to improve station access and discourage through trips along the A4251.	£500k - £1m
Various cycle routes crossing A414, including at-grade crossings	New cycle routes mainly on roads which cross the A414 including: Wood Crescent/Runham Rd (incl. link to ski centre); Lower Yott/Windmill Road; Jarman Park; Bennetts End Rd, White Hart Rd, Longlands (incl. link to Adeyfield shops; Leverstock Green Road). New at-grade crossings on the A414 will be required. Provide linkages to urban centres such as Adeyfield and Bennetts End.	£2.5m - £5m
Northern Hemel Hempstead Distributor Road	A distributor road across the north of Hemel Hempstead between B487Redbourn Road and B440 Leighton Buzzard Road to help distribute proposed development traffic across the town which could facilitate changes on the A414.	£50m - £100m

Package continued overleaf

Segment 1: Hemel Hempstead

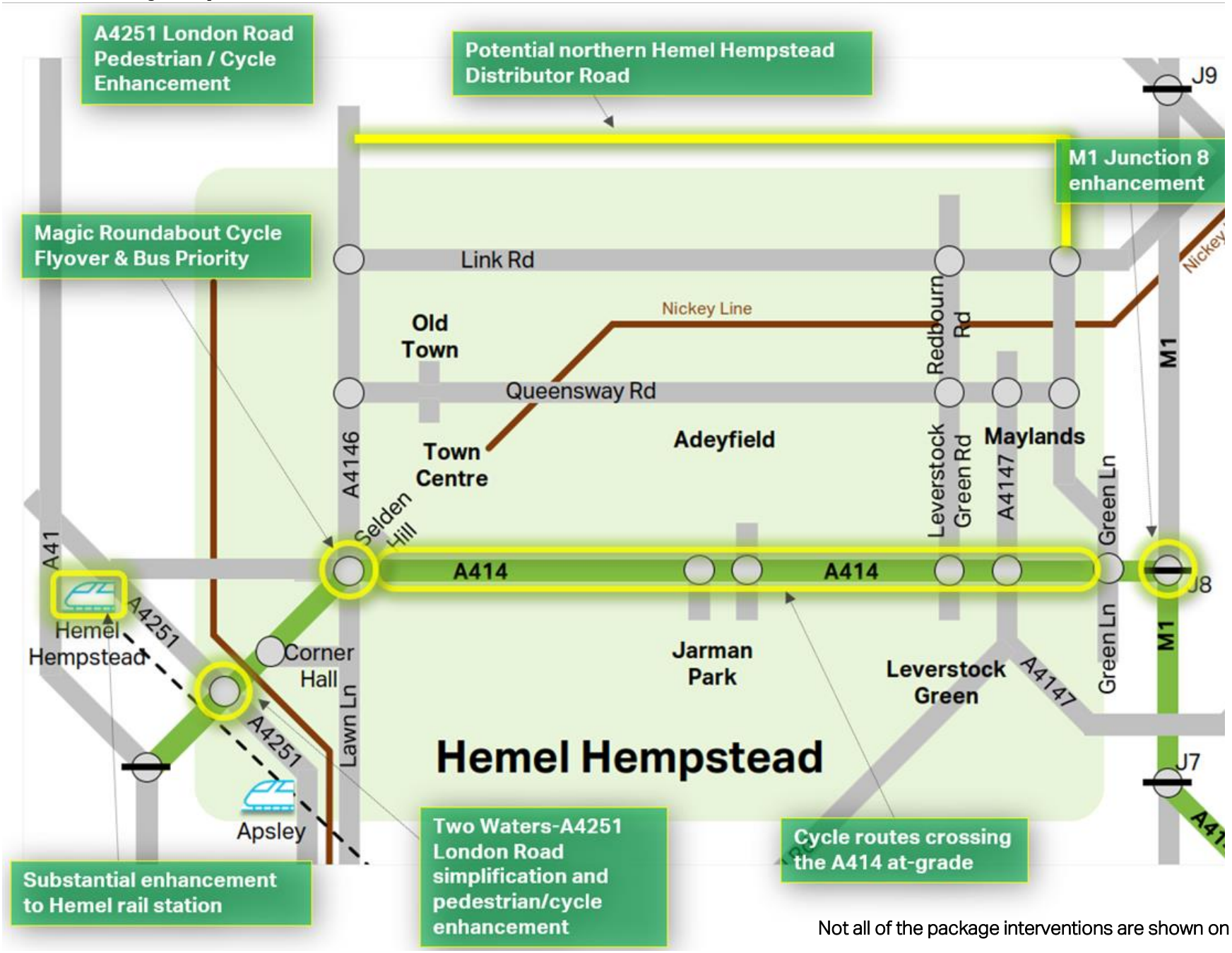
A414 Package 1 (continued)		
Name	**Short Description**	**Estimated Cost Range**
M1 Junction 8 enhancement	Enhancement to M1 Junction 8 to provide additional capacity and connectivity to Maylands, and relieve congestion on the A414.	£10m - £50m
A4251 London Road pedestrian / cycle enhancement	Pedestrian and cycle enhancements along London Road (A4251) to enhance safety and encourage walking and cycling. Include cycle lanes and wider footways with the intention of promoting healthier methods of travel through the Two Waters area of the town.	£50k - £500k
Magic Roundabout Cycle Flyover	A flyover bridge, iconic in design, primarily to facilitate cycling over the Magic Roundabout.	£2.5m - £5m
Magic Roundabout Bus Priority	Bus priority lanes and traffic signalling on the Magic Roundabout to improve bus and Mass Rapid Transit service journey times and reliability between Hemel Hempstead station and the eastern part of the town including Maylands.	£1m - £2.5m
Substantial enhancement to Hemel Hempstead Station	Substantial enhancement to Hemel Hempstead station at its existing location - forecourt, access enhancements, new south-eastern platform access and parallel footway to Two Waters Road and Boxmoor.	£10m - £50m
Hemel Hempstead town-wide bus service reconfiguration	A study to identify potential reconfiguration of bus services throughout Hemel Hempstead to provide efficient routes across the town with the aim of maximising connections to Maylands, the station, town centre and east-west links to neighbouring towns. The study should consider opportunities for Demand Responsive Transport.	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK1	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£77m - £215m**

A map showing broad locations of the above interventions is presented on the next page.

Package 1 - summary map



Not all of the package interventions are shown on this map

Segment 1: Hemel Hempstead

Packages Overview

Package 2 - Maylands and East Hemel Hempstead

(broadly consistent with Package 2 in the draft South West Hertfordshire Growth and Transport Plan)

The overarching aim of Package 2 is:

To provide improved access to the Maylands Hertfordshire IQ Enterprise Zone and the wider East Hemel Hempstead Garden Community from within and Hemel Hempstead by all modes of travel.

The package consists of:

- The introduction of an East Hemel Multi-Modal Transport Interchange serving the Maylands and Enterprise Zone developments.
- Improving access to the M1 through the provision of an additional junction and enhancements to Hemel's existing junction.
- A new spine road serving East Hemel Hempstead urban extension and Maylands alongside a series of cycling improvements to improve connectivity across the proposed developments.

The table below/overleaf summarises the interventions in this package.

A414 Package 2 - Maylands and East Hemel Hempstead		
Name	**Short Description**	**Estimated Cost Range**
M1 Junction 8 enhancement	Enhancement to M1 Junction 8 to provide additional capacity and connectivity to Maylands, and relieve congestion on the A414.	£10m - £50m
A414 J8 Cycle Bridge	A bridge over the A414 Breakspear Way near M1 Junction 8, to improve cycle routes to areas north and south of the A414, linking development. Designed to be iconic in style and high quality to attract users.	£10m - £50m
Wood End Lane - Boundary Way Link	A new development-led link road between Wood End Lane and Boundary Way to facilitate partial closure of Buncefield Lane to through traffic and to provide access to the Maylands Gateway development.	£500k - £1m
Pedestrian and Cyclists Crossings	New / improved pedestrian and cyclist crossing facilities at key locations to address existing severance and enhance access to the Maylands area from surrounding residential areas.	£50k - £500k

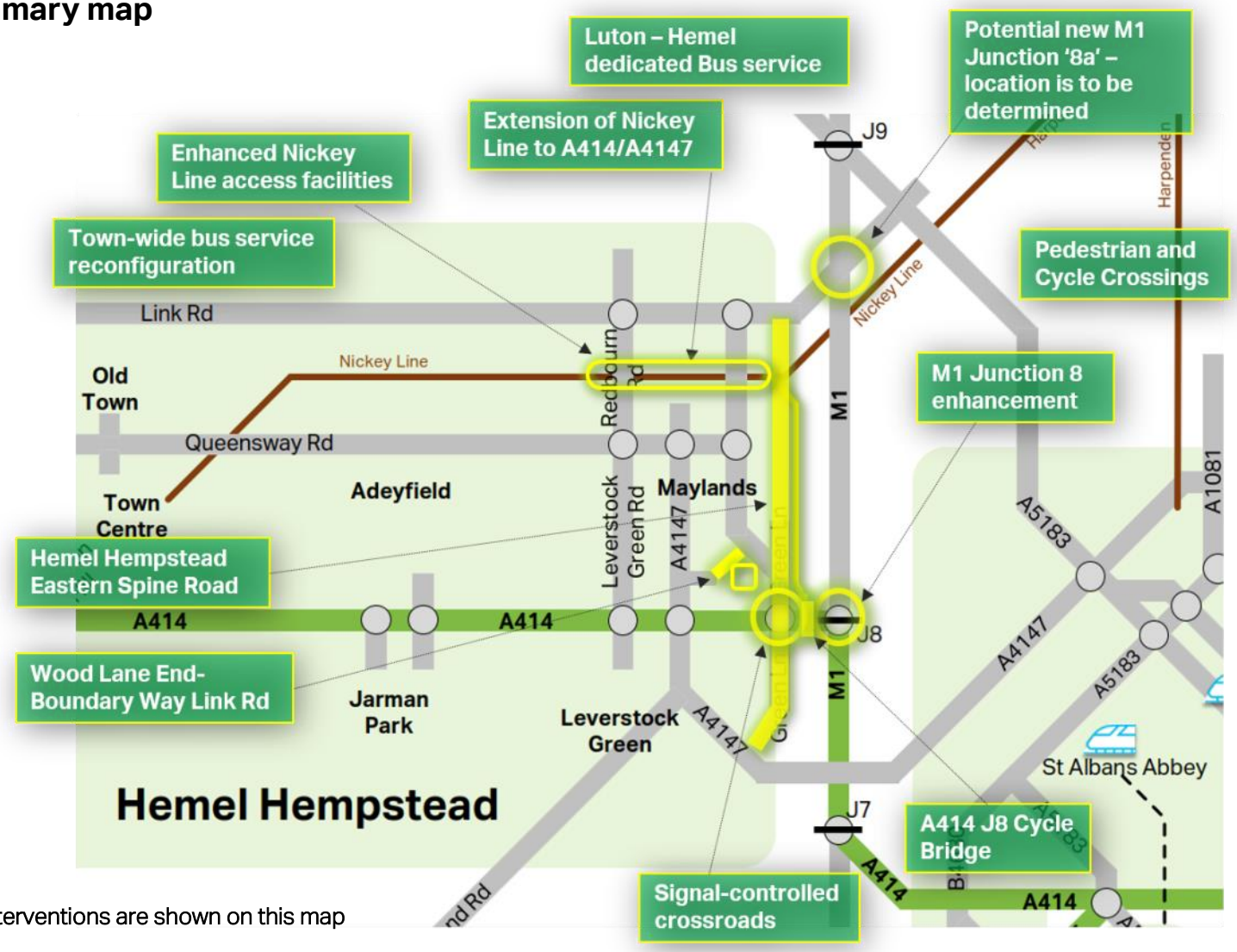
Continued overleaf

A414 Package 2 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Hemel Hempstead Eastern Spine Road	A mostly single carriageway, lower speed Eastern Spine Road that connects A4147 and B487 to enhance connections and access to Maylands by car, bus and cycle from the north. Connects Green Lane to B487 and into other cycle routes in Maylands. Designed to minimise traffic rat-running.	£2.5m - £5m
M1 Junction 8a (additional junction)	Provision of an additional M1 Junction 8a in conjunction with enhanced links to Maylands/East Hemel Hempstead and potential future development around Hemel Hempstead as part of the emerging Garden Communities proposal.	£10m - £50m
Hemel Hempstead town-wide bus service reconfiguration	A study to identify potential reconfiguration of bus services throughout Hemel Hempstead to provide efficient routes across the town with the aim of maximising connections to Maylands, the station, town centre and east-west links to neighbouring towns.	£50k - £500k
M1 dedicated coach service connecting Luton and Hemel Hempstead (or Greenline 757 diversion)	A new express coach service along the M1 connecting Hemel Hempstead to Luton or potential to divert existing Greenline services from Luton to London via Hemel Hempstead (Maylands).	£2.5m - £5m
Nickey Line Extension	A 'branchline' of the Nickey Line cycle route through the proposed East Hemel Hempstead development linking into the A414/A4147 corridors.	£1m - £2.5m
Maylands Multi Modal Transport Interchange and associated infrastructure	A bus and coach interchange near to Maylands with access to the A414/M1. Served by existing or new express coach services along M1. Potential for bus shuttle links to the whole Maylands area.	£5m - £10m
Conversion of country lanes through Maylands into quietways for cyclists and pedestrians	Conversion of existing 'country lanes' through the Maylands area to quietways for cyclists and pedestrians travelling from north and south Hemel Hempstead into Maylands.	£2.5m - £5m
Enhance Nickey Line, Replace steps with ramp	Enhance the Nickey Line cycle path by providing additional lighting to improve perception of safety, improve signage to make navigation easier day and night. To cover both the urban section within Hemel Hempstead and the rural section to Redbourn. Replacement of current steep steps with a ramp structure suitable for cyclists and mobility impaired people.	£1m - £2.5m
A414 Breakspear Way/Green Lane crossroads	A414 Breakspear Way/Green Lane signalised crossroads including pedestrian/cycle bridge, form part of the cycle track branch off the Nickey Line to the north, and will connect to a new off-road cycle track alongside the A4147 to St Albans.	£5m - £10m

The following table presents an indicative cost range estimate for this package. Please see Section 11 of the A414 Corridor Strategy regarding what the costs represent and how they are likely to change and be refined once more detailed work is undertaken to develop the interventions.

PK2	TOTAL INDICATIVE COST RANGE ESTIMATE	£50m - £192m

Package 2 - summary map



Not all of the package interventions are shown on this map

Segment 1 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

For Hemel Hempstead, further opportunities could be mainly focused around facilitating innovative transport and digital technologies for the Hertfordshire IQ Enterprise Zone. This could focus around proposals for the Maylands Multi Modal Transport Interchange, as well as other opportunities to develop innovative and emerging forms of transport in line with the strategic vision of the Enterprise Zone. A Mass Rapid Transit System will likely feed into these emerging ideas.

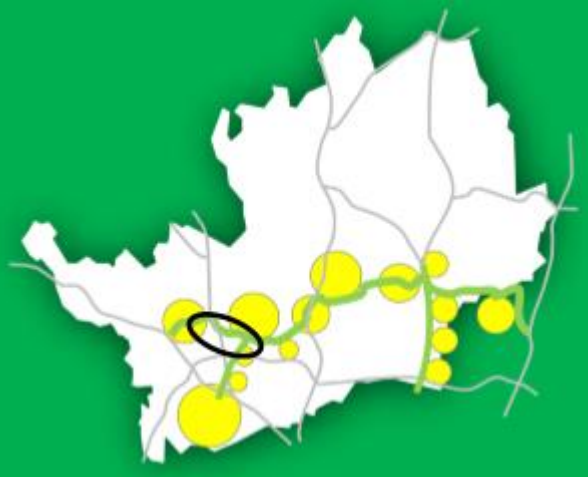
The build-out of the full emerging Hemel Hempstead Garden Communities masterplan will have a significant influence on transport and travel across the town and the wider area. This strategy has identified a potential need for a northern link road primarily to serve a potential northern Garden Community but also to facilitate improvements in pedestrian, cyclist and public transport facilities across the town, including the existing A414 route.

Further investigations will be required to determine the impact and feasibility of many changes to the current A414 dual carriageway through Hemel Hempstead such as the conversion of lanes to bus priority lanes. If as a consequence of this, traffic re-routes onto surrounding roads, further measures may be required to help minimise the impact of traffic re-routing onto less appropriate roads such as residential streets.

In the future, a northern link road could potentially serve a strategic purpose to the north of the town by replacing the existing A414 in linking the A41 and M1. This would however require more thorough investigations.

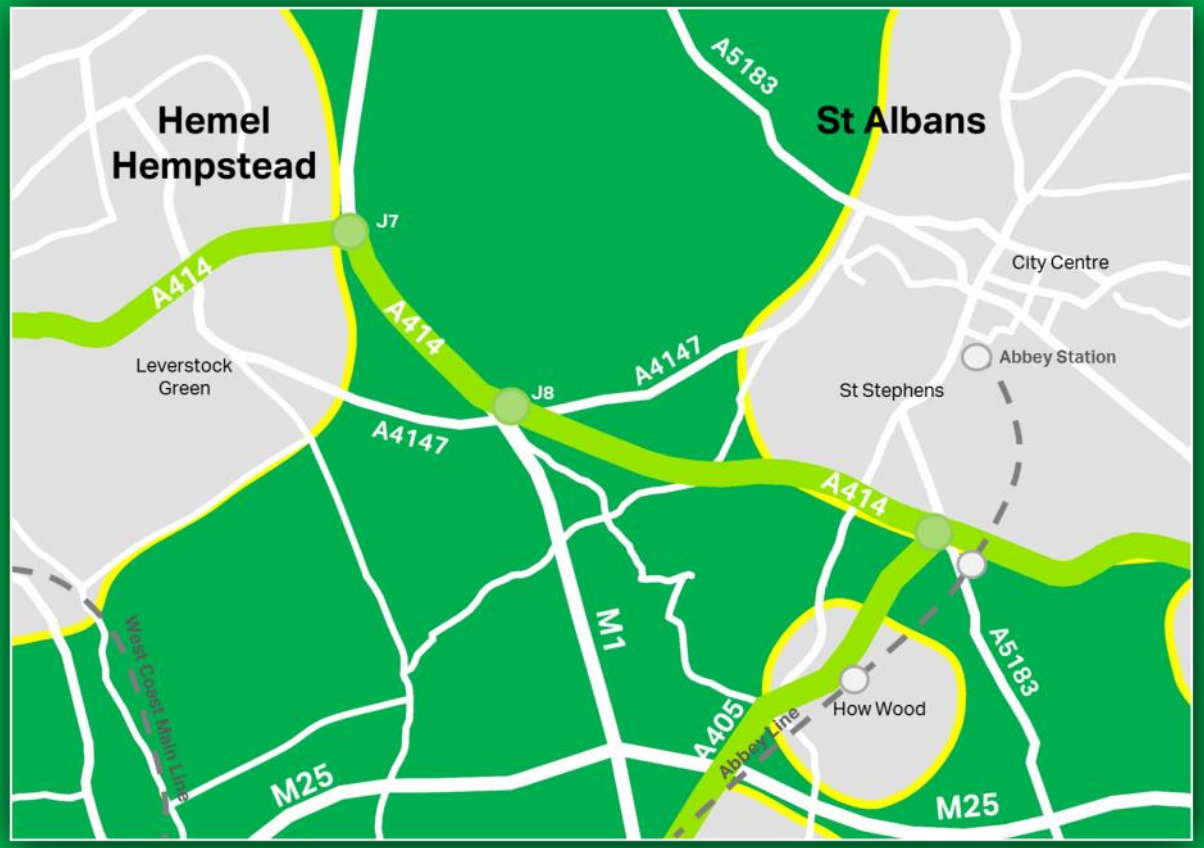
LTP4, this strategy and the South West Hertfordshire Growth and Transport Plan have identified a need for an additional junction on the M1 between Junction 8 (Hemel Hempstead) and Junction 9 (Redbourn). This additional junction could facilitate a limited number of movements so as not to impact surrounding roads by encouraging widespread traffic re-routing. Alternatively it could facilitate all movements in which case detailed consideration will need to be given to the effects this could have on surrounding local roads, local communities including Redbourn and what complementary transport measures may be necessary.

A414 Corridor Segment



2

Hemel Hempstead-St Albans-Park Street



Segment 2: Hemel Hempstead-St Albans-Park Street

Hemel Hempstead and St Albans are linked only by road. The A4147 provides a local road link connecting the A414 at Leverstock Green in the eastern part of Hemel Hempstead with the A5183 Redbourn Road/Verulam Road on the north-western side of St Albans. The A414 also links the two settlements, with a section running alongside the M1 and forming a series of on and offslips and weaving lanes between Junctions 7 and 8, and a dual carriageway section between the M1 and the A405/A5183 junction at Park Street (the former M10). The two settlements are also connected by a number of bus services which provide east-west connectivity beyond to places such as Hatfield. Like most segments of the corridor, there is no rail connection, and also notably there is no direct cycle route linking Hemel Hempstead and St Albans.

Focusing on the inter-urban section of the A414 alone, the vast majority of trips using this section are considered to be long distance. The A4147 in comparison is used by more shorter and medium distance trips. The A414 would therefore more likely be used to make a journey from Hemel Hempstead to Hatfield than to St Albans. As discussed in Segment 1, the western end of this segment is a focus for major housing and employment growth which will have implications on Segment 2. The A414 between the M1 and Park Street is typically uncongested and free-flowing however the junctions at either end do regularly experience peak period congestion, especially where the east-west A414 is interacting with the north-south M1 and other well-used interurban routes such as the A405 (linking Watford and St Albans).

Whilst at present this segment can be considered purely interurban in character, with the car being the most popular mode of travel, planned growth could potentially change the nature of this segment in the future. Opportunities to improve mode choice to help mitigate any impacts at important junctions with the M1 and A405 are also important, especially where journeys could be made by public transport or by active travel modes.

Segment 2 Summary (see Evidence Report for more			
Trip	Long (>15km) 92%	Medium (5-15km) 8%	Short (0-5km) 0%
Key Infrastructure and Services	**Highway** • A414 in this segment is dual-carriageway with a 70mph speed limit. • A4147 connects Hemel Hempstead to St Albans city centre. • A414 ties into M1 to the West and the A405 to the East.		
	Public Transport • Bus routes 300 and 301 run along A4147. • A414 not served by any bus services.		
	Walking/Cycling • The Nickey Line cycle route runs between Hemel Hempstead and Harpenden via Redbourn.		
Segment Challenges	**Highway Issues** • AQMA where A414 joins M1 . • Delays at junctions on the edge of both Hemel Hempstead and St Albans • Most trips are strategic (M1, M25 abd A1(M) traffic) • A414 acts as an alternative to M25 in times of disruption. • Several junctions are HCC defined hazardous sites.		
	Public Transport Issues • None identified - largely rural segment served by interurban buses on the A4147.		
	Walking/Cycling Issues • No direct cycle route connecting St Albans and Hemel Hempstead. • Poor cycle infrastructure between Hemel Hempstead and St Albans - only 0.7% of commuters cycle		

Segment 2: Hemel Hempstead-St Albans-Park Street

Segment 2 Priorities

An interurban corridor promoting more resilient and time efficient journeys by car, bus and bike

- Maintain the strategic function of the A414 between the M1 and A405 (continued to be managed by Highways England).
- Implement an off-road cycle track alongside the A414, connecting the Nickey Line, Maylands and existing/proposed cycle tracks along the A414 and A405.
- The A4147 corridor will be prioritised for more local trips between Hemel Hempstead and St Albans urban areas only, with improved provision for local bus services, walking and cycling.

Segment 2: Hemel Hempstead-St Albans-Park Street

Packages Overview

Package 3 - Hemel Hempstead - Park Street - St Albans Connectivity

The overarching aim of Package 3 is:

To maintain the A414 's role as an inter-urban corridor facilitating medium and longer distance trips, and providing greater mode choice across both the A4147 and A414 to help mitigate the effects of increased traffic, including that arising from planned housing and employment growth in the surrounding area.

The package consists of:

- Providing a continuous off-road cycle route between Hemel Hempstead, St Albans and Park Street.
- Improvements to the A414/A405/A5183 Park Street Roundabout to manage delays and help facilitate growth.

The table below summarises the interventions in this package.

A414 Package 3 - Hemel Hempstead - Park Street		
Name	**Short Description**	**Estimated Cost Range**
A414 Cycle track (M1 J7-8 Section of the A414)	Planned off-road cycle route alongside part of the A414 (M1 J7-8 section) and connecting to the A4147, then running off road alongside the A4147 to St Albans.	£500k - £1m
A414 Cycle track: Hemel Hempstead to Park Street, St Albans	Cycle track alongside the A414 to connect Maylands with Park Street and beyond (and A414 / A405 shared cycle tracks).	£500k - £1m
A414 Park Street Roundabout Improvements	An improvement to the existing roundabout layout with signal-control introduced to most if not all arms and some minor physical alterations to the junction's layout. Provision should be made for improved pedestrian and cyclist crossings.	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK3	TOTAL INDICATIVE COST RANGE ESTIMATE	£2m - £5m

Package 3 - summary map

Segment 2 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

For Segment 2, the function of the A414 section currently is to facilitate longer distance trips and this is not expected to change significantly in the future.

However, with planned housing and employment growth in the surrounding area, there could potentially be a greater mix of trip types within this segment, with shorter distance trips taking place to nearby settlements and employment areas including Watford, St Albans, Hatfield business park and Maylands.

At the western end, the Maylands industrial area is already a major attractor of trips from a wide area spanning not just the western part of Hertfordshire but also areas to the north and south. The Hertfordshire IQ Enterprise Zone and planned employment growth as part of the proposed Hemel Hempstead Garden Communities is likely to attract additional trips from outside the immediate urban area, and whilst existing patterns of trips may largely persist, the types of higher skilled jobs that are expected to be offered as part of the Enterprise Zone could attract more trips from central and eastern parts of Hertfordshire and this could place more emphasis on the A414 corridor.

Providing attractive and convenient alternatives to the car for a range of trip types and lengths, such as new cycle routes will give future employees far more travel choice than is currently on offer, and this will help mitigate what might otherwise occur which is a substantial increase in traffic congestion especially at key junctions such as the A414/A405/A5183 Park Street Roundabout.

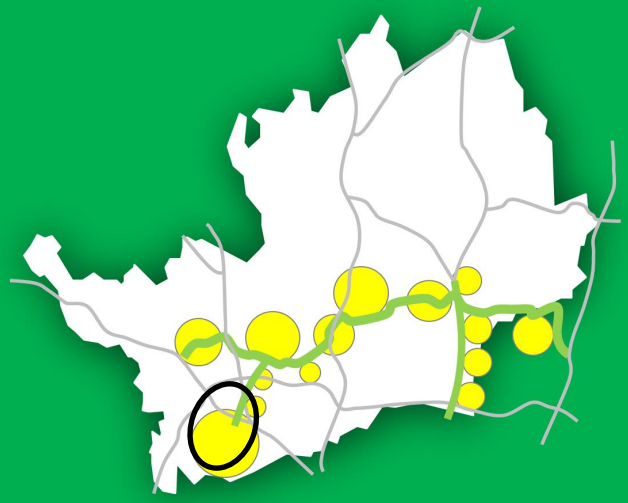
Towards the eastern end of this segment, there is the potential for additional housing development around Park Street as part of a Garden Village development. This will certainly generate new trips, and so the opportunity exists to ensure as many of these new trips can take place by public transport, on foot and by bike, otherwise additional car trips will only add pressure to already congested junctions in this segment.

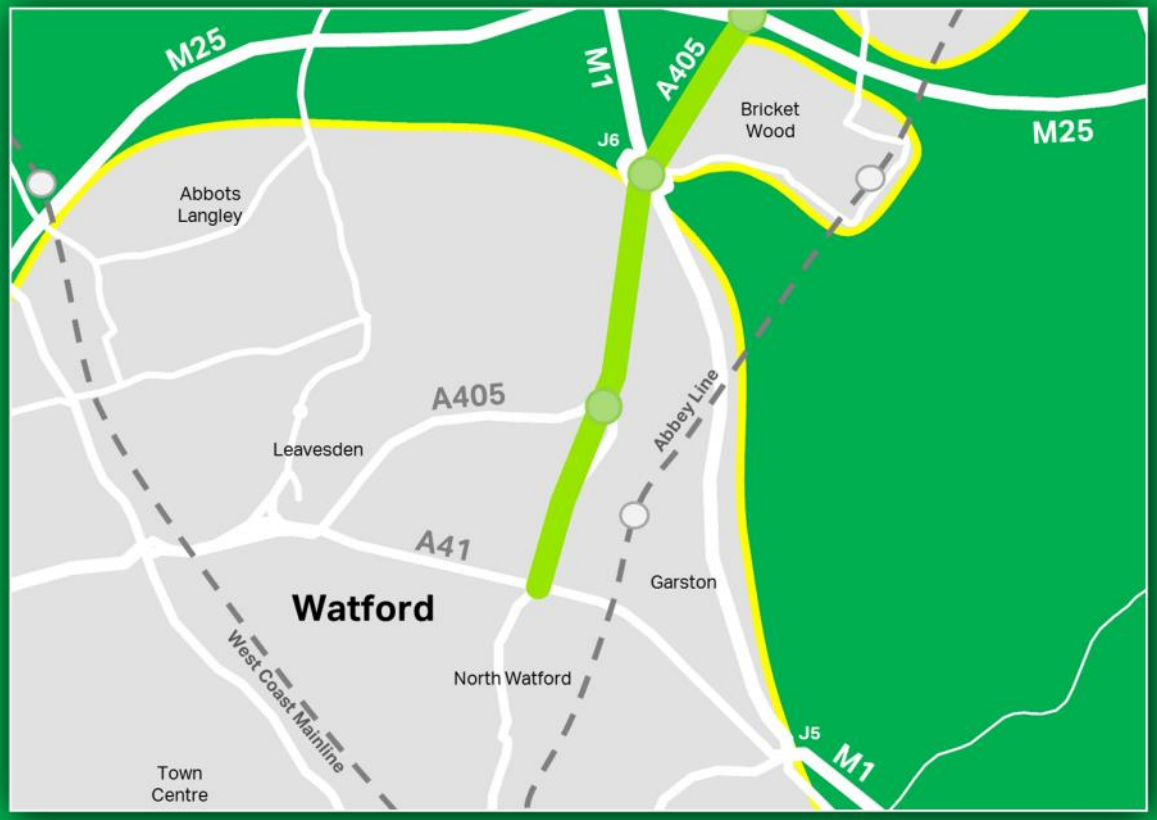
The Abbey Line will continue to play an important role in linking St Albans with Watford via Park Street, and a Mass Rapid Transit will facilitate better north-south and east-west connectivity, with MRT services linking to St Albans, Hemel Hempstead, Watford, Hatfield and beyond.

A414 Corridor Segment

3

Watford-Garston





Segment 3: Watford-Garston

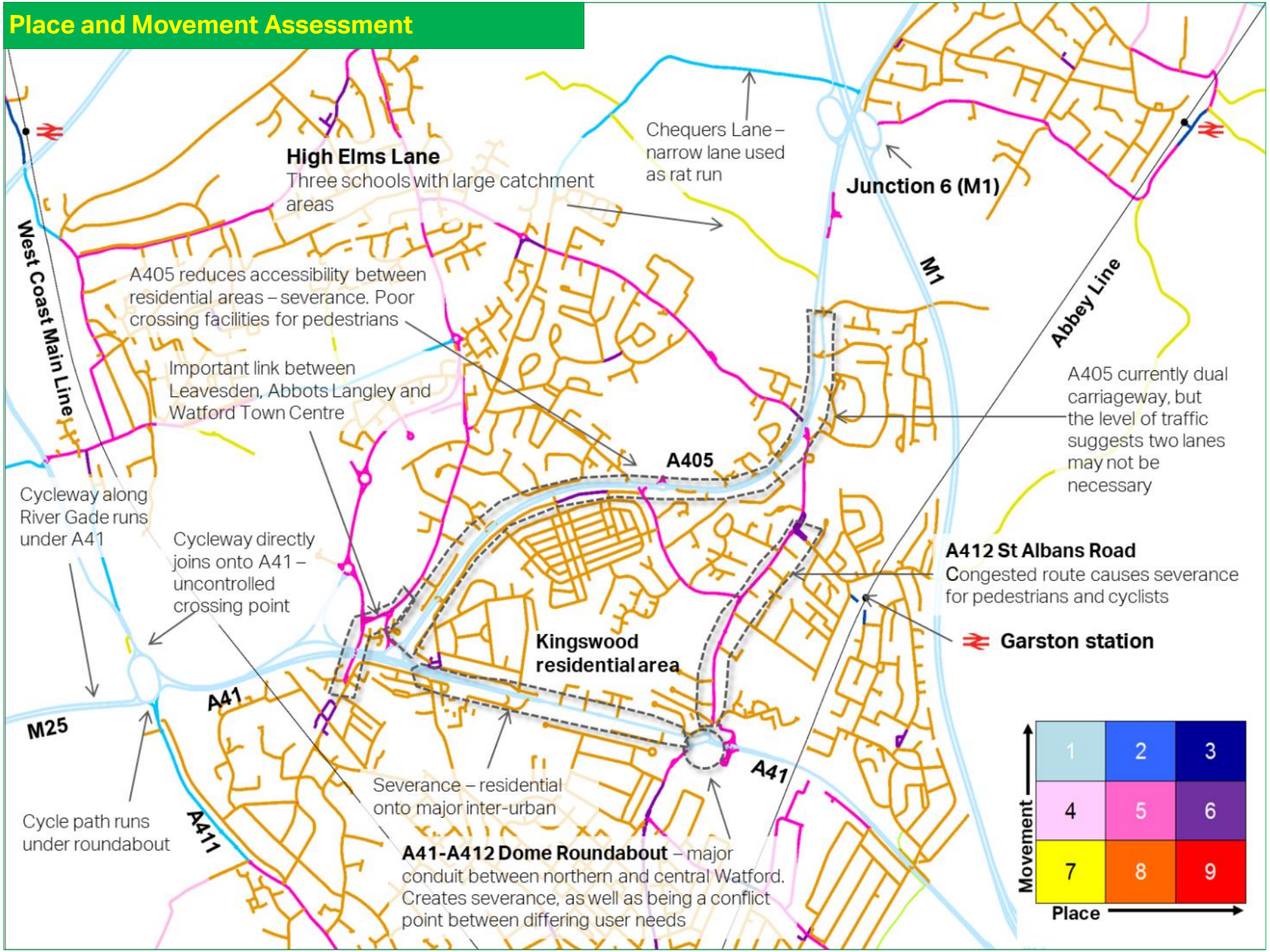
Watford is one of the largest urban settlements in Hertfordshire and is a major attractor for employment as well as for leisure and retail. Functionally, the town extends further than the administrative Watford Borough boundary, including parts of Three Rivers district (Leavesden, Abbots Langley, South Oxhey) and Hertsmere (Bushey).

Watford is well connected by a range of travel modes to surrounding urban areas. Existing travel connections include the A405 (a high speed,/high capacity A-road linking the M25 west of Watford and the A414 at Park Street), and the Abbey Line which is formed of an electrified, single track branch line connecting Watford Junction station and St Albans Abbey station, with stations at Watford North and Garston. The A412 is also an important access route into Watford town centre from the north and west, and it connects with the A405 in the Garston area of the town. A number of bus services route along the corridor, including the 321 service which links Watford, St Albans and Luton, and the 724 which links Watford with Heathrow Airport, St Albans, Hatfield, Welwyn Garden City, Hertford and Harlow.

The section of the A405 which runs through this segment is a high speed road. It used to form part of the London Northern Orbital and had an important function prior to the opening of the M25. Since the M25 was implemented, the A405's function has become more localised, albeit it is still an attractive route for some longer distance through-trips especially when incidents causing significant delays to traffic occur on the M25 between Junctions 19 and 21a. Typically the A405 through North Watford is fairly free-flowing as ample highway capacity is provided, however the road causes severance between communities on either side who rely on a series of subways to travel on foot from one side to the other. The A405 is overwhelmingly car-focused, with some regular bus services (running mostly along the A412 rather than along the A405 towards Leavesden). A summary of the segment's key characteristics and challenges is presented to the right.

Segment 3 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 58%	Medium (5-15km) 29%	Short (0-5km) 13%
Key Infrastructure and Services	**Highway** • A405 is dual-carriageway with a 50mph speed limit, running between the M1 and the A41. • A405 is used by a combination of longer and shorter trips. • A405 is highly strategic.		
	Public Transport • Garston railway station, on the Abbey Line, is located in this segment. • Bus services 321 and 724 stop in this segment and provide journeys between S Albans and Watford.		
	Walking/Cycling • The Abbey Way is a cycle route between Watford and St Albans via a mixture of on-road cycle lanes and off-road cycle tracks. • North-south cycle connectivity via the cycle path along the River Gade.		
Segment Challenges	**Highway Issues** • AQMA at the A405/Horseshoe Ln junction. • A405 generally uncongested but adjacent local roads do experience delays during peak hours. • Several junctions are HCC defined hazardous sites.		
	Public Transport Issues • PT journey times to centre of Watford are variable (25-50 mins). • Abbey Line services are infrequent—every 45 minutes.		
	Walking/Cycling Issues • Existing cycle infrastructure may not be fully utilised because of need to cross the A405/A41 to access Watford. • The off-road cycle track along the A405 ends at M1 junction 6, so connectivity towards St Albans is limited.		

Place and Movement Assessment



Segment 3: Watford-Garston

Segment 3 Priorities

An urban transport and travel network facilitating local journeys by sustainable modes between local communities with good access to Watford town centre by public transport, and a presumption against facilitating longer distance through trips between the M25 and M1 on the A405 within northern Watford

- Remove the section of the A405 between M25 J19 and the A412 from the current Primary Route Network and exclude from the proposed Major Road Network.
- The A405 will no longer be a major strategic route and instead its function as a local distributor road will be enhanced with a priority for improving local journey links between Abbots Langley, Leavesden, the Kingswood residential area and Garston.
- Reduce road space on the dualled 2-lane section of the A405 between the A41 and A412 where traffic volumes are low.
- Reduce traffic speeds and improve perception of safety.
- Improve the sense of place within the immediate road environment.
- Remove grade-separated pedestrian crossing facilities and replace with high quality at-grade crossings on the A405.
- Release surplus land after road space is reduced for a new linear park, improved footway and cycle route provision and/or new development (if locally desirable).

Segment 3: Watford - Garston

Packages Overview

Package 4 - St Albans-Watford Corridor

(broadly consistent with Package 4 in the South West Hertfordshire Growth and Transport Plan)

The overarching aim of Package 4 is:

To transform the A405 into a multi-modal road by diverting strategic traffic onto the motorway network, freeing up space for more local journeys by bus, bike or by car.

The package consists of:

- Enhanced local functions of the A405 to better cater for pedestrians, cyclists and buses and reconnect communities in Kingswood and Leavesden.
- Additional slips at M25 J21 to allow all movements between the M25 and M1, and streetscape improvements along the A405 at Bricket Wood.
- Enhanced cycling facilities along the A405 linking St Albans and Leavesden.

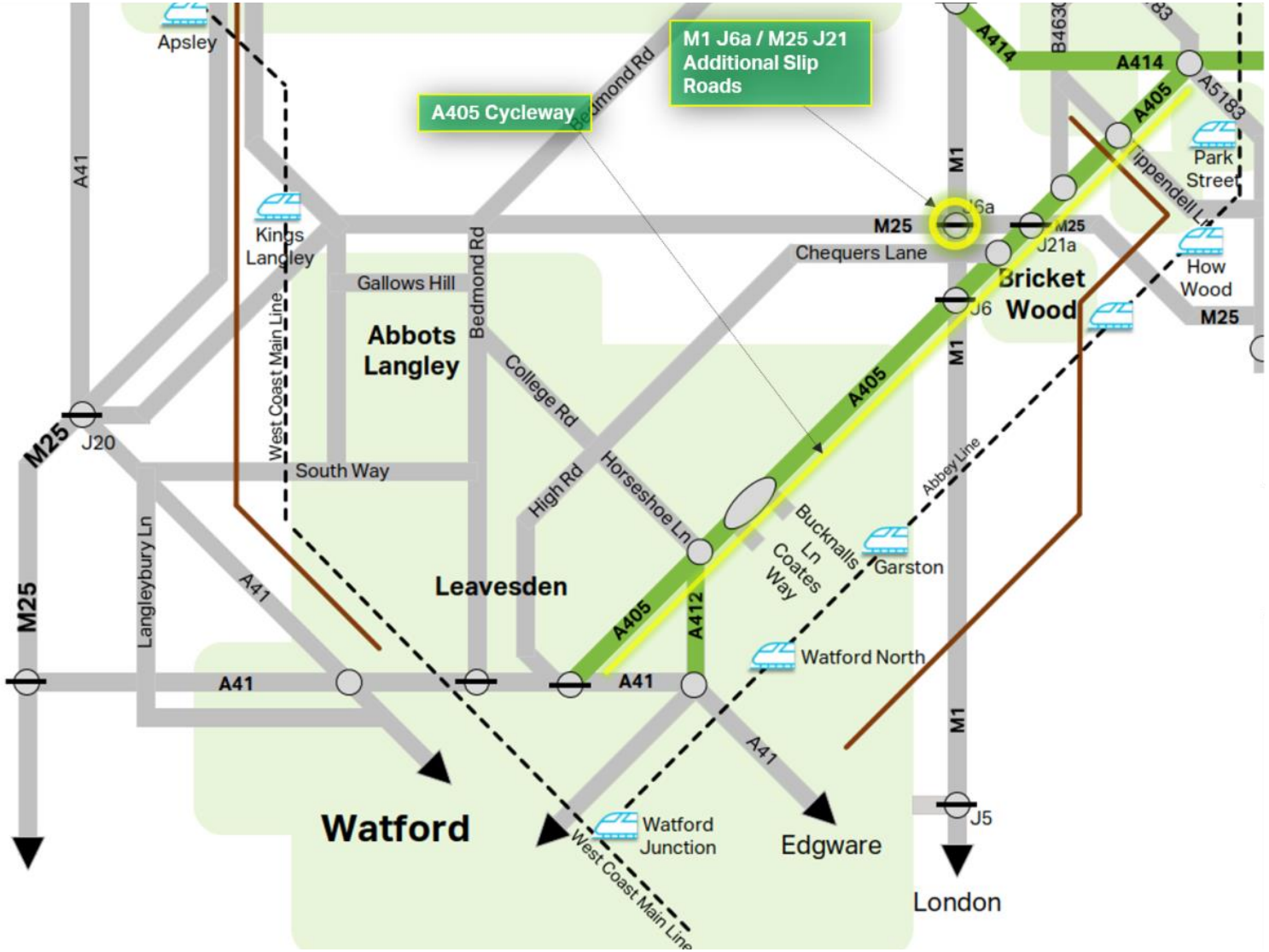
The table below/overleaf summarises the interventions in this package.

A414 Package 4 - St Albans-Watford Corridor		
Name	**Short Description**	**Estimated Cost Range**
M1 J6a/M25 J21 all movement additional slips plus options for A405 bus priority	Additional slip roads catering for all movements at M1 J6a/M25 J21a. Seek options to use freed up capacity on the A405 brought about by new junction slips in order to improve bus priority, such as with bus lanes in both directions.	£100m - £500m
A405 Cycle Route	Provision of off-road cycle route broadly alongside the A405 between Coningsby Bank (St Albans) and Bricket Wood (M1 J6). Enhancing existing cycleway continuing to Garston (including	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK4	TOTAL INDICATIVE COST RANGE ESTIMATE	£101m - £503m

Package 4 - summary map



The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

Aside from local bus services, for journeys occurring between Watford and St Albans, in particular from the outer suburbs and adjoining communities around Watford including Leavesden, there are limited viable alternatives to the car for journeys towards St Albans and other settlements in the A414 corridor.

A Mass Rapid Transit could therefore play a significant role in this segment in influencing people's travel choices. It could also help to reduce pressure on roads such as the A405.

The A412 St Albans Road in northern Watford is likely to remain an intensively used route for local residents, for access to schools and businesses, and access to central Watford. It is an urban road with residential and commercial land uses on either side and generating travel movements along the route. The A412 is used for trips destined for Watford town centre but also the hospital, the Western Gateway and Croxley business parks and as a feeder route to the A41 which provides onward linkage into northern London. Given the built-up surroundings, opportunities to make significant major changes to the A412 are more limited, and therefore the focus will continue to be on making small enhancements where necessary and feasible to improve the environment for pedestrians, cyclists, and make travelling by local bus more convenient. Again, a Mass Rapid Transit if linked to Watford Town Centre and beyond the hospital (including the Riverwell development area) and the large business parks, could help to reduce traffic pressure on the A412 in the long term.

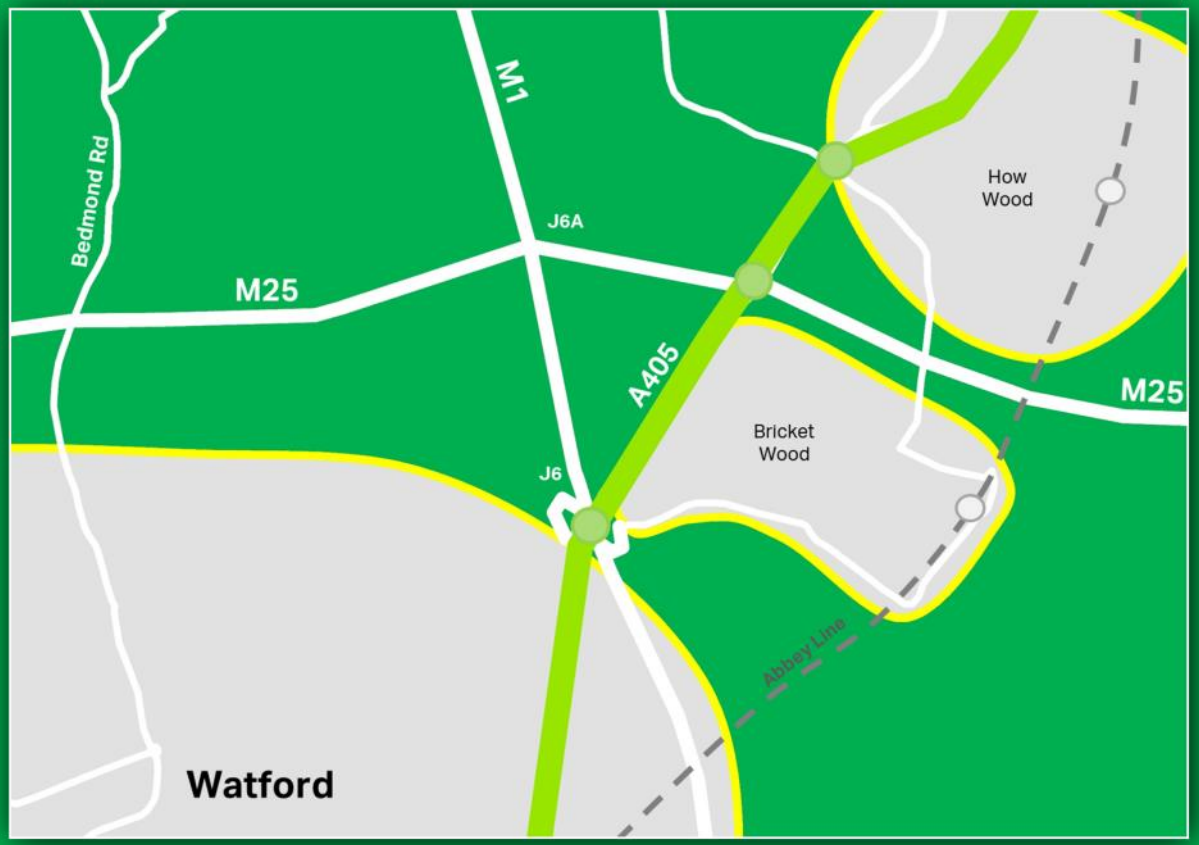
The Dome Roundabout lies at the intersection between the A41 and A412 in the northern part of Watford. As outlined in the South West Growth and Transport Plan, the focus is on interventions which would indirectly reduce traffic congestion at the Dome roundabout by encouraging non-car modes and promoting the M25 and M1 as strategic bypasses to Watford.

A Mass Rapid Transit could also aid congestion reduction at the Dome Roundabout by attracting people out of their cars who are making journeys between Watford, St Albans and beyond.

Any future land use changes surrounding the Dome Roundabout may also present an opportunity to make changes to the junction which improved walking, cycling and local bus connections.

A414 Corridor Segment

4



Bricket Wood Triangle

Segment 4: Bricket Wood Triangle

The A405, M25 and M1 join to form a large and strategically important set of junctions in south west Hertfordshire, facilitating journeys north-south along the M1, orbitally around Greater London on the M25, and also along the A405 between Watford, St Albans and other parts of Hertfordshire.

The section of the A405 between the M1 and M25 is managed and maintained by Highways England as part of the Strategic Road Network (the A405 either side is managed by Hertfordshire County Council). This is to recognise the strategic importance of this section of highway as it facilitates movement between the M1 South and the M25.

As a consequence, the section of the A405 which measures little more than a kilometre in length is intensively used by a mix of long, medium and short distance trips. Sitting alongside the A405 is the village of Bricket Wood which has access to the A405 and M1 adjacent to M1 Junction 6, and also to more local routes including Park Street Lane which connects to How Wood and Park Street to the north.

Bricket Wood also has a railway station on the Abbey Line which is slightly remote from the village with walking times of around 20 minutes.

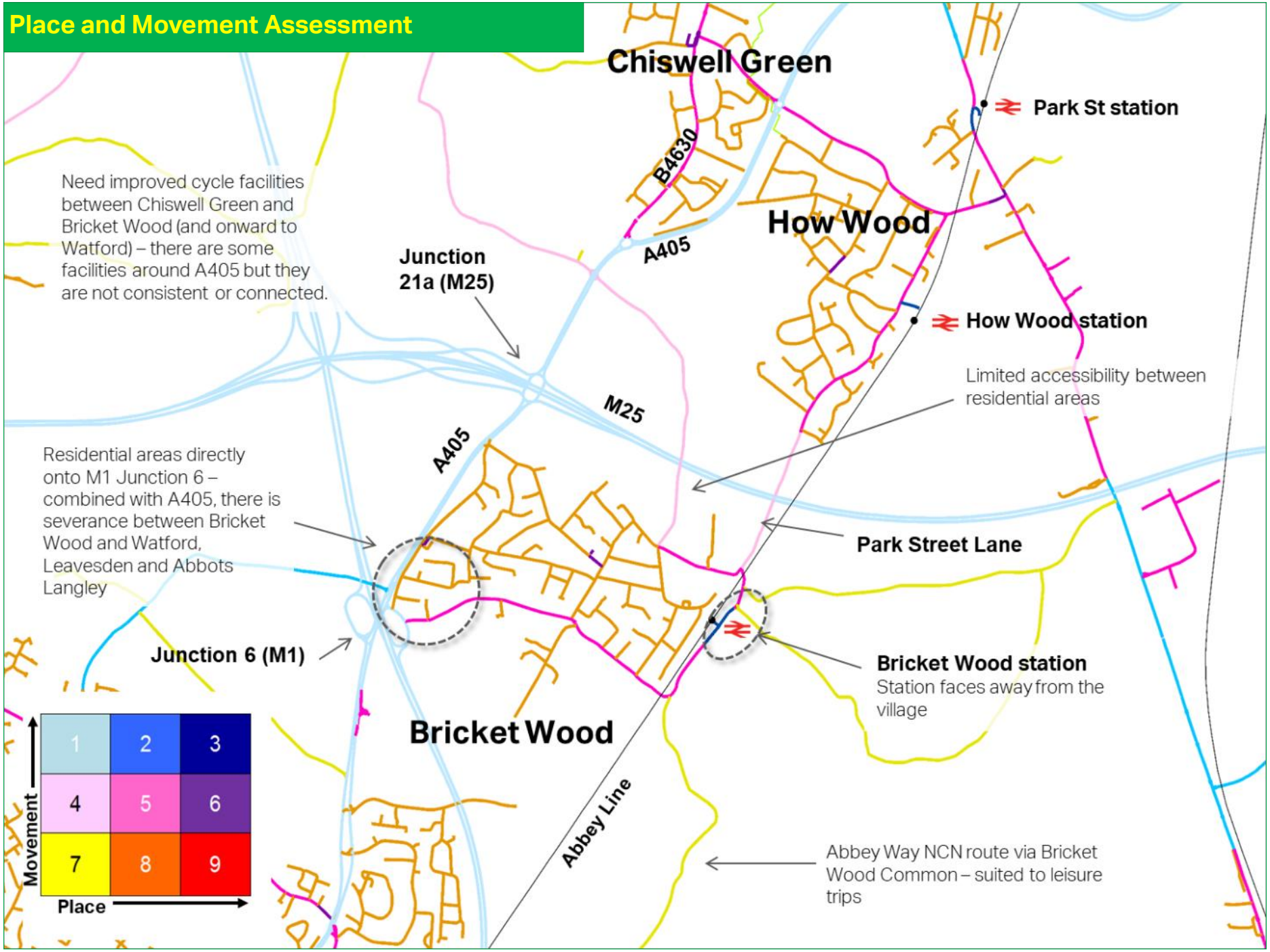
The A405 can experience severe congestion especially during peak periods around M25 Junction 21a and M1 Junction 6. This can also create delays for bus services such as the 321 service linking Watford and St Albans.

It will be important to recognise and help preserve the strategic function of this segment, but ensure this is not at the expense of local trips which could be made by cycling, bus or train.

The key characteristics and challenges for this segment are presented in the table to the right.

Segment 4 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 77%	Medium (5-15km) 21%	Short (0-5km) 2%
Key Infrastructure and Services	**Highway** • A405 is dual-carriageway with a 50mph speed limit, running between the M1 (J6) and M25 (J21a). • A405 is used by motorway traffic interchanging between the M1 and M25.		
	Public Transport • Bricket Wood railway station, on the Abbey Line, is located at the eastern edge of this segment. • Bus services 321 and 724 stop in this segment and provide journeys between S Albans and Watford.		
	Walking/Cycling • North to south cycle route is mostly on-road via the Abbey Way (part of the National Cycle Network) and is the only cycle infrastructure. The route is geared more towards leisure trips.		
Segment Challenges	**Highway Issues** • A405 very congested during peak hours with queues typically extending from M25 J21a to M1 J6. Most trips are strategic. • Several HCC defined hazardous sites.		
	Public Transport Issues • PT services within the town are infrequent. • The more frequent services run on the A405 rather than through town which may discourage users. • Train journeys to St Albans Abbey and Watford junction station are relatively long.		
	Walking/Cycling Issues • North-south cycling connectivity relies on on-road routes. • The section of the Abbey Way is on-road, and follows the narrow and rural School Lane.		

Place and Movement Assessment



Segment 4: Bricket Wood Triangle

Segment Priorities

A triangle of junctions which maintain separation between shorter and longer distance trips, with enhanced links for buses and cyclists

- Provision of additional slip roads at Junction 21 of the M25 therefore enabling all traffic movements between the M1 and M25, as well as a downgrade of A405 between M25 J21a and M1 J6.
- A405 would as a result take on a more local function enabling interurban journeys between Watford and St Albans as well as encouraging uptake of walking , cycling and public transport use.
- Encourage walking and cycling throughout Bricket Wood, including new and improved facilities for cyclists, to promote the use of the train station for travel to St Albans, Watford and beyond to London.

Segment 4: Bricket Wood Triangle

Packages Overview

Package 4, first discussed in Segment 3, is also relevant to Segment 4 and is therefore repeated below for completeness.

Package 4 - St Albans-Watford Corridor

(broadly consistent with Package 4 in the South West Hertfordshire Growth and Transport Plan)

The overarching aim of Package 4 is:

To transform the A405 into a multi-modal road by diverting strategic traffic onto the motorway network, freeing up space for more local journeys by bus, bike or by car.

The package consists of:

- Enhanced local functions of the A405 to better cater for pedestrians, cyclists and buses and reconnect communities in Kingswood and Leavesden.
- Additional slips at M25 J21 to allow all movements between the M25 and M1, and streetscape improvements along the A405 at Bricket Wood.
- Enhanced cycling facilities along the A405 linking St Albans and Leavesden.

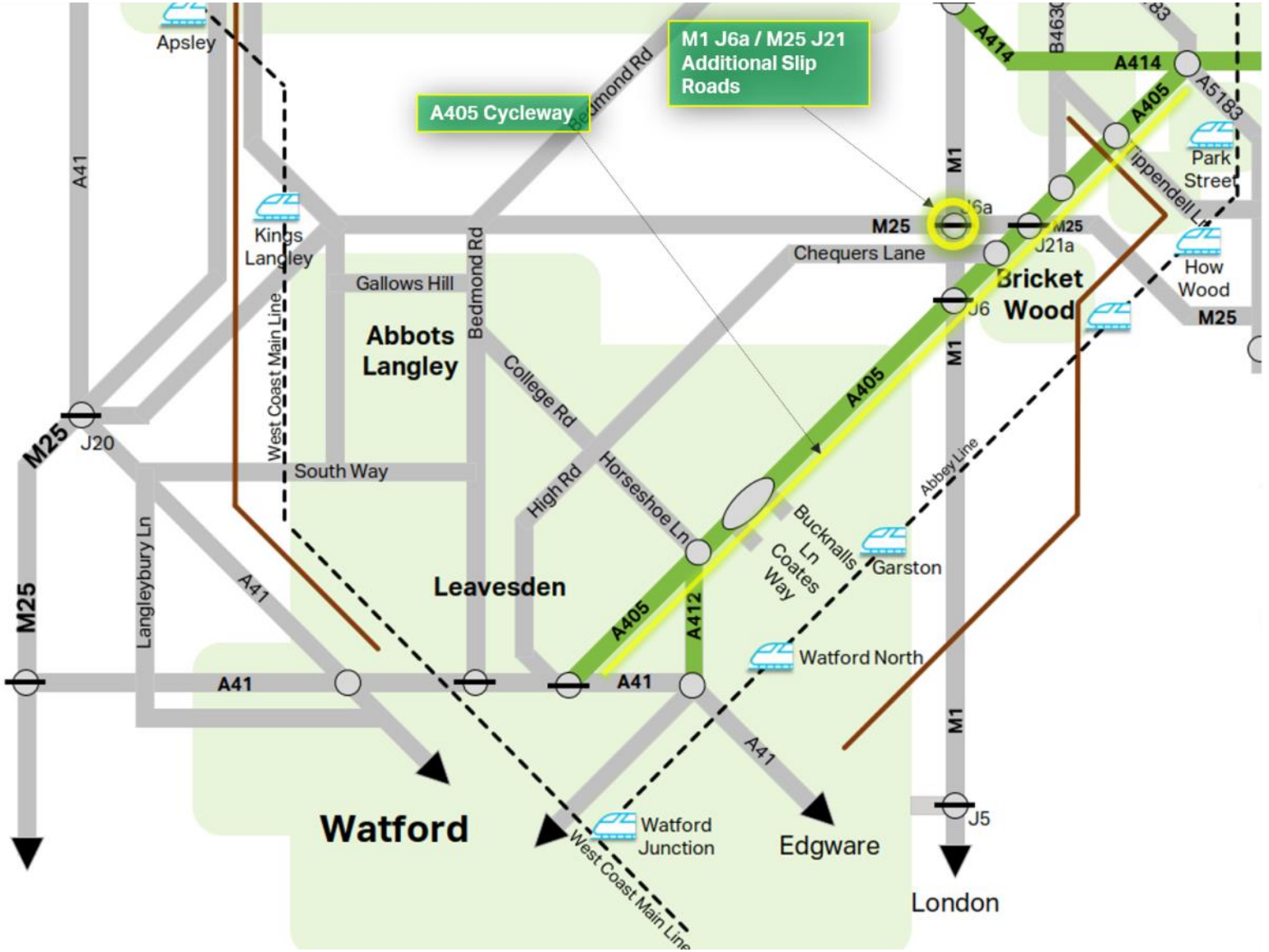
The table below summarises the interventions in this package.

A414 Package 4 - St Albans-Watford Corridor		
Name	**Short Description**	**Estimated Cost Range**
M1 J6a/M25 J21 all movement additional slips plus options for A405 bus priority	Additional slip roads catering for all movements at M1 J6a/M25 J21a. Seek options to use freed up capacity on the A405 brought about by new junction slips in order to improve bus priority, such as with bus lanes in both directions.	£100m - £500m
A405 Cycle Route	Provision of off-road cycle route broadly alongside the A405 between Coningsby Bank (St Albans) and Bricket Wood (M1 J6). Enhancing existing cycle route continuing to Garston (including the Leisure park) and Leavesden (including the business park).	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK4	TOTAL INDICATIVE COST RANGE ESTIMATE	£101m - £503m

Package 4 - summary map



Segment 4 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

The A405 will continue to form an important inter-urban route within the corridor facilitating a range of shorter and longer distance trips. The route is however predominantly car focused, and traffic congestion and delays is a common occurrence. The interventions put forward in this segment, alongside a Mass Rapid Transit, aim to help to increase opportunities for trips to be made by bus, on foot and by bike.

A downgraded A405 which could comprise replacing the existing dual carriageway road with a single carriageway road alongside enhanced facilities for pedestrians and cyclists and better connected local communities could unlock some land for redevelopment if this is deemed appropriate in policy terms, feasible in engineering terms and also acceptable to local people. This would not necessarily be land for housing - it could be instead be transformed into a linear park.

The M25 orbital route will continue to be one of the most important highway links in the country. The resilience of the M25 in the face of traffic incidents which lead to delays and prolonged closures will continue to have local implications especially where motorists choose to avoid these delays and utilise alternative routes such as the A405. Any downgrade of the A405 will need to be considered carefully in this context however this should not be seen as an obstacle to achieving what are important local priorities in the Leavesden and Kingswood areas, e.g. access to schools, shops and key services, and having real choice in terms of how to travel.

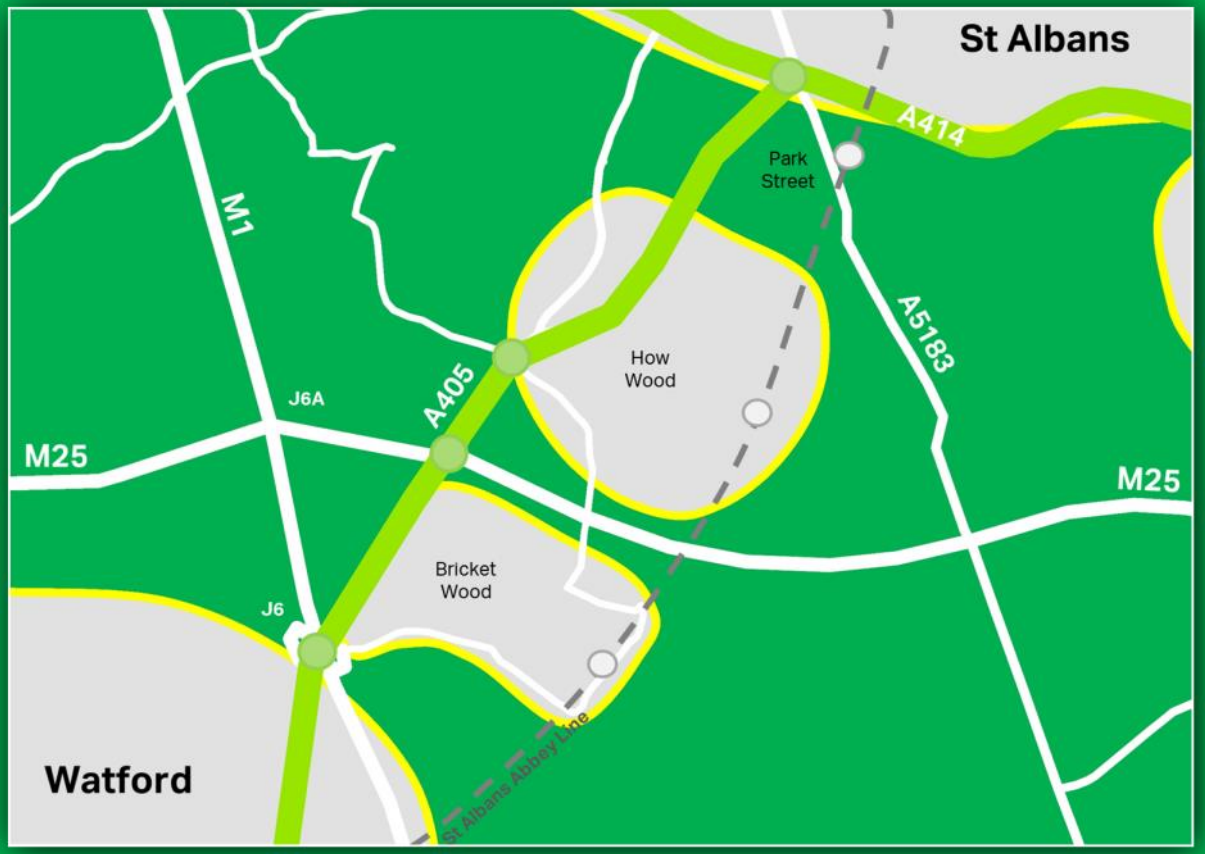
If through more detailed investigations and discussions with Highways England and other stakeholders it is determined that a major re-design of M25 J21 is not feasible or indeed desirable in a national context, this should not preclude efforts to encourage modal shift and discourage the use of the A405 as a rat-run especially if this is to the detriment to local communities.

The form and alignment of a Mass Rapid Transit could also prove crucial for this segment. In the longer term, connectivity into Watford and St Albans could benefit all communities along the route including Bricket Wood. Providing local connections to MRT interchanges through villages such as Bricket Wood will therefore be required to help make the new transit corridor a success.

A414 Corridor Segment

5

Park Street-How Wood-Chiswell Green



Segment 5: Park Street-How Wood-Chiswell Green

The villages and suburban communities of Park Street, How Wood and Chiswell Green lie to the south west of St Albans. Park Street and How Wood are each served by railway stations on the Abbey Line and are located on the eastern side of the A405 and south of the A414 dual carriageways. Access by road to St Albans, the largest urban settlement in the local vicinity requires use of either the A405 or A414 from these villages. The villages are also well served by local buses, including the 635 service linking Watford, Hatfield and Stevenage.

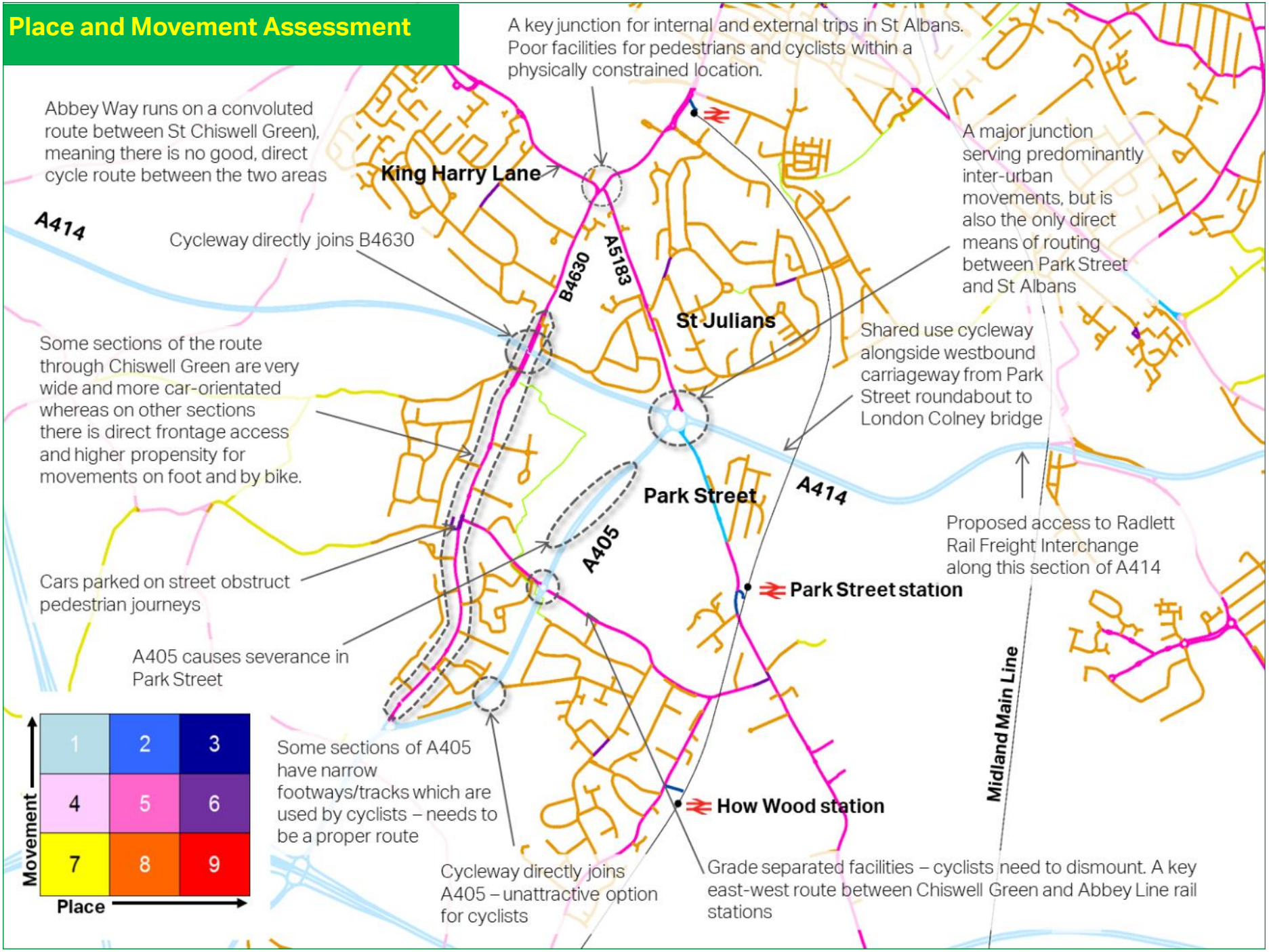
Chiswell Green lies on the western side of the A405 and south of the A414 dual carriageways. It is connected to St Albans via the B4630 Watford Road. This is one of the busiest B-roads in Hertfordshire. The B6430 passes over the A414. Chiswell Green is served by the inter-urban 321 bus service which links Watford, St Albans and Luton.

The A405 and A414 in this segment are used predominantly for longer distance trips. Some of these trips will start or end in the local area (e.g. people travelling between home and work) whereas some will be through-trips which are neither beginning or ending in the local area.

As with other segments in the corridor, the challenge for Segment 5 will be to preserve the strategic functions of the A405 and A414 whilst not hindering opportunities to facilitate journeys by more sustainable modes, especially where these journeys are to within the segment itself, to St Albans, Watford or to other towns within the corridor.

Segment 5 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 88%	Medium (5-15km) 11%	Short (0-5km) 1%
Key Infrastructure and Services	**Highway** • A405 is dual-carriageway with a 70mph speed limit. • Parallel routes to the A405 include Watling Street and Watford Road • A405 is highly strategic.		
	Public Transport • Park Street railway station and How Wood railway station are connected to St Albans and Watford via the Abbey Line. • Bus services 321, 724 and 601 stop in this segment and provide journeys between S Albans, Watford and Borehamwood.		
	Walking/Cycling • The Abbey Way passes through this segment and is primarily on-road through How Wood and Chiswell Green, with a short off -road section towards the A414.		
Segment Challenges	**Highway Issues** • AQMA near Colney Street. • Typically congestion on the approaches to Park St roundabout and M25 J21a. • A405 used heavily by traffic moving between the A1(M) and M25 - this route is shorter than using M25 J23.		
	Public Transport Issues • Train journeys to St Albans Abbey and Watford junction station are relatively long.		
	Walking/Cycling Issues • Off-road infrastructure is limited and does not provide off-road access into town centres.		

Place and Movement Assessment



Segment 5: Park Street-How Wood-Chiswell Green

Segment 5 Priorities

An interurban corridor promoting more resilient and time efficient journeys by car, bus, bike and rail

- The A414 continues to function as a more strategic link for both inter-urban and longer distance through traffic.
- Upgrade of the A414/A405 Park Street Roundabout to ease congestion and aid the A414 as a strategic route.
- Improvements to walking and cycling facilities on the B6430 Watford Road through Chiswell Green with the aim of encouraging a shift of through trips (neither beginning nor ending in Chiswell Green) to the A405.
- Focus on improving train station access (either Park Street or How Wood) for residents of Chiswell Green through better walking and cycling links along Tippendell Lane.
- Provision of more cycling infrastructure in the segment including an off-road cycle track alongside the A405, to enable inter-urban journeys by bike.

Segment 5: Park Street-How Wood-Chiswell Green

Packages Overview

Package 5 - Chiswell Green Corridor Active Travel Improvements

The overarching aim of Package 5 is:

To improve connectivity between Chiswell Green, Park Street and St Albans, and reduce through traffic on the B4630 corridor.

The Package consists of:

- Improvements to the B4630/Watford Road through Chiswell Green to encourage walking and cycling, making the road less attractive for through trips.
- Improvements along the A405, including roundabout upgrades at B4630/Watford Road and the A414.

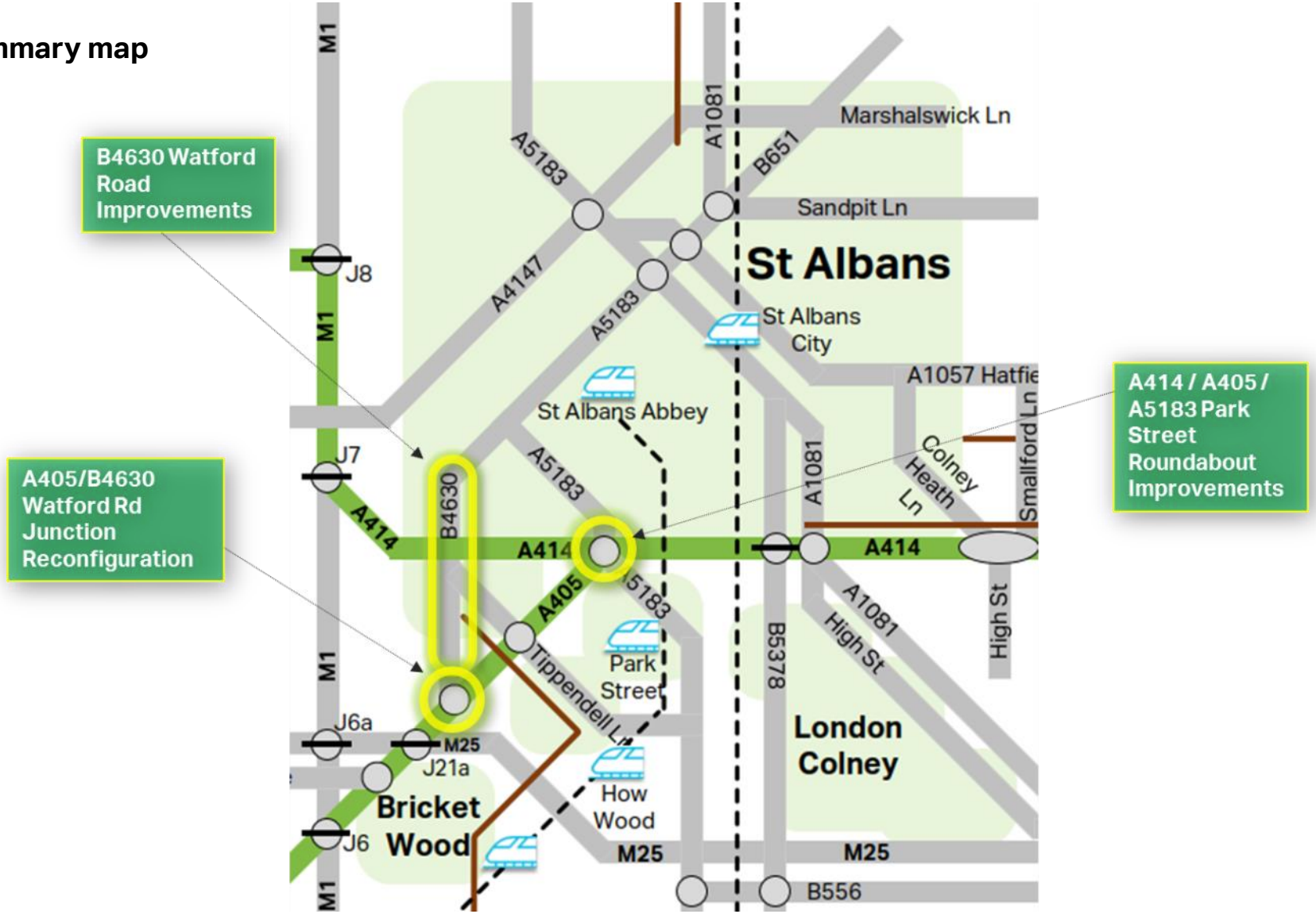
The table below summarises the interventions in this package.

A414 Package 5– Chiswell Green Corridor Active Travel Improvements		
Name	**Short Description**	**Estimated Cost Range**
A414 Park Street Roundabout Improvements	An improvement to the existing roundabout layout with signal-control introduced to most if not all arms and some minor physical alterations to the junction's layout. Improvement could potentially incorporate bus priority for bus services routing between Park Street and St Albans. Provision should be made for improved pedestrian and cyclist crossings.	£1m - £2.5m
B4630 Watford Road Improvements	Interventions to reduce through traffic. It is currently the B road with highest flows in Hertfordshire. On-road cycle lane in each direction (removing central hatched areas) and physical narrowing of the road where feasible could be introduced.	£2.5m - £5m
A405/B4630 Watford Road junction reconfiguration	Conversion of the existing roundabout to a signal-controlled crossroads with more priority given to the A405 arms. Improvements would need to ensure signal priority is given to bus services (e.g. 321).	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK5	TOTAL INDICATIVE COST RANGE ESTIMATE	£5m - £10m

Package 5 - summary map



Segment 5 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

Any improvements to the Park Street Roundabout will need to incorporate suitable and attractive crossing facilities for pedestrians and cyclists. Improvements to Park Street will also need to consider future development in the area.

Currently the only grade separated crossing facility is beneath the A414 eastern arm of the junction enabling people to travel from one side to the other without interacting with traffic. There are at-grade crossings on the A5183 Watling Street arm (Park Street) however pedestrians and cyclists would be required to cross against traffic.

A new transport interchange associated located adjacent to the A414 and Abbey Line, needs to be well connected with its surroundings. Access will need to be gained by road via the A414, and hence a new junction on the A414 will be required. The layout and form of operation of this access junction (traffic signal-controlled, priority controlled) will need to be carefully considered especially in relation to the operation of the nearby Park Street roundabout and planned improvements here.

The interchange will also need to be reached on foot and by bike. This would point to the potential need for much enhanced crossing facilities at the nearby Park Street Roundabout, especially where new off-road cycle routes could be feeding in from the A405 (Bricket Wood, Watford) and the A414 (Hemel Hempstead).

In relation to the surrounding area, there is the prospect of additional housing growth around Park Street in terms of a potential new Garden Village. The planned Radlett Strategic Rail Freight Interchange also remains a future prospect.

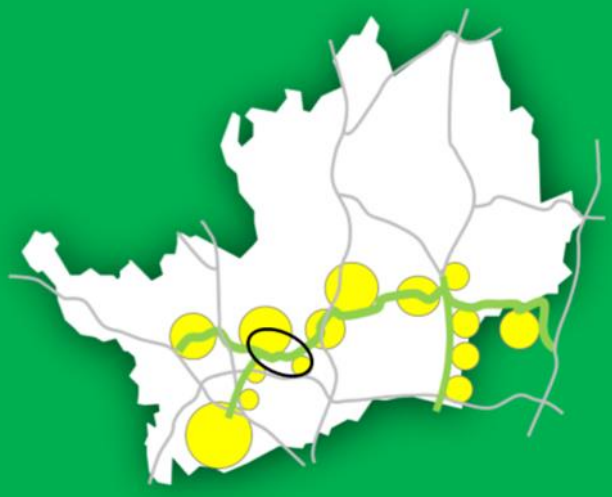
New developments will generate new travel demands on the surrounding transport network. The ambition would be for as many of the trips by future residents and employees to be undertaken by more sustainable modes, otherwise surrounding roads such as the A405 and A414 could become more overloaded.

A Mass Rapid Transit which could route via an interchange north of Park Street, with high quality links on foot and by bike, could be key to enabling future residents to make journeys by more sustainable modes.

A414 Corridor Segment

6

Park Street-St Albans–London Colney



Segment 6: Park Street-St Albans-London Colney

The village of Park Street and the small town of London Colney are located on the southern side of the A414, to the south of St Albans. Park Street is located on the Abbey Line and has a railway station. The larger London Colney is not connected by rail, although the Midland Main Line runs to west of the town. Both settlements are characterised by having access to the A414 via heavily trafficked junctions which experience congestion and delays especially during peak periods - the A414/A405/A5183 Park Street Roundabout and the A414/A0181/High Street London Colney Roundabout.

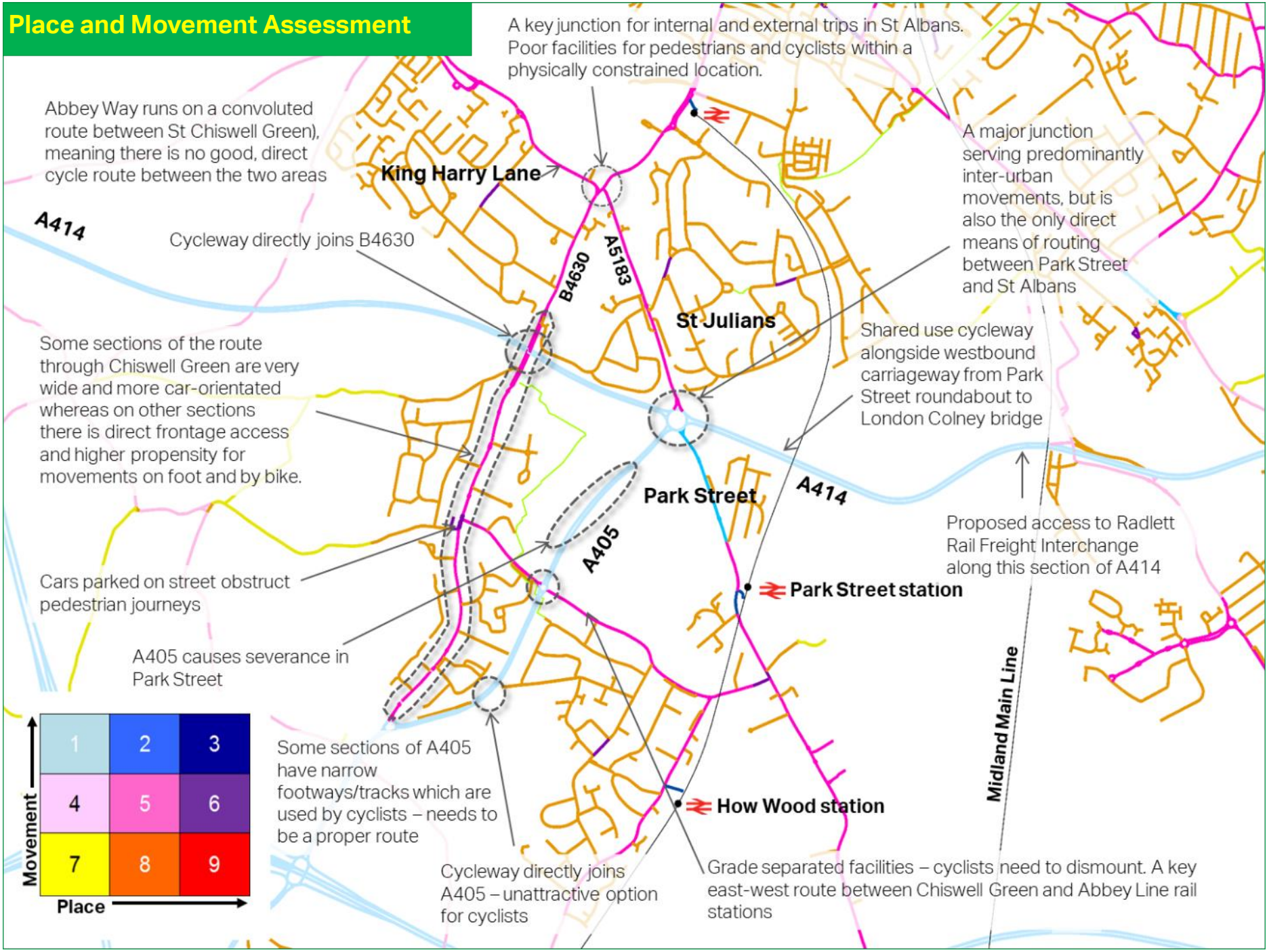
People seeking to leave London Colney or Park Street are particularly affected as the junction designs prioritise movement along the A414. The predominant traffic movements are those along the A414, A405, and to a slightly lesser extent the A1081.

There is the prospect of additional housing as part of a Garden Village development around Park Street. London Colney will also be a focus for major housing growth, and there is also the prospect of further housing growth to the south-east of London Colney within Hertsmere which could generate additional trips along the A1081and onto the A414.

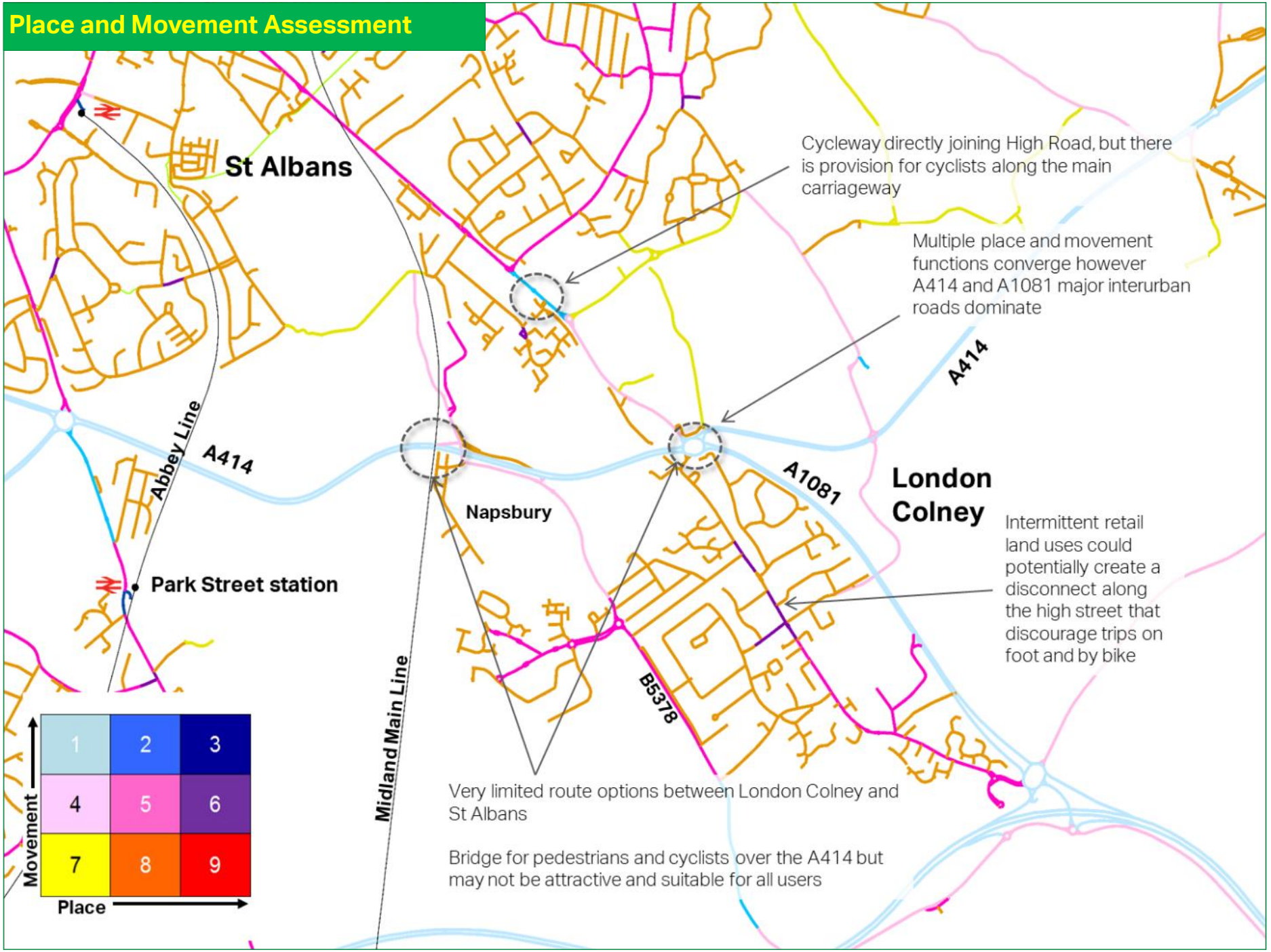
The challenge is maintaining the strategic function of the A414 along this segment (a very large proportion of trips are classed as long distance) whilst enabling shorter distance trips to safely access and cross the A414 from communities in Park Street and London Colney. Both settlements for example rely on St Albans for key services and employment. Hatfield will also be a major attractor for employment and University of Hertfordshire related trips along this segment. Opportunities to encourage a greater proportion of trips by more sustainable modes needs to be explored, alongside shorter term improvements at key junctions to help manage existing and predicted traffic congested issues.

Segment 6 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 91%	Medium (5-15km) 8%	Short (0-5km) 1%
Key Infrastructure and Services	**Highway** • A414 is dual-carriageway with a 70mph speed limit. • A414 is used by a large proportion (91%) of strategic traffic (>15km), most of which is between the M25, M1 and A1(M).		
	Public Transport • This segment is served by bus 635 (Hatfield - Watford) and is crossed by routes 601, 84, 602 and 357.		
	Walking/Cycling • An off-road pedestrian/cycle route adjacent to the A414 extends along the length of this section. • The A414 is crossed by several advisory routes including subways (Park Street) and footbridges (London Colney).		
Segment Challenges	**Highway Issues** • AQMA at the Peahen Junction in St Albans. • Significant delays at Park Street and London Colney Roundabouts with high levels of conflicting north/south and east/west turning movements. Both are HCC defined hazardous sites. • Trips are strategic in nature, between the M1, M25 and A1(M). • A414 acts as an alternative to M25 in times of disruption.		
	Public Transport Issues • Largely rural settlement served only by the infrequent 635 bus.		
	Walking/Cycling Issues • Cycle track running adjacent to the A414 is considered unsafe/ unattractive due to its proximity to the A414.		

Place and Movement Assessment



Place and Movement Assessment



Segment 6: Park Street-St Albans-London Colney

Segment 6 Priorities

An interurban corridor promoting more resilient and time efficient journeys by car, bus and bike

- Preserve the function of the A414 within this segment for more strategic traffic movements.
- Maintain dual 2-lane carriageway standard on existing dualled sections but do not seek an increase in highway link capacity.
- Improve key junctions with the aim of facilitating more efficient and safe vehicle-based journeys and improved reliability.
- Address severance for pedestrians and cyclists between London Colney and St Albans with an improved, grade-separated link to promote more sustainable travel between these two urban areas.
- Make improved provision for inter-urban cycling alongside the A414
- Improved access by sustainable modes to St Albans City Station

Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 6 - South of St Albans and London Colney Cycle Improvements

The overarching aim of Package 6 is:

> **To provide enhanced east-west connectivity to the south of St Albans through active travel connections via London Colney.**

The Package consists of:

- Enhanced off-road cycle infrastructure to facilitate inter-urban journeys by bike

The table below/overleaf summarises the interventions in this package.

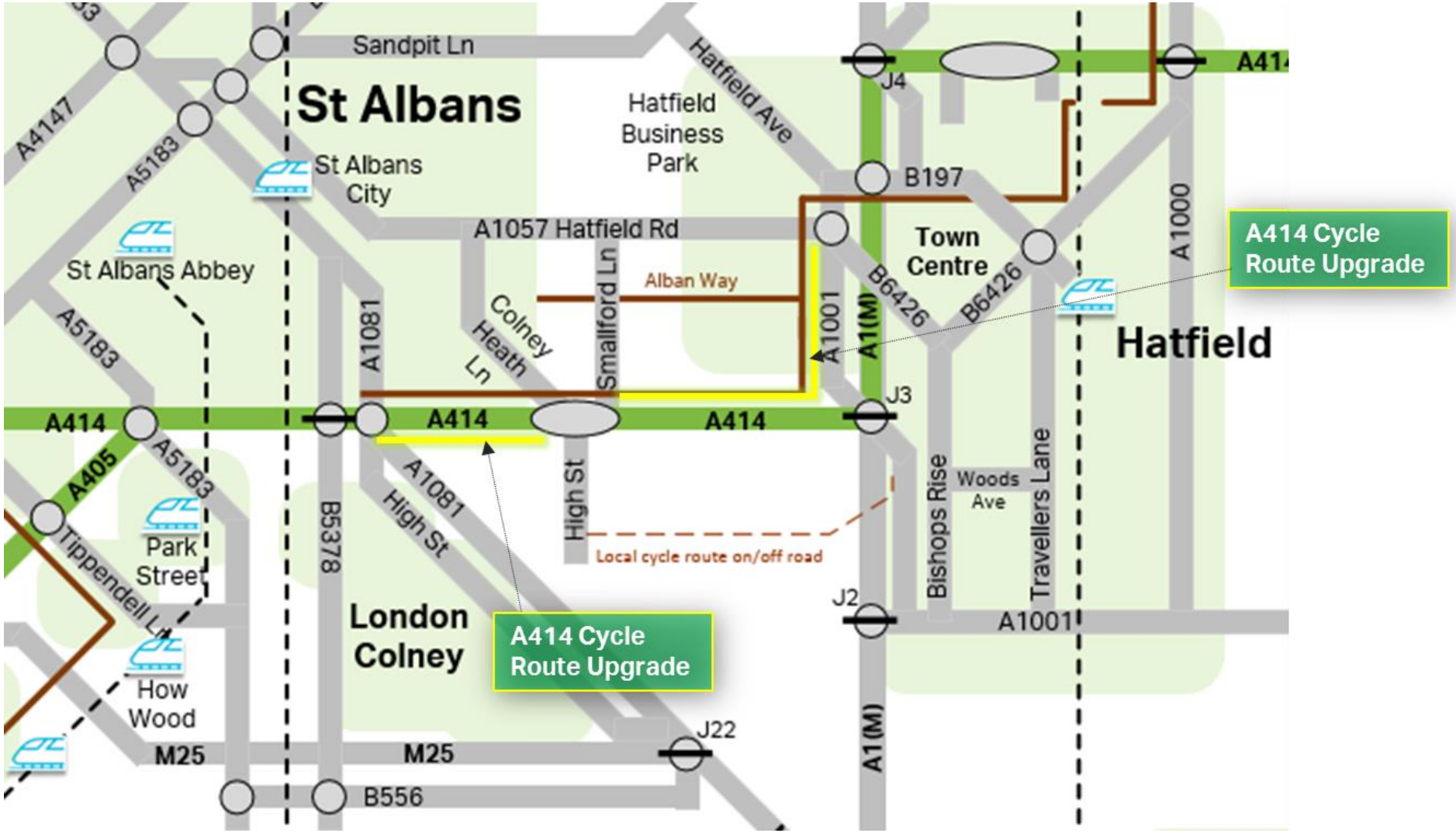
A414 Package 6 - South of St Albans and London Colney		
Name	**Short Description**	**Estimated Cost Range**
A414 Cycle Route upgrade London Colney-Hatfield	Improve the existing footway alongside the A414 to accommodate pedestrians and cyclists between the London Colney Roundabout and Comet Way (Hatfield). Consideration will also need to be given to a grade-separated link over the A1081 north of the A414 junction (potentially to be linked with the existing or improved bridge over the A414).	£500k - £1m
A414 Cycle Route upgrade Park Street-London Colney	Improve the cycle track alongside the A414 between the Park Street and London Colney Roundabouts.	£500k - £1m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK6	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£1m - £2m**

Segment 6: Park Street-St Albans-London Colney

Package 6 - summary map



Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 7 – St Albans-Hatfield Alban Way Enhancements

The overarching aim of Package 7 is:

To enhance the Alban Way and promote it as a safe, convenient and attractive option for trips between St Albans and Hatfield.

The Package consists of:

- Implementation of physical improvements to the Alban Way, including wayfinding and signage, lighting, crossings and maintenance.
- Marketing and promotion of the Alban Way as an attractive transport corridor.

The table below/overleaf summarises the interventions in this package.

A414 Package 7 - St Albans-Hatfield Alban Way Enhancements		
Name	**Short Description**	**Estimated Cost Range**
Alban Way Cycle Signage	Provide additional cycle signage along the Alban Way route including signs which provide information regarding the surrounding area	£50k - £500k
Abbey Line Ped/Cycle bridge	Investigate a new high quality bridge over the Abbey Line for pedestrians and cyclists broadly in the vicinity of the existing level crossing.	£5m - £10m
Alban Way Lighting	Consider implementation of lighting along Alban Way, either 'always on' or sensor activated, in particular within the St Albans urban area	£1m - £2.5m
Alban Way Wayfinding	Introduce new wayfinding to the Alban Way within St Albans And Hatfield. Extend Alban Way branding/signage/wayfinding beyond the extents of the actual cycle route to provide easier wayfinding to it	£50k - £500k

continued overleaf

Segment 6: Park Street-St Albans-London Colney

A414 Package 7 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Alban Way Physical Improvements	Physical improvements including surface, crossings, general maintenance, etc. Maintain a crossing over the Abbey Line as a priority, and incorporate it into any improvement scheme. Manage vegetation along the route, and clear leaf mould regularly from the relatively new surface to avoid mud building up. Investigate widening the path as it passes through Hatfield, especially to the east of the Galleria, or consider alternative busier routes as part of the Hatfield regeneration plans.	£500k - £1m
Alban Way Marketing and Promotion	Marketing and promotion of Alban Way as an attractive sustainable transport connection alongside Hatfield regeneration plans	£50k - £500k

Revising crossing arrangements over the Abbey Line requires further investigation. Network Rail considers it a priority to remove this crossing. Alternatives include a new pedestrian and cycle bridge or diverting the Alban Way via the A5183 Holywell Hill.

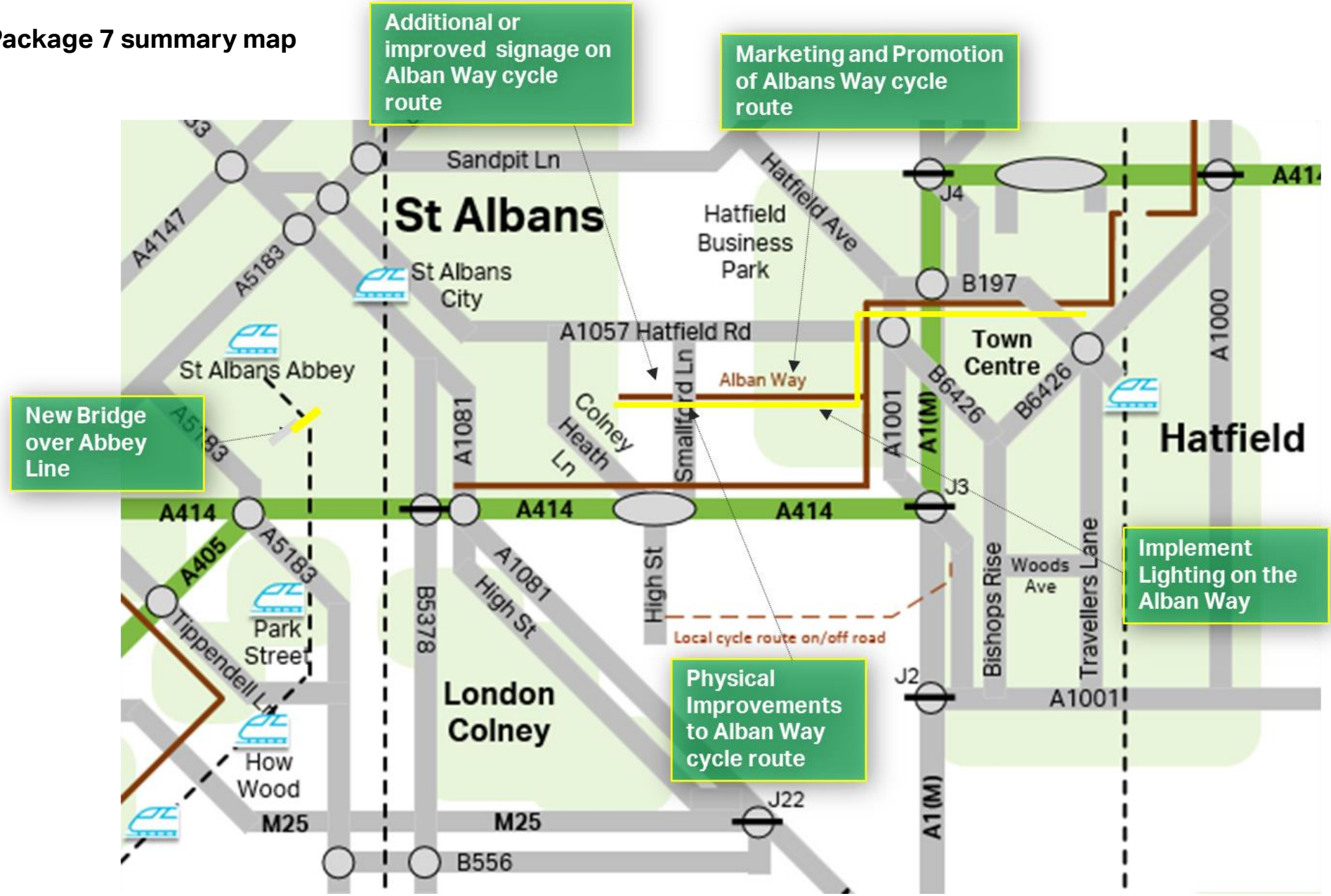
The proposed improvements to Alban Way have been developed with consideration of the Alban Way Greenspace Action Plan and the Rights of Way Improvement Plan.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK7	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£7m - £15m**

Segment 6: Park Street-St Albans-London Colney

Package 7 summary map



Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 8 – St Albans City Station Accessibility

The overarching aim of Package 8 is:

To improve accessibility by active modes to St Albans City station, particularly through strengthened connectivity between the station and the city centre.

The Package consists of:

- Improvement of footways, crossings, and urban realm, and implementation of wayfinding along Victoria Street between the station and the town centre.
- Development of cycle route infrastructure leading to the station along Grosvenor Road/Ridgmont Road.
- Increased provision for cycle parking at the station and safeguarded location for future increases.

The table below/overleaf summarises the interventions in this package.

A414 Package 8 - St Albans City Station Accessibility		
Name	**Short Description**	**Estimated Cost Range**
Victoria Street Footway Improvements	Improved and widened footways at the junctions with Ridgmont Road and Alma Road/ Beaconsfield Road and the link in between to increase capacity for high pedestrian volumes to/from the City station especially during peak periods	£500k - £1m
Victoria Street Wayfinding	Improved wayfinding between the City Centre and City Station	£50k - £500k
Pedestrian Crossing Improvements	Improve crossings at intersections with consistent type and placement of signals and signal call buttons, and pedestrian priority interventions such as zebra crossings at intersections and maintaining footway level/surfacing across minor roads	£1m - £2.5m

continued overleaf

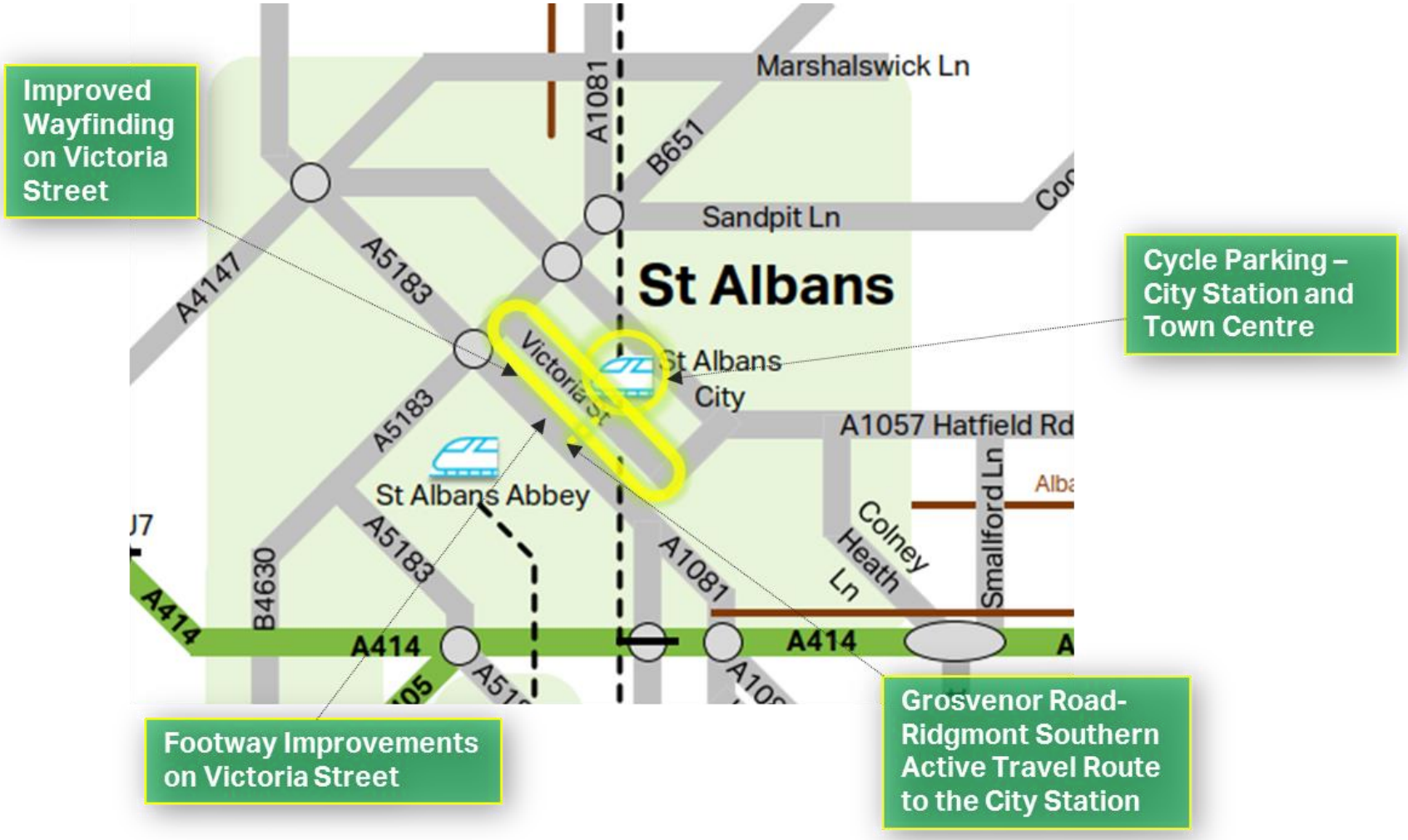
A414 Package 8 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Cycle Parking	Maintain or increase current and safeguard locations for future provision of cycle parking at St Albans City station and in the city centre	£50k - £500k
Grosvenor Road-Ridgmont southern active travel route to the station	Improved walking/cycling infrastructure along Grosvenor Road and Ridgmont Road for access to the City station	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 8	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£2m - £5m**

Segment 6: Park Street-St Albans-London Colney

Package 8 summary map



Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 9 – A0157 Hatfield Road Corridor (St Albans)

The overarching aim of Package 9 is:

To transform Hatfield Road into an attractive and inviting high street and enhance its function as an efficient public transport corridor.

The Package consists of:

- Implementation of bus priority measures along Hatfield Road, potentially facilitated by rearrangement of on-street parking as investigated through a parking study.
- Urban realm improvements along Hatfield Road, including footway and crossing upgrades and bus stop improvements.

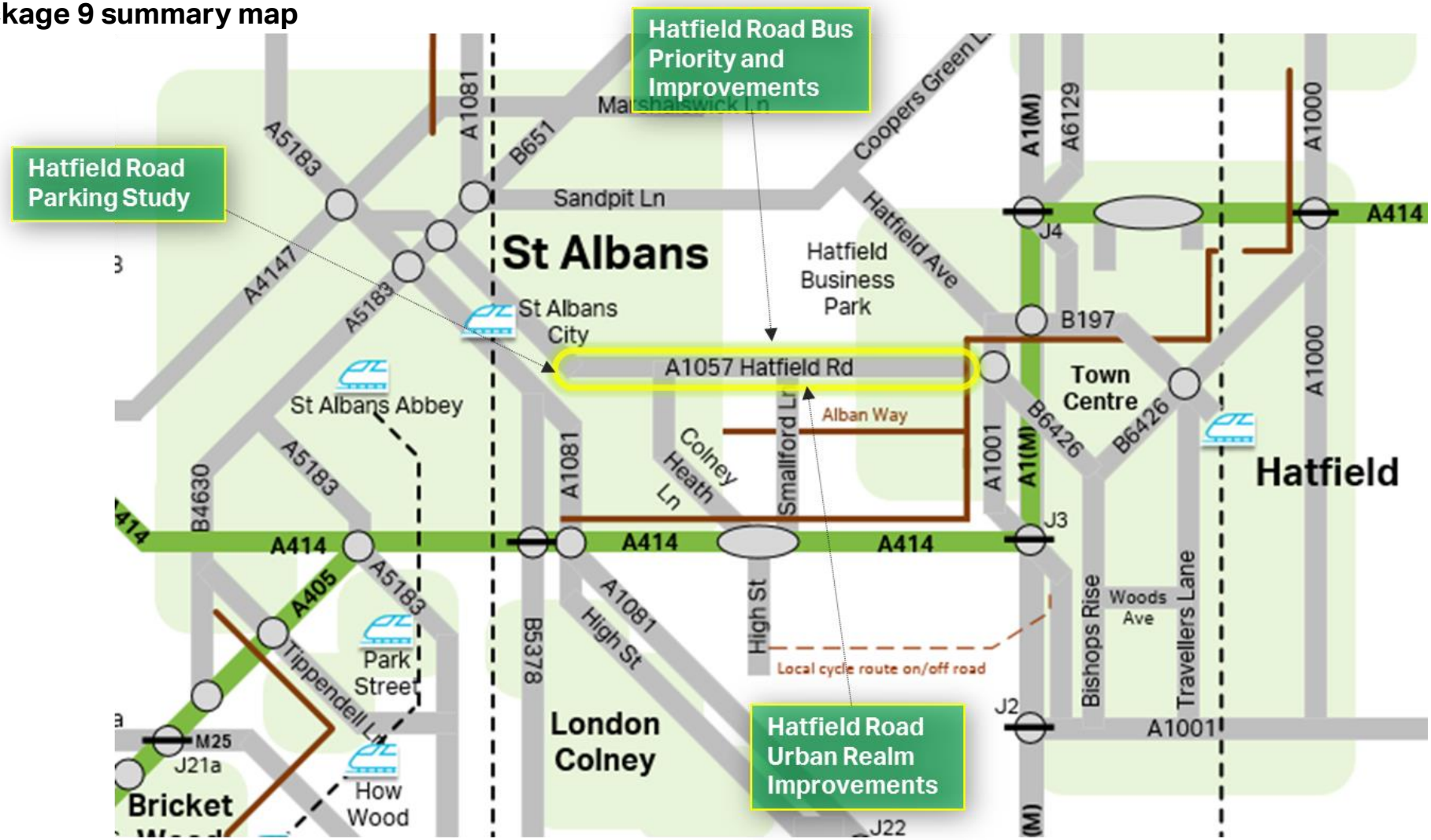
The table below/overleaf summarises the interventions in this package.

A414 Package 9– St Albans City Station Accessibility		
Name	**Short Description**	**Estimated Cost Range**
Hatfield Road Parking Study	Undertake a parking study to understand parking requirements and investigate potential for rearrangement of parking along Hatfield Road	£50k - £500k
Hatfield Road Bus Priority and Improvements	Investigate options for bus improvements, such as improved bus stops with real-time service information, and priority measures along Hatfield Road in order to improve reliability and reduce travel times on routes to Hatfield and Welwyn Garden City	£500k - £1m
Hatfield Road Urban Realm Improvements	Urban realm improvements along Hatfield Road to improve conditions for pedestrians and improve amenity of the high street.	£500k - £1m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 9	TOTAL INDICATIVE COST RANGE ESTIMATE	£1m - £3m

Package 9 summary map



Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 10 – London Road Corridor (St Albans)

The overarching aim of Package 10 is:

To make London Road a more attractive place for pedestrians and cyclists and improve reliability of journeys along the corridor.

The Package consists of:

- Development of new pedestrian crossing points, including at the Odyssey Cinema, potentially facilitated through a review of on-street parking.
- Junction upgrades and signal timing reconfiguration to improve conditions for pedestrians at the Peahen junction and Watsons Walk/Lattimore Road junctions.

The table below/overleaf summarises the interventions in this package.

A414 Package 10 - London Road Corridor - St Albans		
Name	**Short Description**	**Estimated Cost Range**
Odyssey Cinema revised footway and crossing	Widening of the footway outside the cinema and relocation of the signal controlled crossing north-westwards to improve safety for pedestrians entering/exiting the cinema.	£1m - £2.5m
Parking Review	A review of on-road parking provision in consultation with local communities and businesses along the corridor to help identify where it may be feasible to make improvements to conditions for cyclists and pedestrians including enlarged footways and cycle parking.	£500k - £1m
London Road/Watsons Walk/Lattimore Road junction alterations	Reconfigure the junction and remove guardrails to improve footways and provide new markings to reinforce existing off-road cycle route or mark it on the road. Widen footways where feasible especially to reduce crossing distances.	£1m - £2.5m
Peahen junction signal timing reconfiguration	Review the signal timings at the junction.	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 10	TOTAL INDICATIVE COST RANGE ESTIMATE	£4m - £9m

Package 10 summary map

Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 11 – A414 Highway Improvements (South of St Albans)

The overarching aim of Package 11 is:

> **To enhance the function of the A414 as a strategic east-west route in south central Hertfordshire through capacity and reliability upgrades.**

The Package consists of:

- A414 junction upgrades at Park Street, Napsbury, London Colney, and Colney Heath.
- Implementation of smart traffic management and signage improvements.

The table below/overleaf summarises the interventions in this package.

A414 Package 11 - A414 Highway Improvements (South of St Albans)		
Name	**Short Description**	**Estimated Cost Range**
A414/A1081 London Colney Roundabout Upgrade	Conversion of the existing signal-controlled roundabout into a signal-controlled hamburger junction which incorporates an east-west A414 through-link. Consideration should be given to the movement of bus services through the junction and how this could be optimised.	£2.5m - £5m
A414 Park Street Roundabout Improvements	An improvement to the existing roundabout layout with signal-control introduced to most if not all arms and some minor physical alterations to the junction's layout. Provision should be made for improved pedestrian and cyclist crossings.	£1m - £2.5m
A414 Colney Heath Longabout Improvements	A safety and capacity related improvement to the existing longabout junction which includes introducing a signal-controlled right turn 'cut-through' for traffic exiting from High Street towards A414 East.	£1m - £2.5m
Upgrade of the A414 Napsbury Junction	Improvements to the A414 Napsbury Junction in conjunction with a new PT facility, including upgrade of slip road merges and diverges to ensure they comply with current design standards	£1m - £2.5m

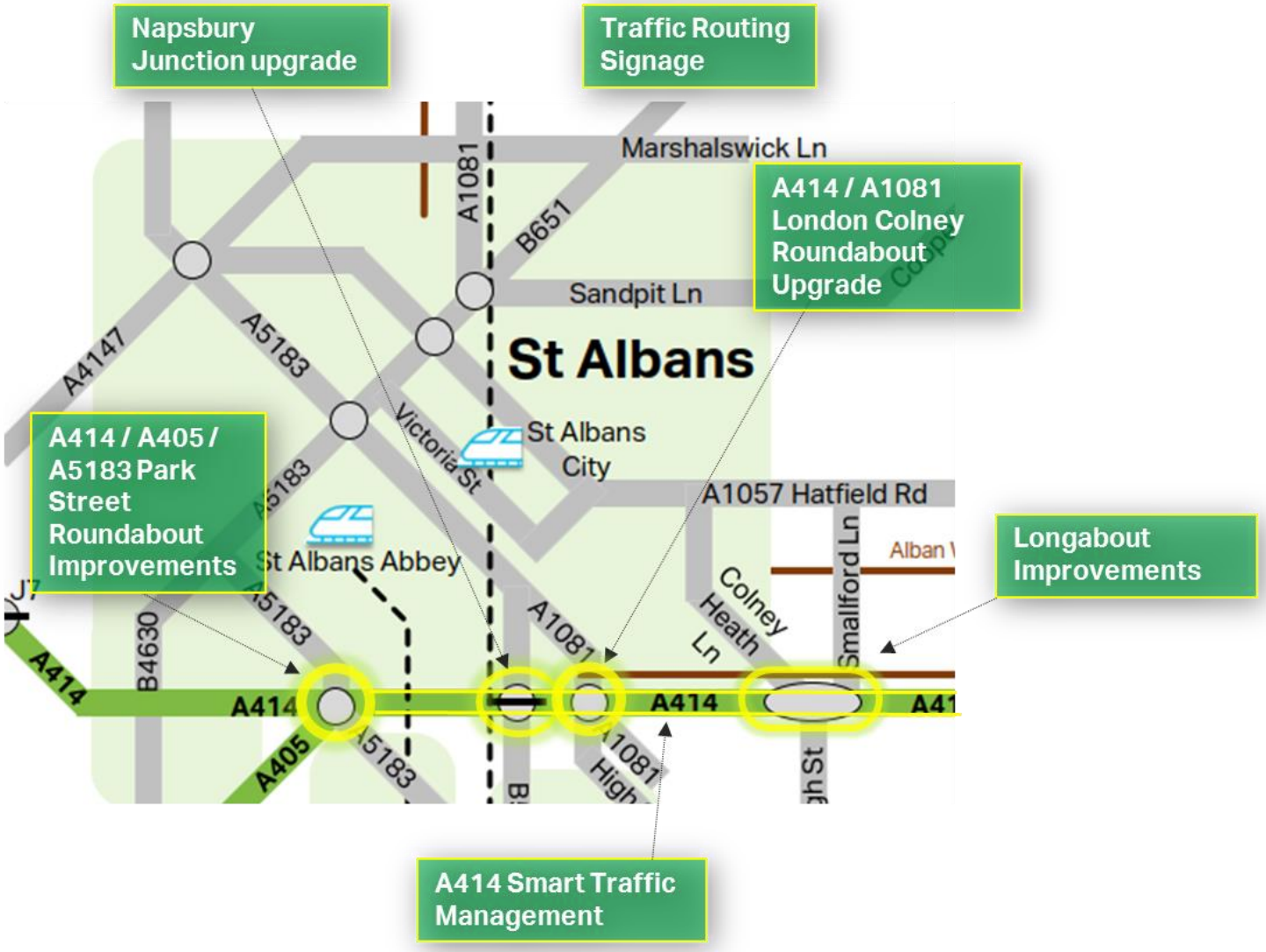
A414 Package 11 - A414 Highway Improvements (South of St Albans) (continued)		
Name	**Short Description**	**Estimated Cost Range**
A414 Smart Traffic Management	A review of traffic speed limits and measures required to improve compliance along the A414 Between the Park Street Roundabout and the A1(M) Junction 3. This could include adoption of 'expressway' type technology enhancements which can manage traffic speeds during busy periods and in response to incidents occurring downstream.	£1m - £2.5m
Traffic Routing Signage	Review and renew signage within St Albans and the surrounding area to ensure motorists are directed towards the A414 for making onward journeys on the A1(M) and to manage HGV flows.	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 11	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£7m - £16m**

Segment 6: Park Street-St Albans-London Colney

Package 11 summary map



Segment 6: Park Street-St Albans-London Colney

Packages Overview

Package 12 – London Colney Inter-Urban Connectivity

The overarching aim of Package 12 is:

To enhance the function of the A414 as a strategic east-west route in south central Hertfordshire through capacity and reliability upgrades

The Package consists of:

- A414 junction upgrades at London Colney, Park Street, and Colney Heath.
- Improved crossing facilities over the A414 linking London Colney and St Albans
- Improving the A414 cycle track between London Colney and Hatfield to facilitate cycle journeys.

The table below/overleaf summarises the interventions in this package.

A414 Package 12 - London Colney Inter-Urban Connectivity		
Name	**Short Description**	**Estimated Cost Range**
A414/A1081 London Colney Roundabout Upgrade	Conversion of the existing signal-controlled roundabout into a signal-controlled hamburger junction which incorporates an east-west A414 through-link. Consideration should be given to the movement of bus services through the junction and how this could be optimised.	£2.5m - £5m
B5378 Active Travel Corridor	Upgrade of existing footways to provide shared use pedestrian and cycle track along the entire length where feasible between the junction with St Annes Road (London Colney) and the A414 Napsbury Junction.	£1m - £2.5m
London Colney A414 Cycle/Pedestrian Bridge Improvements	Improvements to the existing overpass approaches including thinning vegetation to increase security, removal of kissing gates, wayfinding and signage, etc.	£50k - £500k
London Colney A414 Sustainable Travel Bridge	Investigate longer term options for a new, more attractive sustainable travel bridge over the A414 which will be capable at least of accommodating pedestrians and cyclists but also potentially future public transport and autonomous mass transit vehicles.	£2.5m - £5m

continued overleaf

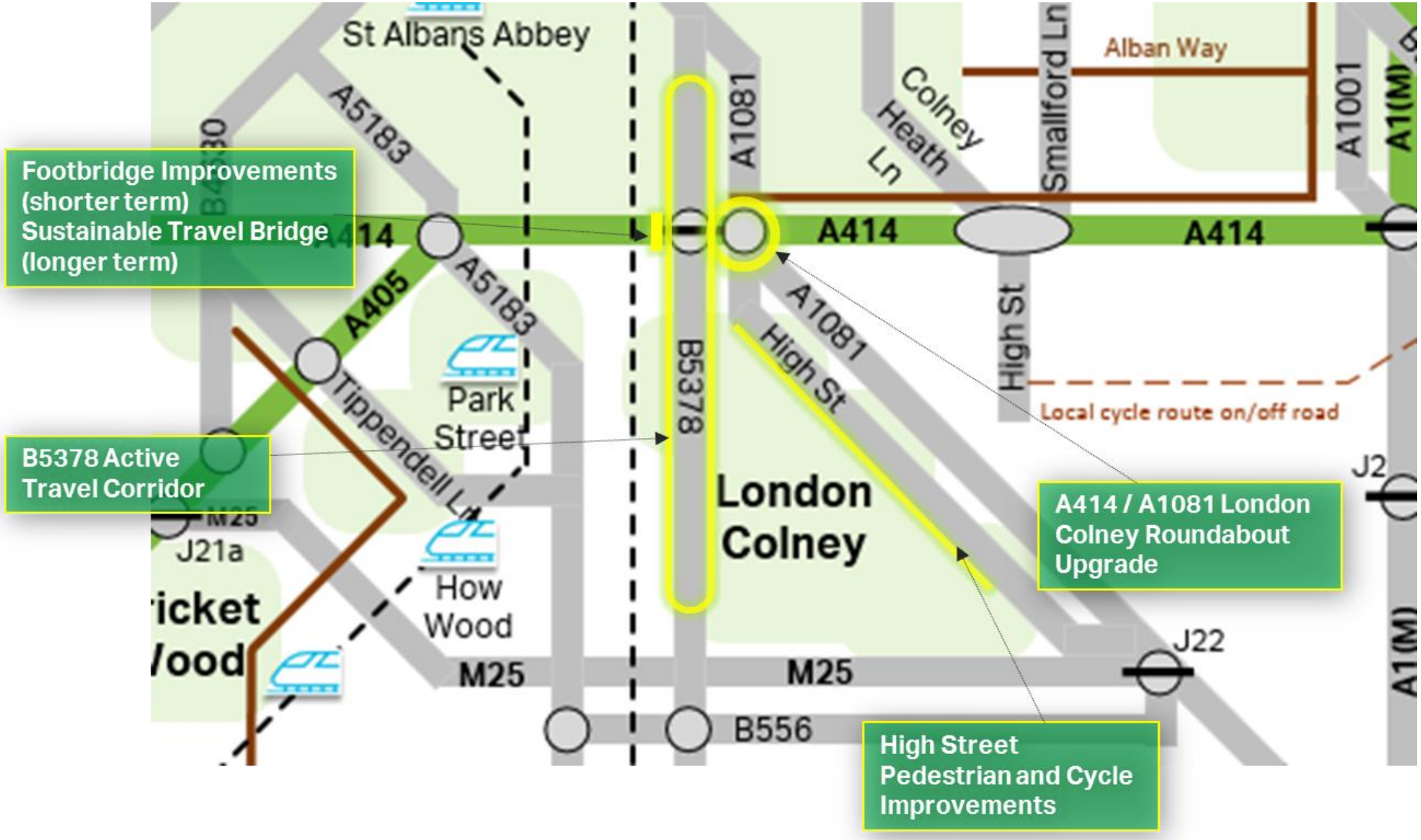
A414 Package 12 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Improved Pedestrian and Cycle Routes within London Colney on the High Street	Improved active travel infrastructure between London Colney and St Albans, including footways, cycle routes, crossings, lighting, signage, etc., to encourage more trips to be made by active	£1m - £2.5m
Improved London Colney-St Albans bus services	At least maintain or seek to improve service levels of all bus routes through London Colney including routes 84, 358, 602 and 658. Explore potential for existing enhanced or brand new service if further development proceeds within the northern part of Hertsmere (to form a sustainable transport corridor).	£500k - £1m
A414 Cycle Route upgrade Park Street-London Colney	Improve the cycle track alongside the A414 between the Park Street and London Colney Roundabouts.	£500k - £1m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 12	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£8m - £18m**

Segment 6: Park Street-St Albans-London Colney

Package 12 summary map



Segment 6 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

St Albans is a historic city and its centre is characterised by a network of narrow roads flanked by houses and shops. The main high street is heavily trafficked but also generates a great deal of footfall.

The railway stations in St Albans are located outside of the city centre within a 10-15 minute walk. St Albans City station is one of the busiest stations in Hertfordshire and is a major gateway for commuters travelling towards London. The station therefore generates lots of shorter distance trips from within St Albans and the surrounding area by a variety of travel modes. It is likely the car is considered a convenient method of travel even over quite short distances however there are excellent cycle parking facilities and a large bus interchange.

St Albans Abbey station terminus lies at the northern end of the Abbey Line. It is quite disconnected from the surrounding area and around 1km from the city centre along a very steep road. There is no public transport connection between the Abbey and City stations although a direct shuttle bus service has been trialled in the past. Better cross-town public transport and active mode links are envisaged to promote connectivity between the two stations and attract people out of their cars for shorter journeys occurring within St Albans.

Local bus operators can experience delays to their services as a result of congestion. Bus priority measures should therefore be considered in key junctions to improve journey times and reliability.

The A5183 and A1081 cross-country routes pass through St Albans. They are not intended to facilitate through traffic as alternative roads such as the M1 and A414 should cater for these types of trips. However the local road network is very sensitive to congestion occurring both within and outside St Albans. For instance, when incidents occur on the M1, traffic can divert through St Albans along the A5183 and A1081, creating severe traffic congestion

Identifying the appropriate place and movement function of the A1081 (St Peter's Street, Chequers Street, London Road), A1583 (Verulam Road, Holywell Hill) in addition to the A1057 Hatfield Road and B691 Victoria Street, among others, which recognises and prioritises the local functions and needs of St Albans over those of facilitating high volumes of traffic, some of which could shift to more sustainable alternatives) will be an ongoing priority.

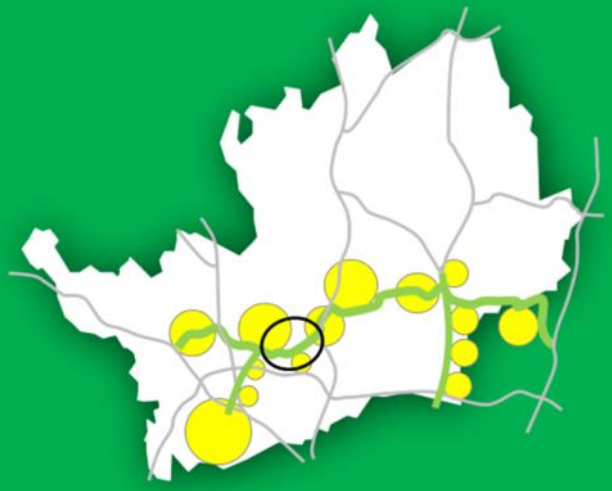
Consideration will need to be given to how a Mass Rapid Transit system, in whatever form it may take, can operate efficiently through St Albans, given the local congestion issues and more limited opportunities to make substantial changes to the layout of roads.

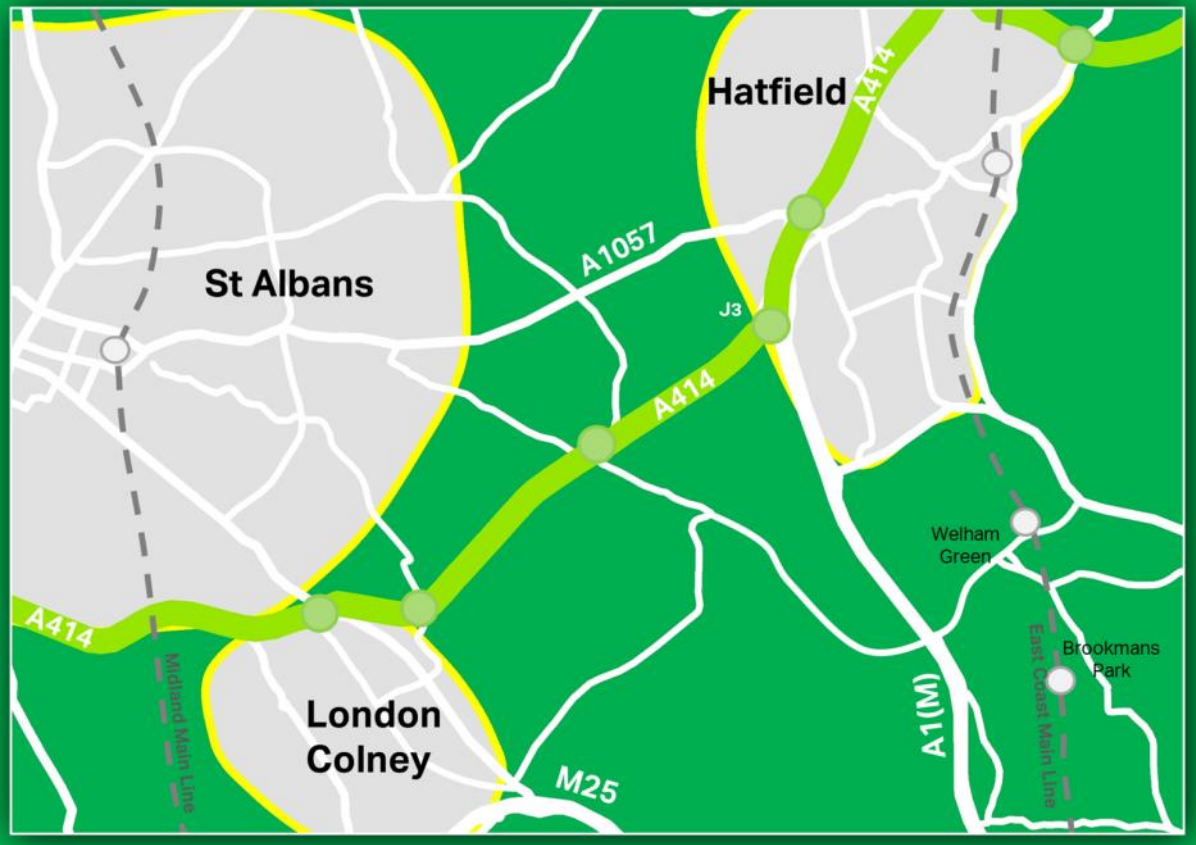
To the south of St Albans, the A414 will need to continue functioning as a more strategic, higher-speed, higher-capacity route for inter-urban travel by car. Connectivity by sustainable travel modes between St Albans and surrounding villages and towns will also remain a priority.

A414 Corridor Segment

7

St Albans-London Colney-Hatfield





Segment 7: St Albans-London Colney-Hatfield

St Albans and Hatfield are two of the largest settlements on the corridor and quite closely spaced. They are primarily linked by the A1057 Hatfield Road, the Alban Way cycle route and the A414 dual carriageway. The A1057 is characterised by ribbon development on either side, including residential and commercial properties, meaning that it is harder to distinguish the outer suburbs of St Albans from those of Hatfield.

London Colney is located to the south of St Albans and is connected to the wider highway network via the A414/A1081/High Street London Colney Roundabout. It is also linked to both St Albans and Hatfield via local bus services.

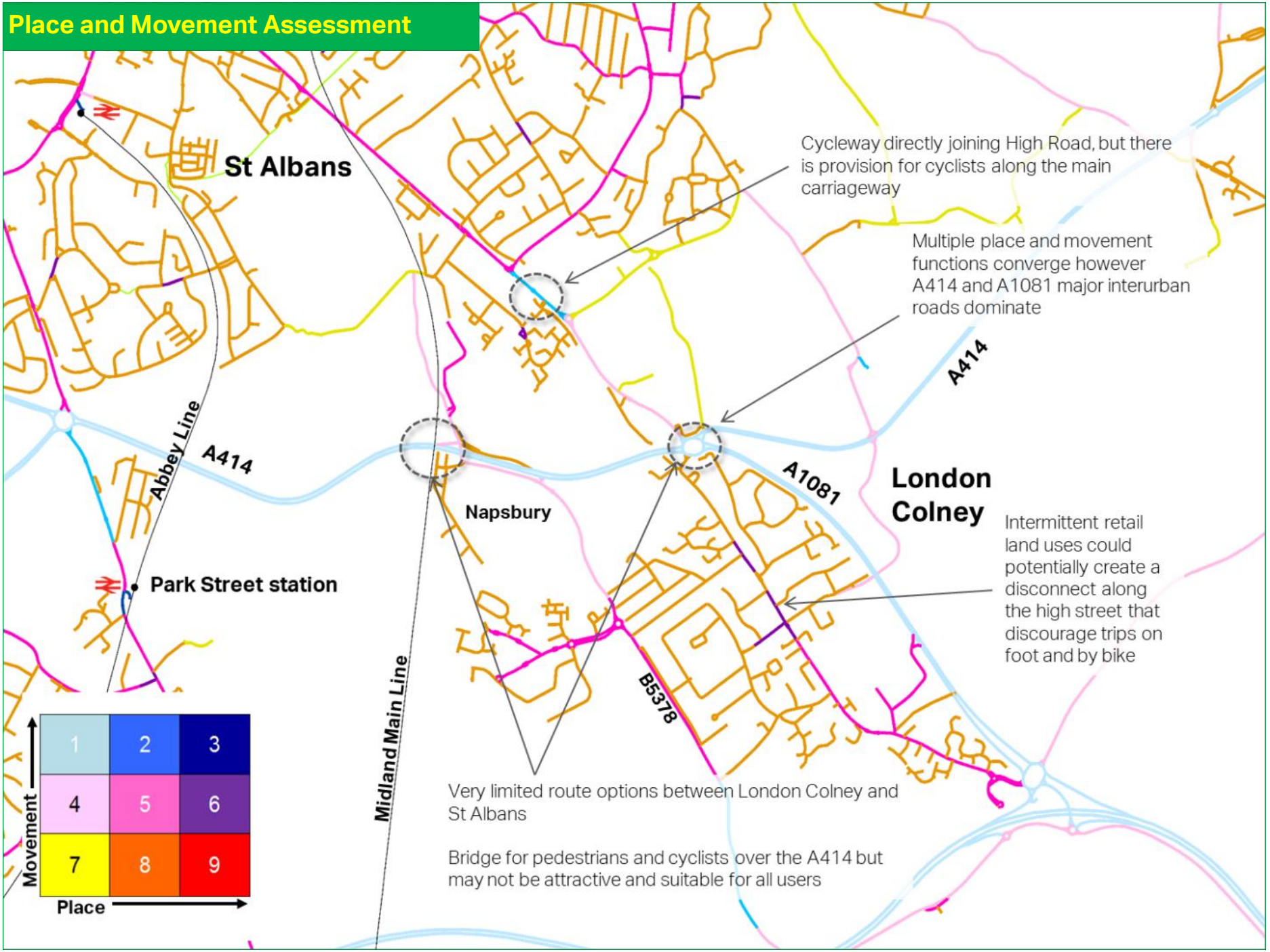
There are more local, well-used routes in the area. The Sandpit Lane -Coopers Green Lane-Hatfield Avenue route is an alternative means of reaching Hatfield Business Park and University campus, as well as a less direct route between St Albans, A1(M) Junction 4. and Welwyn Garden City. Oaklands Lane-Station Road-Smallford Lane links eastern/north-eastern suburbs of St Albans, the A1057 and A414.

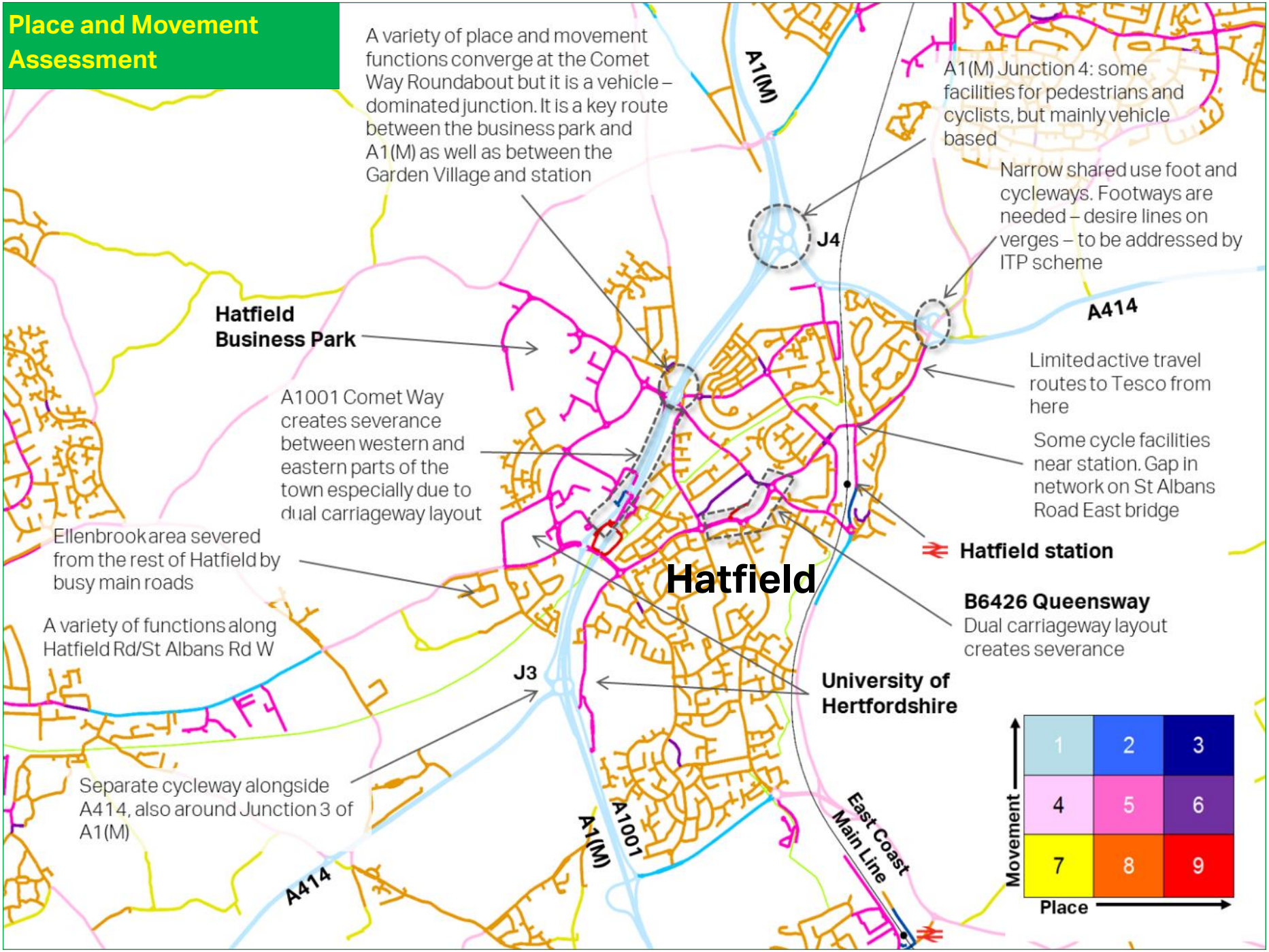
The table to the right indicates the key characteristics and challenges within this segment. The trip distribution specifically refers to the section of the A414 dual carriageway which carries mainly longer distance trips. In contrast, the A1057 Hatfield Road will more likely be used for shorter distance trips, however it will also perform a function of providing access to longer distance routes such as the A414 and A1(M).

Sandpit Lane and Hatfield Road will be a focus for housing growth in the shorter term and are expected to facilitate new trips heading towards St Albans, Hatfield and onwards to more strategic routes such as the A414 and A1(M). Getting as many of these new trips onto more sustainable modes, and encouraging mode shift for those already travelling by car along local routes such as Hatfield Road will be important to help reduce the impact of traffic on these local routes. This is particularly important given they already experience peak period congestion and opportunities to provide additional highway capacity are limited and undesirable given the close proximity of residential properties.

Segment 7 Summary (see Evidence Report for detail)			
Trip Distribution	Long (>15km) 92%	Medium (5-15km) 7%	Short (0-5km) 1%
Key Infrastructure and Services	**Highway** • A414 is dual-carriageway with a 70mph speed limit, except through the London Colney Longabout where it is 50mph. • A1057 runs parallel to A414; has speed limit of 40mph. • A414 is used by strategic traffic, most between the M25, M1 and A1(M).		
	Public Transport • A414 is served by bus 635 (Hatfield - Watford) and is crossed by routes 230 and 305. • Hatfield Rd (A1057) is a major bus corridor served by the 300, 301, 305, 601, 602, 653 and 724.		
	Walking/Cycling • The Alban Way (off-road cycle route). • A predominantly off-road cycle path adjacent to A414. • On-road cycle route between Colney Heath and the Alban Way in St Albans.		
Segment Challenges	**Highway Issues** • Delays at London Colney Roundabout, London Colney Longabout and at A1(M) Junction 3. • Trips are strategic, between M1, M25 and A1(M). • A414 acts as an alternative to M25 in times of disruption. • Several HCC defined hazardous sites.		
	Public Transport Issues • London Colney is not connected to Hatfield by any direct PT links.		
	Walking/Cycling Issues • Despite the presence of an off-road cycle track between St Albans and Hatfield, the rate of cycling between the towns is only 4.5%.		

Place and Movement Assessment




Place and Movement Assessment
A variety of place and movement functions converge at the Comet Way Roundabout but it is a vehicle – dominated junction. It is a key route between the business park and A1(M) as well as between the Garden Village and station
A1(M)
A1(M) Junction 4: some facilities for pedestrians and cyclists, but mainly vehicle based
Narrow shared use foot and cycleways. Footways are needed – desire lines on verges – to be addressed by ITP scheme
J4
A414
Hatfield Business Park
A1001 Comet Way creates severance between western and eastern parts of the town especially due to dual carriageway layout
Limited active travel routes to Tesco from here
Some cycle facilities near station. Gap in network on St Albans Road East bridge
Ellenbrook area severed from the rest of Hatfield by busy main roads
Hatfield station
Hatfield
B6426 Queensway
Dual carriageway layout creates severance
A variety of functions along Hatfield Rd/St Albans Rd W
J3
University of Hertfordshire
Separate cycleway alongside A414, also around Junction 3 of A1(M)
A414
A1(M)
A1001
East Coast Main Line
Movement
Place
1
2
3
4
5
6
7
8
9

Segment 7: St Albans-London Colney-Hatfield

Segment 7 Priorities

A local and strategic interurban network for journeys by bus, bike and by car, prioritising better access to local services and jobs and facilitating longer distance journeys on the A414.

- A414 functions as the strategic link for inter-urban and longer distance through traffic.
- A1057 Hatfield Road/St Albans Road West will function as a local link for shorter distance journeys between eastern St Albans and Hatfield, catering for local access to the business park and university campus, catering for multiple modes with a focus on walking, cycling, local bus services, lower traffic speeds and a heightened sense of place.
- An enhanced Alban Way cycle route will cater for inter-urban, traffic-free cycle journeys for commuting and leisure with improved connectivity to St Albans' two railway stations, University of Hertfordshire and Hatfield business park, and Hatfield railway station.
- Improvements at key junctions on the A414 to reduce congestion and delays.

Segment 7: St Albans-London Colney-Hatfield

Packages Overview

Package 9 – A0157 Hatfield Road Corridor (St Albans)

The overarching aim of Package 9 is:

To transform Hatfield Road into an attractive and inviting high street and enhance its function as an efficient public transport corridor.

The Package consists of:

- Implementation of bus priority measures along Hatfield Road, potentially facilitated by rearrangement of on-street parking as investigated through a parking study.
- Urban realm improvements along Hatfield Road, including footway and crossing upgrades and bus stop improvements.

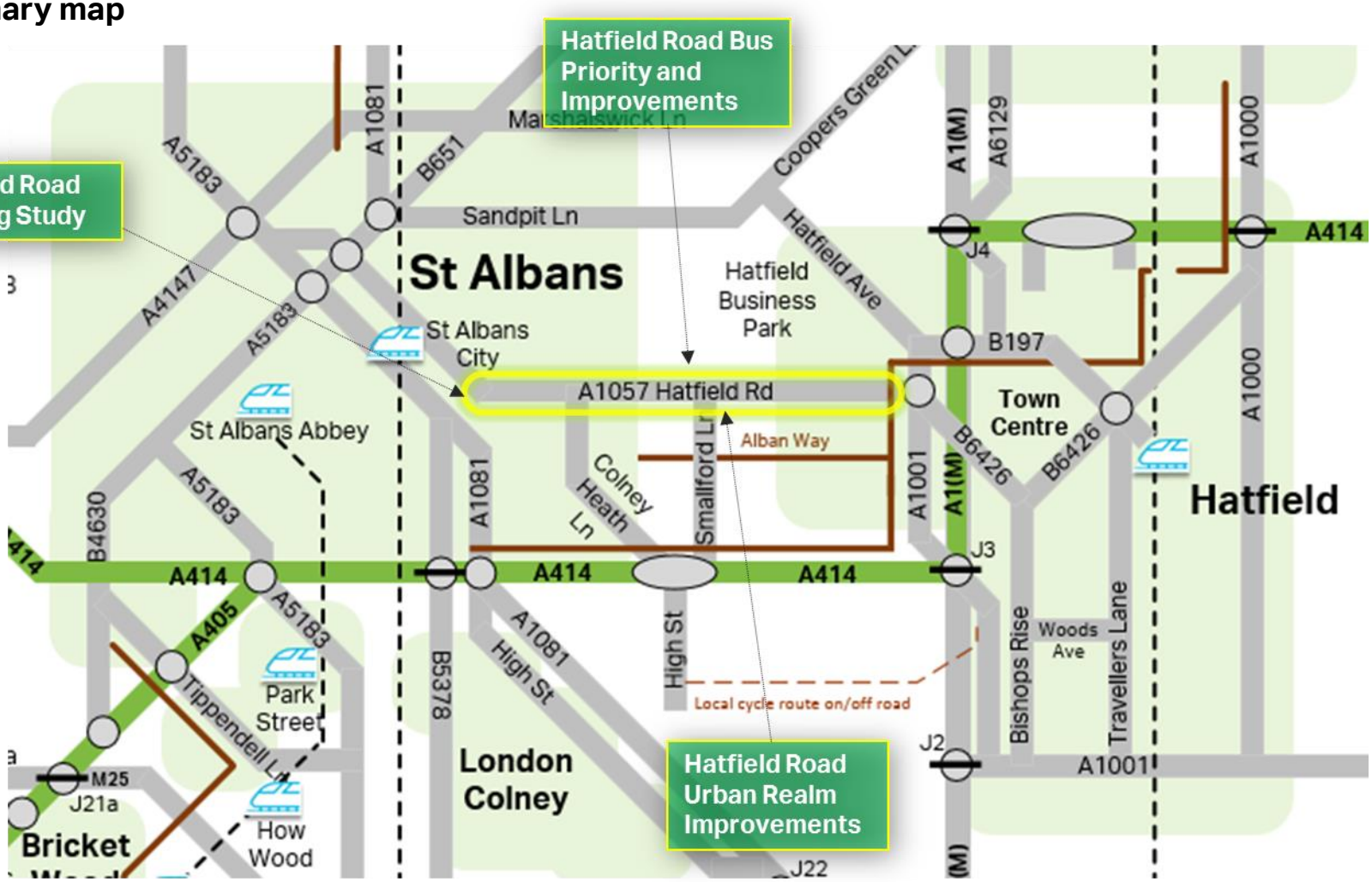
The table below/overleaf summarises the interventions in this package.

A414 Package 9– St Albans City Station Accessibility		
Name	**Short Description**	**Estimated Cost Range**
Hatfield Road Parking Study	Undertake a parking study to understand parking requirements and investigate potential new parking management measures that could be introduced	£50k - £500k
Hatfield Road Bus Priority and Improvements	Investigate options for bus improvements, such as improved bus stops with real-time service information, and priority measures along Hatfield Road in order to improve reliability and reduce travel times on routes to Hatfield and Welwyn Garden City	£500k - £1m
Hatfield Road Urban Realm Improvements	Provide urban realm improvements along Hatfield Road to improve conditions for pedestrians and improve amenity of the high street.	£500k - £1m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 9	TOTAL INDICATIVE COST RANGE ESTIMATE	£1m - £3m

Package 9 summary map



Segment 7: St Albans-London Colney-Hatfield

Packages Overview

Package 12 – London Colney Inter-Urban Connectivity

The overarching aim of Package 12 is:

To enhance the function of the A414 as a strategic east-west route in south central Hertfordshire through capacity and reliability upgrades

The Package consists of:

- A414 junction upgrades at London Colney, Park Street, and Colney Heath.
- Improved crossing facilities over the A414 linking London Colney and St Albans
- Improving the A414 cycle track between London Colney and Hatfield to facilitate cycle journeys.

The table below/overleaf summarises the interventions in this package.

A414 Package 12 - London Colney Inter-Urban Connectivity		
Name	**Short Description**	**Estimated Cost Range**
A414/A1081 London Colney Roundabout Upgrade	Conversion of the existing signal-controlled roundabout into a signal-controlled hamburger junction which incorporates an east-west A414 through-link. Consideration should be given to the movement of bus services through the junction and how this could be optimised.	£2.5m - £5m
B5378 Active Travel Corridor	Upgrade of existing footways to provide shared use pedestrian and cycle track along the entire length where feasible between the junction with St Annes Road (London Colney) and the A414 Napsbury Junction	£1m - £2.5m
London Colney A414 Cycle/Pedestrian Bridge Improvements	Improvements to the existing overpass approaches including thinning vegetation to increase security, removal of kissing gates, wayfinding and signage, etc.	£50k - £500k
London Colney A414 Sustainable Travel Bridge	Investigate longer term options for a new, more attractive sustainable travel bridge over the A414 which will be capable at least of accommodating pedestrians and cyclists but also potentially future PT and autonomous mass transit vehicles	£2.5m - £5m

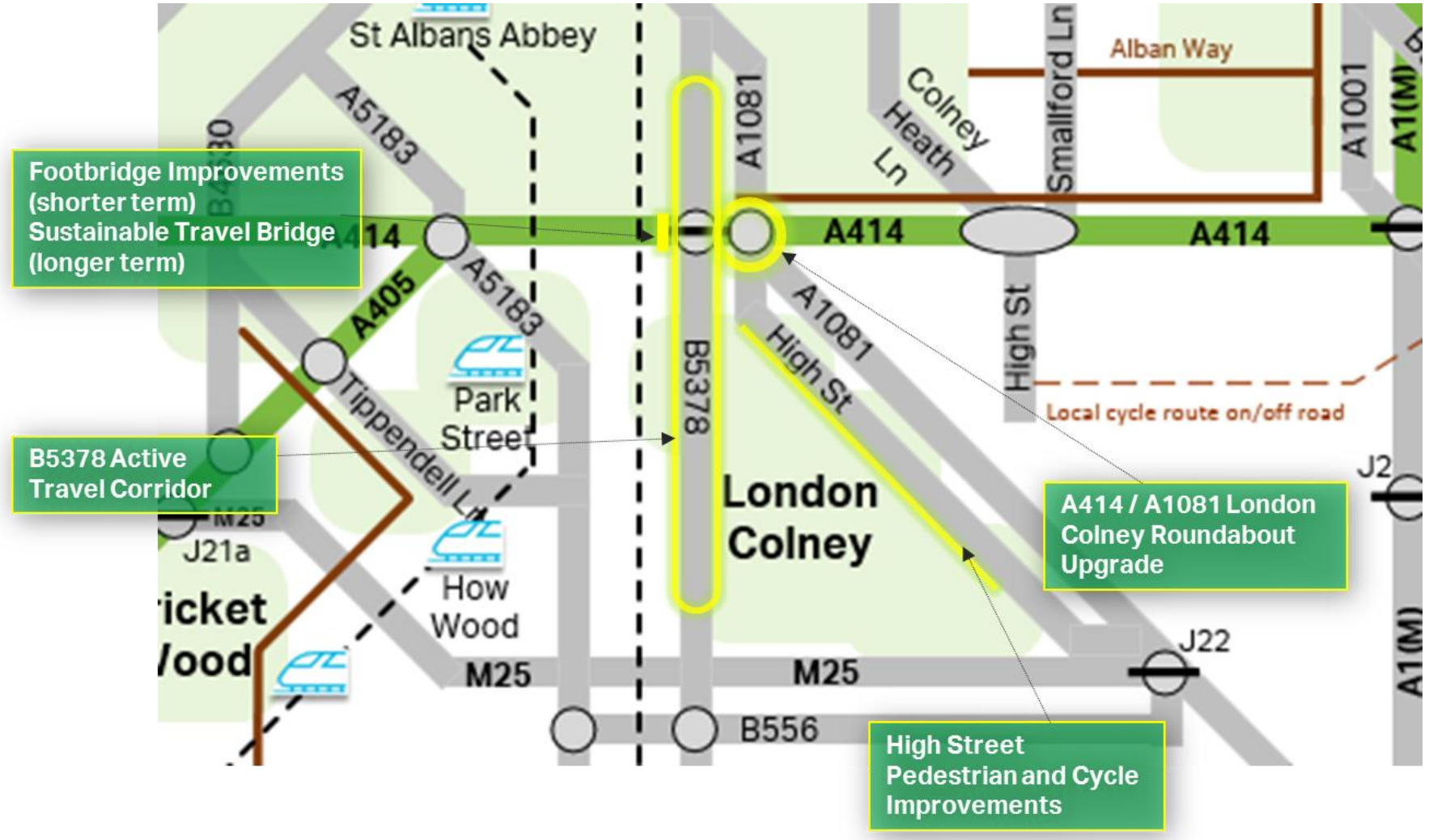
A414 Package 12 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Improved Pedestrian and Cycle Routes within London Colney on the High Street	Improved active travel infrastructure between London Colney and St Albans, including footways, cycle routes, crossings, lighting, signage, etc., to encourage more trips to be made by active	£1m - £2.5m
Improved London Colney-St Albans bus services	At least maintain or seek to improve service levels of all bus routes through London Colney including routes 84 and 658. Explore potential for existing enhanced or brand new service if development comes forward in the northern part of Hertsmere (to form a sustainable transport corridor).	£500k - £1m
A414 Cycle Route upgrade Park Street-London Colney	Improve the cycle track alongside the A414 between the Park Street and London Colney Roundabouts.	£500k - £1m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 12	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£8m - £18m**

Segment 7: St Albans-London Colney-Hatfield

Package 12 summary map



Segment 7: St Albans-London Colney-Hatfield

Packages Overview

Package 13 – St Albans-Hatfield Local Connectivity

The overarching aim of Package 13 is:

To enhance local transport between St Albans and Hatfield and facilitate growth along the Sandpit Lane-Coopers Green Lane corridor.

The Package consists of:

- Development of an active transport corridor along Coopers Green Lane with a link to Hatfield Business Park, including cycling and footway infrastructure supported by a reduction in the speed limit.
- Improvements to traffic routing signage to ensure longer distance strategic trips are routed to strategic roads including the A414.

The table overleaf summarises the interventions in this package.

A414 Package 13– St. Albans to Hatfield Local Connectivity		
Name	**Short Description**	**Estimated Cost Range**
Ellenbrook Lane/St Albans Road Roundabout	Convert the existing roundabout into a signal-controlled crossroads. Provide an additional lane on the eastbound approach to add capacity and prevent right turning traffic blocking back.	£2.5m - £5m
Coopers Green Lane Active Travel Infrastructure SW of Hatfield Avenue (towards St Albans)	Provide new cycling and footway infrastructure along Coopers Green Lane	£1m - £2.5m

Continued overleaf

A414 Package 13– St. Albans to Hatfield Local Connectivity (continued)		
Name	**Short Description**	**Estimated Cost Range**
Coopers Green Lane Speed Limit Reduction	Reduced speed limit along Coopers Green Lane to support active transport infrastructure and reflect a more urbanised environment along the route due to nearby development	£50k - £500k
Traffic Routing Signage	Review and renew signage within St Albans and the surrounding area to ensure motorists are directed towards the A414 for making onward journeys on the A1(M).	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 13	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£4m - £9m**

Segment 7: St Albans-London Colney-Hatfield

Package 13 summary map

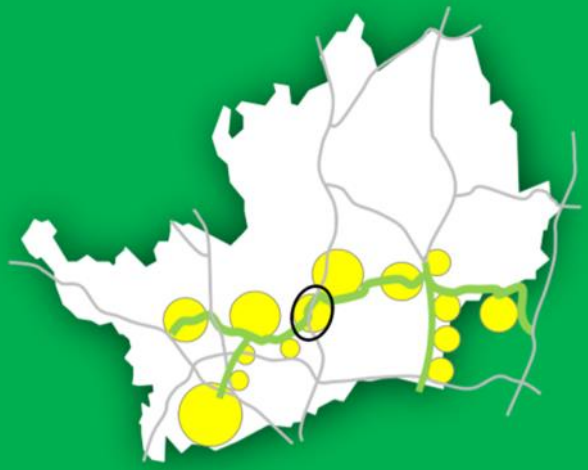
Segment 7 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

The small town of London Colney lies to the south of St Albans and is served primarily by road and by bus with links towards St Albans as well as Potters Bar and areas of southern Hertfordshire. Whilst the Midland Main Line passes to the west of the town, London Colney is not served directly by rail. There are emerging plans to expand London Colney as well as the potential for one or more standalone garden community within Hertsmere to the east and south of London Colney. This will place additional demand on the surrounding transport network. As a major rail hub, St Albans City station on the Midland Main Line is likely to be a major attractor for rail trips, as could Potters Bar station on the East Coast Main Line. In the shorter term, strengthened bus services and improved cycle links with St Albans will be the greatest priority. With a population increase, travel patterns may change and whilst St Albans and Greater London are likely to be major attractors of trips, Hatfield business park / University of Hertfordshire, as well as Maylands / Hertfordshire IQ Enterprise Zone and Watford could also become major attractors for new residents accessing jobs. East-west public transport provision is currently quite limited however the proposals put forward in this strategy seek to address this. If demand is sufficient, there could be a longer term desire for a new railway station on the Midland Main Line to serve London Colney and wider surrounding development. If such a station was desirable and taken forward, east-west connectivity in terms of high quality cycle routes, a Mass Rapid Transit system (depending on its form and alignment) and attractive crossing points over or beneath the A414 will be needed.

The A1057 Hatfield Road / St Albans Road West links Hatfield and St Albans. It is an intensively used corridor for shorter and longer distance trips by a variety of modes for different journey purposes including commuting, access to the University of Hertfordshire, shopping and logistics. There is limited scope to enhance the road to provide additional capacity and this may not be desirable from a place and movement perspective which should aim to give greater priority to the local functions of the road and to discourage the use of the road for through trips, including those travelling from western parts of St Albans (or beyond) to the A1(M) or areas along the A414 corridor east of Hatfield. The interventions put forward in the strategy work towards this goal and should be reinforced further with the emerging housing developments around St Albans and Hatfield.

A414 Corridor Segment



8

Hatfield

Segment 8: Hatfield

The town of Hatfield lies centrally within the corridor, at the crossroads between the A414 and A1(M). It is where the A414 makes a dog leg, requiring motorists travelling east-west to leave the A414, join a section of the A1(M) and then leave the motorway to resume a journey on the A414. Hatfield is a planned New Town and lies mainly to the east of the A1(M) with a small town centre.

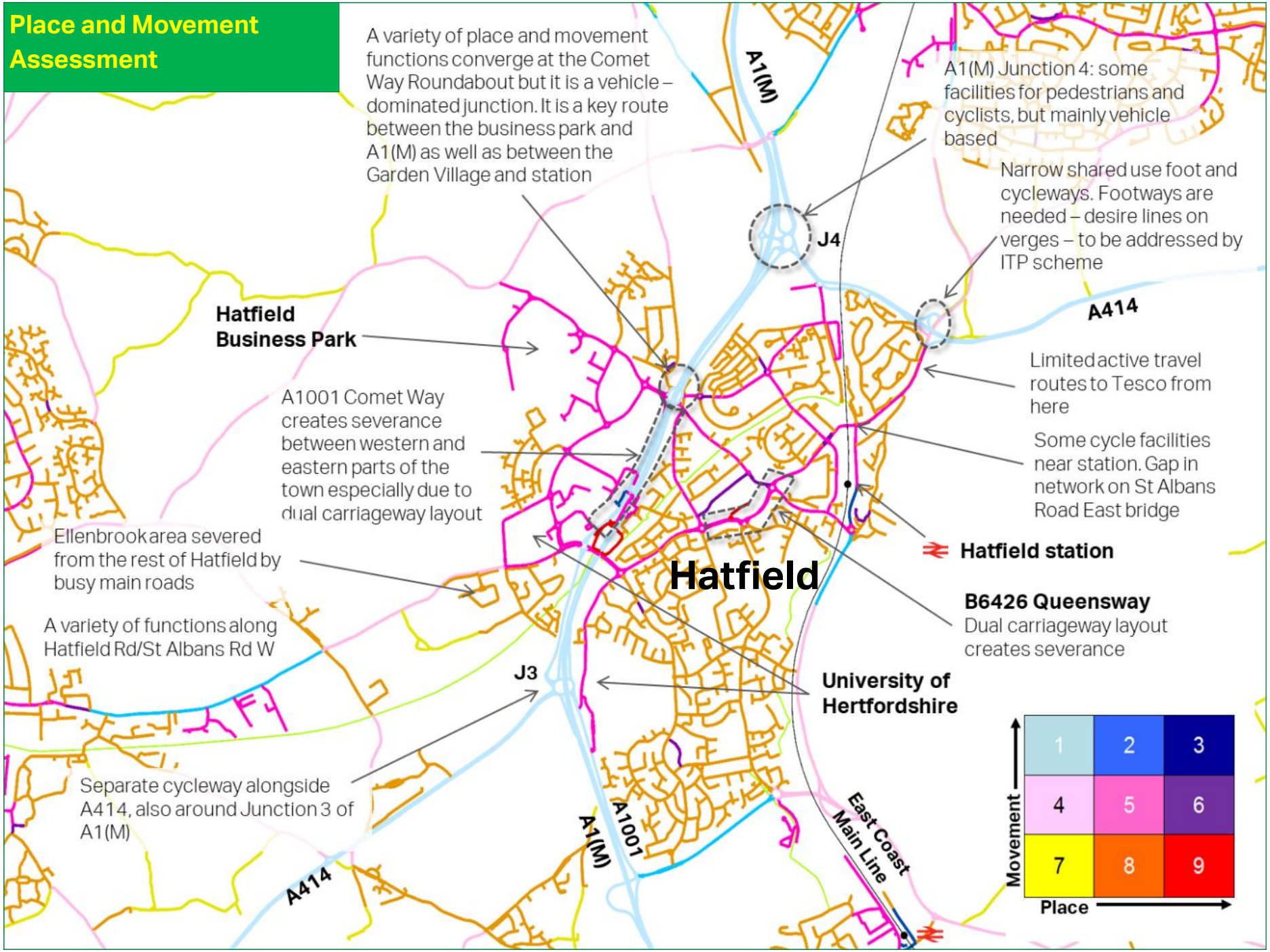
The railway station (on the East Coast Main Line) is on the eastern side of Hatfield and faces away from the town. A section of the A1(M) is located within a tunnel above which is the large Galleria shopping centre and multiplex cinema. To the west of the A1(M) is the De Havilland campus of the Hertfordshire of University and the large Hatfield Business Park site. Both are important economically to the whole of Hertfordshire. Hatfield is located very close to St Albans to the west and Welwyn Garden City to the north. Other key important transport links are the A1057 Hatfield Road/St Albans Road West, A1001 Comet Way and the A1000 Great North Road.

Two large junctions provide access to the A1(M) - Junction 3 towards the southern end of the town, linked to the A414 West, and Junction 4 to the north of the town, linked to the A414 East. Both are susceptible to traffic congestion.

There is planned housing growth and regeneration in and around Hatfield. The Hatfield 2030+ proposals seek to bring forward major changes in Hatfield including the Town Centre. The North West Hatfield urban extension will bring forward more housing adjacent to the business park. Separate to the town, the Symondshyde village development will bring forward housing in a more rural setting. It will be crucial for high quality sustainable transport connections to be provided between new developments and key locations including the business park, university campuses, Galleria, town centre and railway station, as well as to neighbouring urban settlements.

Segment 8 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 98%	Medium (5-15km) 2%	Short (0-5km) 0%
Key Infrastructure and Services	**Highway** • A1(M) connects the Western and Eastern sections of the A414. • Segment includes a 3/4 mile tunnel adjacent to Hatfield as well as Junction 3 and 4. • Users of the A1(M) are strategic in nature (98% of trips are >15km). • Comet Way runs parallel to A1(M) and has a 50mph speed limit.		
	Public Transport • National Express Coach 448 runs along the A1(M) • The A414 Corridor is aligned parallel to the East Coast Mainline. • Bus services parallel to the A1(M) run through Hatfield Business Park along the A1001 Comet Way.		
	Walking/Cycling • Off-road cycle route runs parallel to the A1(M) and have interchange with the Alban Way.		
Segment Challenges	**Highway Issues** • A1(M) junctions 3 and 4 experience congestion at peak times. • Several HCC defined hazardous sites.		
	Public Transport Issues • Poor public transport connectivity between Hatfield station and the northern parts of Hatfield Business Park. • See segment 9 for details of PT challenges in Hatfield and Welwyn Garden City.		
	Walking/Cycling Issues • Several large and congested junctions that cause local severance in the cycle route network.		

Place and Movement Assessment



Segment 8: Hatfield

Segment 8 Priorities

An urban transport and travel network facilitating both local and interurban journeys, focussing on increased use of non-car modes for local journeys within the town

- The A1(M) will continue to be used chiefly for longer distance car trips including journeys along the A1(M) corridor to/from north and south of Hatfield as well as journeys between A414 East and A414 West.
- A1(M) Junctions 3 and 4 will continue to prioritise motorised traffic but should also cater for local bus services and potential Mass Rapid Transit services (depending on form and alignment). For Junction 4, the safe crossing of pedestrians and cyclists between the A6129 (Stanborough) and A1001 (Comet Way) should be preserved.
- A1001 Comet Way will be a multi-modal, local distributor route balancing the needs of pedestrians, cyclists, buses, cars and business related traffic primarily for local residents, visitors to the Galleria, employees at the business park, and students and staff at UoH. There will be a presumption against the use of this road for longer distance through traffic except during major disruptive incidents on the A1(M) between Junctions 3 and 4.
- An improved network of interchanges around the University campus, business park and Galleria will cater for local bus services and potentially a Mass Rapid Transit system.
- The urban network of Hatfield will incorporate better facilities for pedestrians and cyclists. The B6426 Cavendish Way/Queensway as well as other key distributor roads in the town will have a renewed place function, increasing the priority afforded to pedestrian, cyclists and buses and minimising the severance caused by traffic. This corridor will be preserved for local movements, with measures in place to actively discourage longer distance through movements for example those diverting off the A414 and A1(M).
- There will be improved local connectivity for journeys on foot, by bike and by bus between Hatfield Railway Station, Town Centre and the business park/University of Hertfordshire, with a focus in particular on the B197 Wellfield Road-French Horn Lane corridor.

Segment 8: Hatfield

Packages Overview

Package 14 – Hatfield - College Lane/Cavendish Way Corridor

The overarching aim of Package 14 is:

To reduce severance and improve conditions for pedestrians and cyclists along the College Lane/Cavendish Way corridor, enhancing connectivity between the university campuses and Hatfield town centre.

The Package consists of:

- Junction improvements along the corridor that increase priority for active transport modes.
- Cycle route improvements, including a new cycle path along Cavendish Way and general improvements and maintenance.
- Cycle hire and cycle parking locations at key destinations along the corridor.
- Development of a new active travel bridge across the A1(M).
- Upgraded road crossings.

The table below / overleaf summarises the interventions in this package.

A414 Package 14 – Hatfield-College Lane/Cavendish Way Corridor		
Name	**Short Description**	**Estimated Cost Range**
Improve cycling and pedestrian priority	Remove the existing railing around the crossing points and in the central island to open the area up to other modes. Improve the cycling environment by connecting the various cycle routes. Improve the crossing points by expanding the width of the crossings and remarking the carriageway with alternative materials to highlight crossing locations.	£1m - £2.5m
Upgrade roundabout to signalised	Replace the existing roundabouts with signalised junctions	£2.5m - £5m

continued overleaf

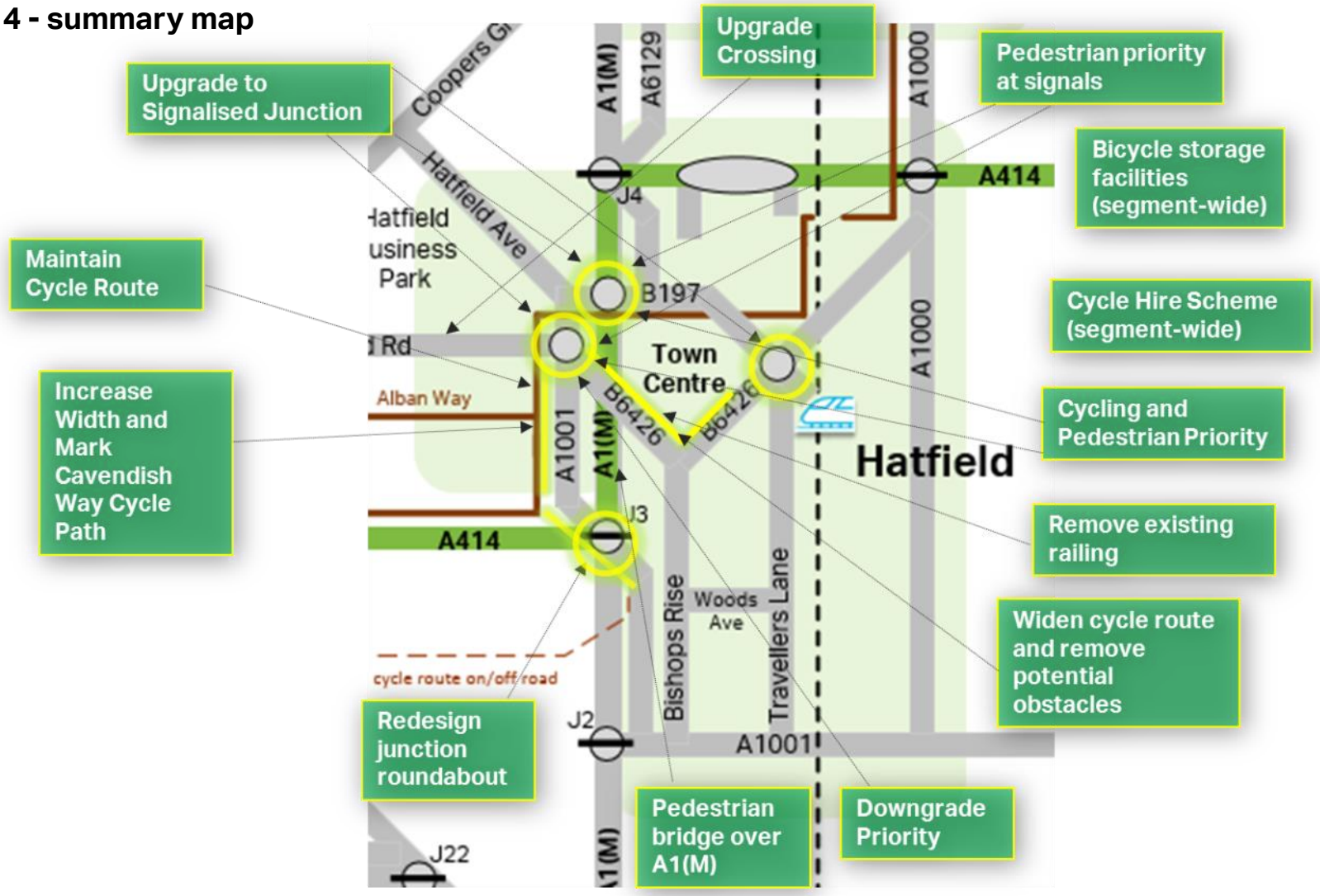
Segment 8: Hatfield

A414 Package 14 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Remove rail along edge of carriageway	Remove existing railing along the edge of the carriageway.	£500k - £1m
Widen existing cycle route and remove potential obstacles	Declutter the existing pavements and explore opportunities to provide a better streetscape for pedestrians and cyclists. Reduce the potential for conflict by formalising segregation between cyclists and pedestrians.	£50k - £500k
Downgrade access and priority	Reduce the priority that the Hotel access has onto the roundabout; provide a raised entry treatment across the access.	£500k - £1m
Re-phase signals to prioritise walking and cycling	Re-programme the signal phasing at these crossing locations to prioritise pedestrian movements.	£50k - £500k
Upgrade crossing type on St Albans Road	Remove the existing Zebra crossings and provide dual purpose crossings	£500k - £1m
Better maintaining of Comet Way cycle route	Better maintaining of the cycle route; Cut back vegetation, implement lighting on the cycle path and ensure a regular maintenance programme is in place.	£50k - £500k
Better maintaining and marking of Cavendish Way cycle path	Increase the width of the pavement to allow for formal marking of a cycle path.	£1m - £2.5m
Cycling and walking bridge over the A1(M)	Construct a bridge across the A1(M) providing a more direct as the crow files route for pedestrians and cyclist only. (with Highways England involvement)	£5m - £10m
Redesign junction to improve performance	A major redesign of the existing A1(M) junction 3 roundabout. (with Highways England involvement)	£2.5m - £5m
Cycle hire scheme in the university campuses	Implementation of a cycle hire scheme, with locations at each University campus. This could be tied into a large cycle hire scheme across the town or operate as an independent scheme.	£500k - £1m
Prominent bicycle storage facilities along both university campuses	Provide cycle parking and storage facilities in prominent locations	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 14	TOTAL INDICATIVE COST RANGE	£14m - £31m

Package 14 - summary map



Segment 8: Hatfield

Packages Overview

Package 15 – Hatfield - Cavendish Way/Queensway Corridor

(broadly consistent with Corridor 2 in the Hatfield Transport Strategy)

The overarching aim of Package 15 is:

> **To reprioritise the main transport corridor through Hatfield town centre to reduce the dominance of motorised vehicles, improve connectivity to the surrounding area and make a more attractive entrance to the town centre.**

The Package consists of:

- Implementation of bus priority measures, including a bus lane along Cavendish Way.
- Improvement of the cycle lanes along the corridor.
- Junction improvements, including signalisation, to improve conditions for active transport modes.
- New and upgraded road crossings.

The table below / overleaf summarises the interventions in this package.

A414 Package 15 – Hatfield-Cavendish Way/Queensway Corridor		
Name	**Short Description**	**Estimated Cost Range**
Traffic calming measures along Link Drive	Introduce traffic management measures along Link Drive	£500k - £1m
Cavendish Way-Queensway cycle facilities	Remove the existing railing and review the design and interchange for cyclists	£1m - £2.5m
Cavendish Way crossing upgrade, adjacent to Comet Way	Provide a dual purpose crossing for use by pedestrians and cyclists to increase the level of permeability for pedestrians and cyclists and provide a safer crossing arrangement	£500k - £1m
Implementation of bus lane (Cavendish Way)	Introduce a bus lane in the north eastern direction of the road	£2.5m - £5m

continued overleaf

A414 Package 15 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Improve marking of cycle lanes (Cavendish Way)	Improve the marking of the cycle lanes and ensure consistency along the route	£1m - £2.5m
Provide pedestrian crossing (Cavendish Way, adjacent to Meadow Dell)	A Zebra crossing or other formalised pedestrian crossing provision on Cavendish Way	£500k - £1m
Cavendish Way-Bishops Rise junction reconfiguration	Remove the existing roundabout and provide at-grade signalised junction. Redesigning the junction would improve the management of traffic flow through this congested junction	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 15	**TOTAL INDICATIVE COST RANGE**	**£7m - £16m**

Segment 8: Hatfield

Package 15 - summary map

Segment 8: Hatfield

Packages Overview

Package 16 – Hatfield - French Horn Lane Corridor

(broadly consistent with Corridor 5 in the Hatfield Transport Strategy)

The overarching aim of Package 16 is:

> **To increase active transport provision between Hatfield town centre and the train station by improving facilities for pedestrians and cyclists.**

The Package consists of:

- Development of cycling infrastructure along French Horn Lane, including cycle routes along French Horn Lane with a link to Queensway, junction upgrades, and new crossings.
- Implementation of public realm and safety improvements along the corridor, including wayfinding, street lighting and CCTV along streets and underpasses/bridges.
- Improvement of the pedestrian railway bridge.

The table below / overleaf summarises the interventions in this package.

A414 Package 16 - Hatfield-French Horn Lane Corridor		
Name	**Short Description**	**Estimated Cost Range**
Improve the walking environment: Improve lighting and install CCTV	Improve the street lighting and provide CCTV cameras along key walking routes between the railway station and town centre	£500k - £1m
Pedestrian crossings (Beaconsfield Road	Provide new formalised pedestrian crossing	£1m - £2.5m
Widen footpaths and cut back vegetation	Widen the footpaths by cutting back vegetation where possible on route to the station	£50k - £500k

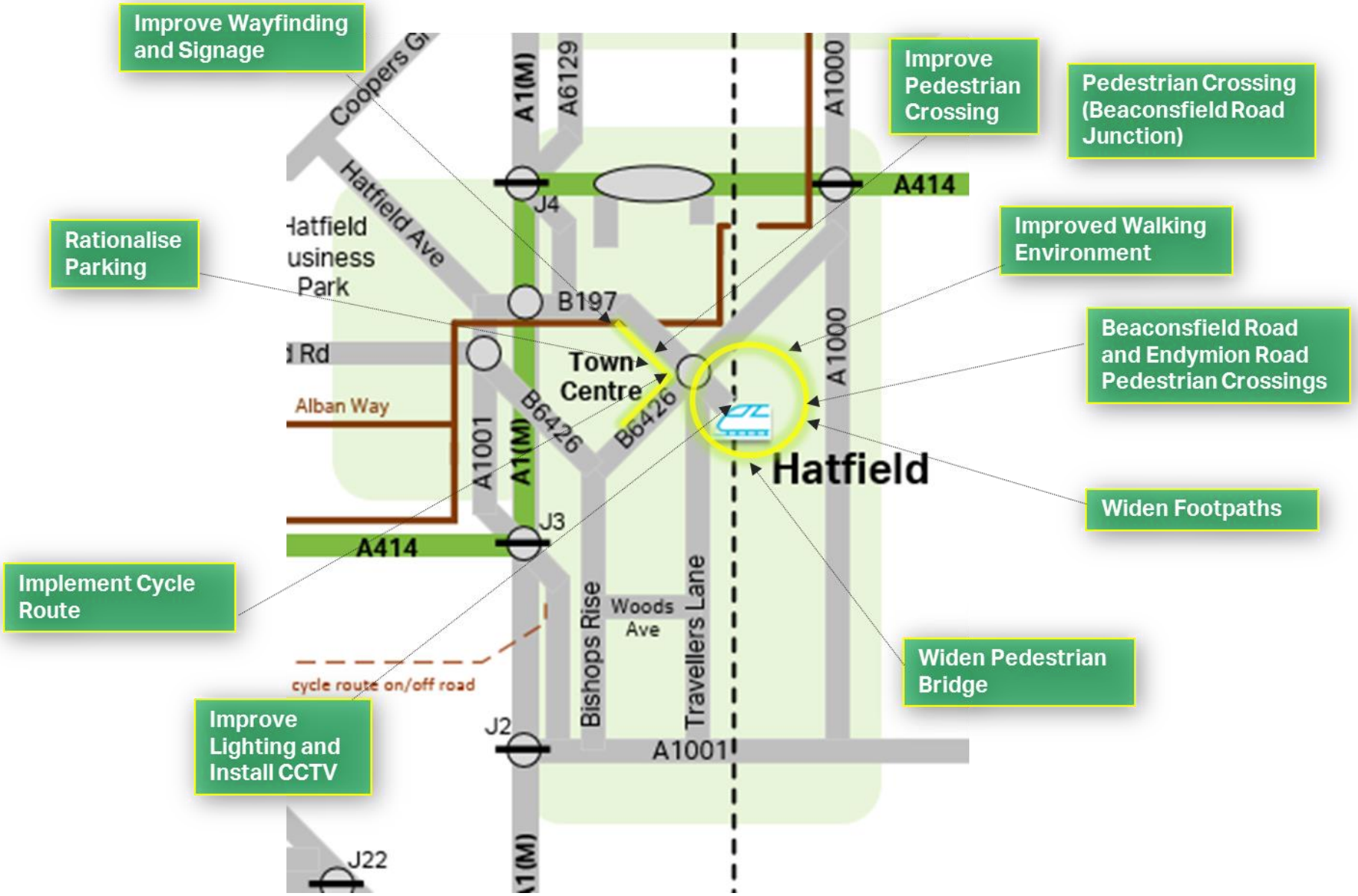
continued overleaf

A414 Package 16 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Widen bridge over railway and make it step free	Widen the pedestrian bridge across the railway and provide ramps on either side (with Network Rail involvement)	£2.5m - £5m
Implementation of cycle route between French Horn Lane and Queensway	Introduce cycle route along the side arm of French Horn Lane	£1m - £2.5m
Improvement of pedestrian crossing on French Horn Lane	Upgrade and widen existing pedestrian crossing	£500k - £1m
Improved wayfinding and signage of pedestrian and cycling routes (French Horn Lane)	Continue the Improvements to wayfinding and signage and guidance about routes	£50k - £500k
Review parking	Review the existing parking along French Horn Lane	£50k - £500k
Pedestrian crossing	Provide new signalised pedestrian crossing - Beaconsfield Road Junction	£1m - £2.5m
Improve lighting and install CCTV under the subway	Improve the lighting and install CCTV under the subway	£50k - £500k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 16	**TOTAL INDICATIVE COST RANGE**	**£7m - £17m**

Package 16 - summary map



Segment 8: Hatfield

Packages Overview

Package 17 – Hatfield - Wellfield Road Corridor

(consistent with Corridor 6 in the Hatfield Transport Strategy)

The overarching aim of Package 17 is:

> **To implement sustainable transport improvements along the Wellfield Road corridor, providing greater mode choice for trips between the Hatfield Business Park and the town centre.**

The Package consists of:

- Implementation of improvements at Comet Way, including downgrading Comet Way to one lane, improved crossings, roundabout signalisation, and provision of an off road cycle route around the roundabout.
- Implementation of bus priority measures, including a bus lane along Wellfield Road.
- Safety improvements at the A1(M) pedestrian bridge.

The table below / overleaf summarises the interventions in this package.

A414 Package 17 - Hatfield-Wellfield Road Corridor		
Name	**Short Description**	**Estimated Cost Range**
Improve walking environment: lighting and signage	Improve the lighting and signing of the pedestrian crossing	£50k - £500k
Fully signalise the Airfield Roundabout to improve performance	Upgrade the junction to be fully signal controlled, incorporating crossings for pedestrians and cyclists	£500k - £1m
Downgrade Comet Way to 1 lane	Downgrade Comet Way to one lane in either direction, (with Highways England involvement)	£1m - £2.5m
Off road cycle route around the Comet	Implementation of a cycle route to connect existing provisions on either side of the roundabout	£500k - £1m

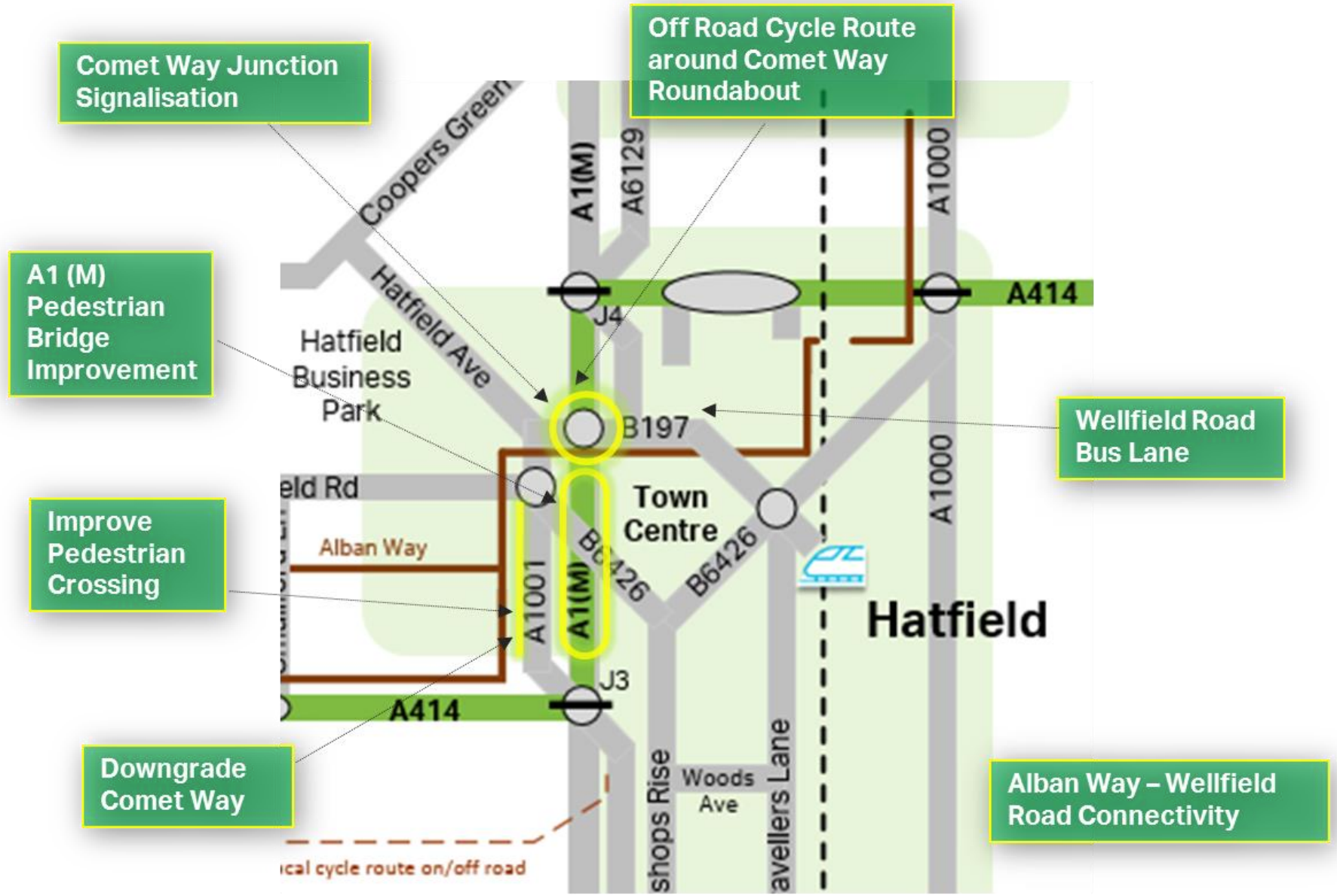
continued overleaf

A414 Package 17 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Implementation of Wellfield Road bus lane	The implementation of a North West bound bus lane	£1m - £2.5m
Improve connections between The Alban	Redesign the existing connections from Wellfield Road to the Alban Way cycle route	£1m - £2.5m
Improve pedestrian and cycling crossing	Improve pedestrian and cycling crossing of Comet way	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 17	**TOTAL INDICATIVE COST RANGE**	**£5m - £13m**

Package 17 - summary map



Segment 8: Hatfield

Packages Overview

Package 18 – Hatfield - St Albans Road East/Hertford Road Corridor

(broadly consistent with Package 6 in the Hatfield Transport Strategy)

The overarching aim of Package 18 is:

To reduce severance in north east Hatfield and enhance connectivity between The Ryde residential area, the town centre and railway station.

The Package consists of:

- Development of cycling infrastructure along the corridor, including cycle lanes along Mount Pleasant Lane, an off road cycle route along St Albans Road East, junction upgrades, signage improvements, lighting, and new crossings.
- Widened St Albans Road East rail bridge.

The table below / overleaf summarises the interventions in this package.

A414 Package 18 - Hatfield - St Albans Road East/Hertford Road Corridor		
Name	**Short Description**	**Estimated Cost Range**
Improved crossings at A1000-A414 Mount Pleasant Lane junction	Provide priority crossing for cyclists	£500k - £1m
Lighting of the cycle route	Improve lighting along the cycling route	£50k - £500k
Review signal timings (A1000/Great North	Review signal timings at the junction of A1000 and Great North Road	£1m - £2.5m
Implementation of cycle route and raised	Introduce a cycle route along St Albans Road East	£1m - £2.5m

continued overleaf

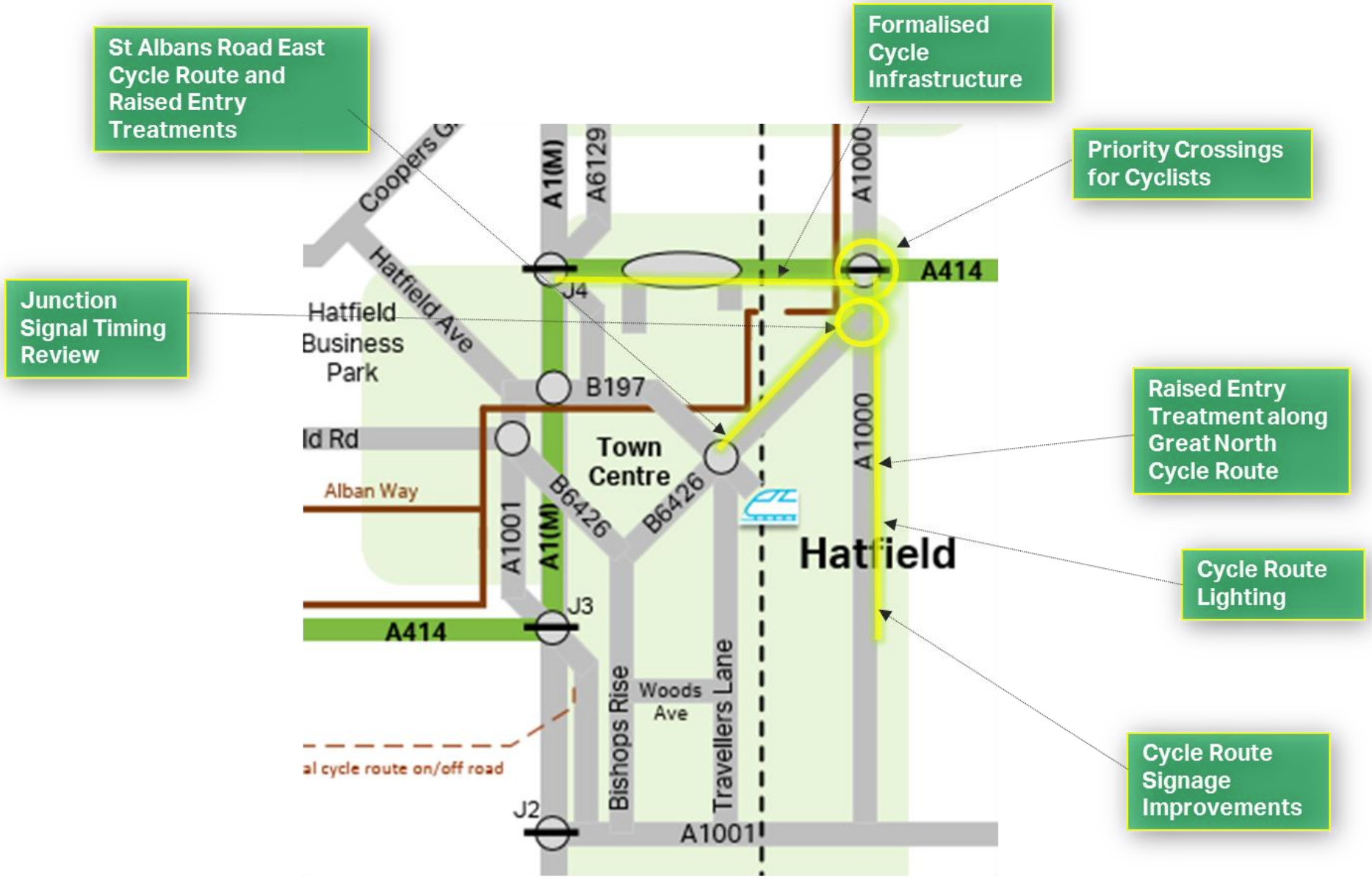
A414 Package 18 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Signing of cycle routes	Improve the existing signage to provide cycle route guidance	£50k - £500k
Provide formalised cycle infrastructure (Mount Pleasant Lane cycle route/	Provide footpath and cycle infrastructure	£1m - £2.5m
Raised entry treatment	Provide raised entry treatments along the route of the Great North Road cycle route	£500k - £1m

The proposed interventions are likely to come forward in conjunction with development, which is tied to near-by mineral extraction sites.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 18	**TOTAL INDICATIVE COST RANGE**	**£4m - £11m**

Package 18 - summary map



Segment 8: Hatfield

Packages Overview

Package 19 – St Albans-Welwyn Garden City Connectivity

The overarching aim of Package 19 is:

To form a sustainable transport corridor between St Albans and Welwyn Garden City, facilitating attractive and convenient journeys on foot and by bike between the towns with links to the Symondshyde and North West Hatfield developments, as well as Hatfield Business Park.

The Package consists of:

- Development of cycling and walking infrastructure along Coopers Green Lane, integrated with development along the corridor, including Symondshyde Village and North West Hatfield development.
- A reduced speed limit along Coopers Green Lane to support active transport infrastructure and reflect the more urbanised environment along the route, particularly alongside the North West Hatfield development.

The table below/overleaf summarises the interventions in this package.

A414 Package 19 - St Albans-Welwyn Garden City Connectivity		
Name	**Short Description**	**Estimated Cost Range**
Stanborough Roundabout	1 Segregated left turns added for A6129NB and SB approaches. 2 Enlargement of Coopers Green Lane/ Gt Nth Rd roundabout 3.Extend lane split on Coopers Green Lane and 2 lane approach for Brocket Rd	£1m - £2.5m
Coopers Green Lane Active Travel Infra-structure north east of Hatfield Avenue (towards Welwyn Garden City)	Off-road cycling and footway infrastructure along Coopers Green Lane	£2.5m - £5m

continued overleaf

A414 Package 19 (continued)		
Name	**Short Description**	**Estimated Cost Range**
Coopers Green Lane Active Travel Infrastructure south west of Hatfield Avenue (towards St Albans)	Cycling and footway infrastructure along Coopers Green Lane	£2.5m - £5m
Coopers Green Lane Speed Limit Reduction	Reduced speed limit along Coopers Green Lane to support active transport infrastructure and reflect more urbanised environment along route due to Symondshyde development	£50k - £500k
B653/Lemsford Village/Green Lanes junctions improvement	Junction improvements to reduce congestion and improve capacity and reliability	£1m - £2.5m
A6129/B197 Roundabout Signalisation	Junction improvement (potentially signalisation) to improve flow for right turning traffic from Luton to Hatfield, which is currently blocked by northbound Hatfield-Welwyn Garden City traffic	£1m - £2.5m

The proposed interventions in this package could be strongly linked to planned developments in the area, which in itself is tied to nearby mineral extraction sites. Coopers Green Lane connects St Albans to Welwyn Garden City and also provides an alternative route into Hatfield. Several planned developments are scheduled to come forward along this route - North West Hatfield and Symondshyde - both of which generate additional travel demand.

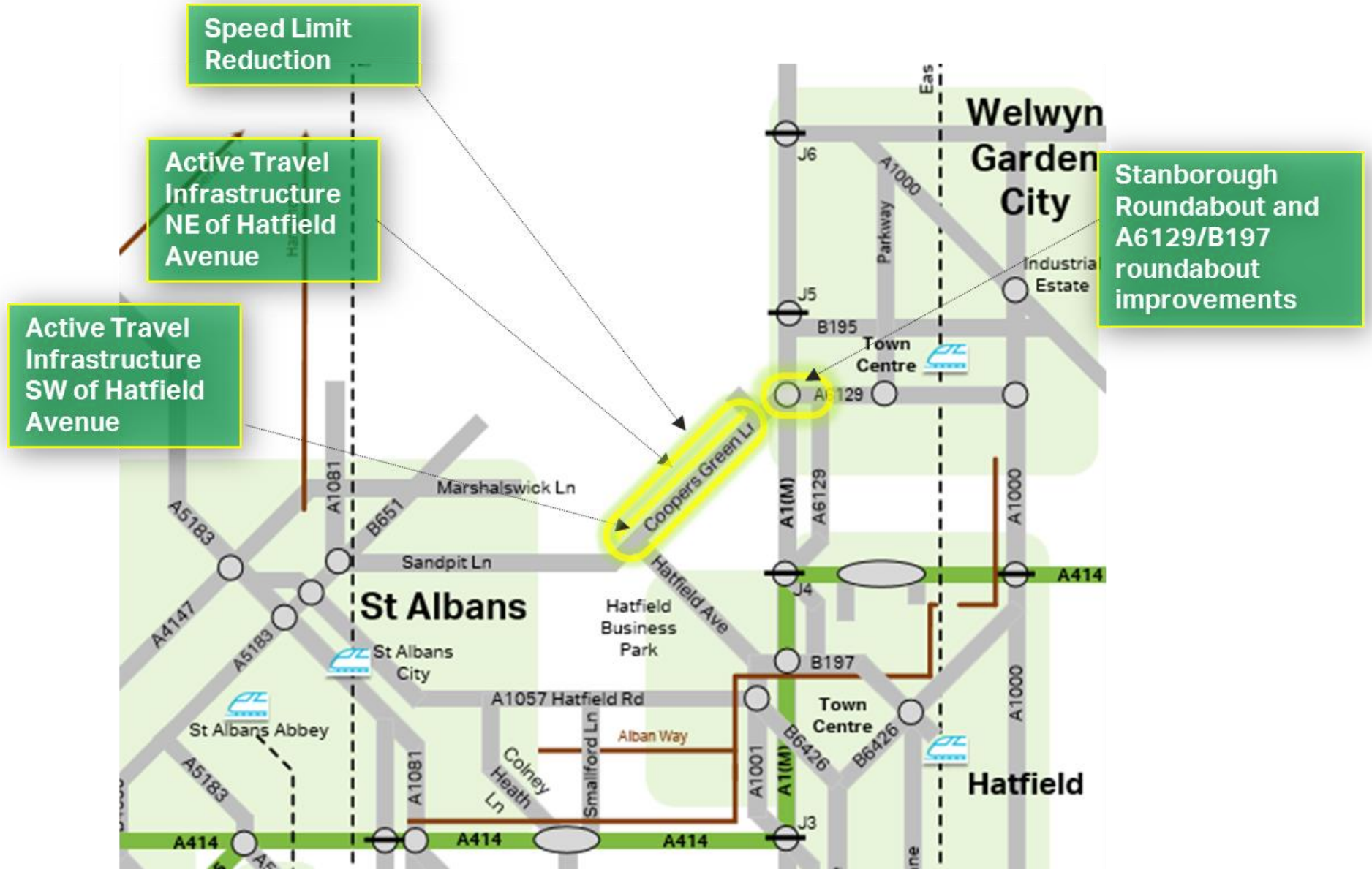
It will be critical for as many of the developments' new trips to take place by sustainable modes of travel, and a change to Coopers Green Lane will be important to facilitating more sustainable travel behaviour.

The proposed interventions are likely to come forward in conjunction with development, which is tied to nearby mineral extraction sites.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 19	TOTAL INDICATIVE COST RANGE	£8m - £18m

Package 19 - summary map



Segment 8: Hatfield

Packages Overview

Package 20 – A1(M) Junction 4 (North of Hatfield)

The overarching aim of Package 20 is:

To reduce congestion and increase reliability for inter-urban trips at A1(M) Junction 4 and adjoining links and junctions on the A414.

The Package consists of:

- A1(M) Junction 4 upgrades.
- A414 junctions upgrades at A1001/Oldings Corner and A1000/Mill Green.

The table below summarises the interventions in this package.

A414 Package 20 - A1(M) Junction 4		
Name	**Short Description**	**Estimated Cost Range**
Stanborough Roundabout	1 Segregated left turns added for A6129NB and SB approaches. 2 Enlargement of Coopers Green Lane/ Gt Nth Rd roundabout 3.Extend lane split on Coopers Green Lane and 2 lane approach for Brocket Rd	£1m - £2.5m
A414/Great North Road Junction Improvements	Westbound Arm Sign and Line Marking Improvements	£500k - £1m
A1(M) NB at Junction 4 to A414 Improvements	Review permitted lane movements to optimise the use of roadspace at the junction including eastbound lanes on the overbridge and southbound offslip. No physical alteration to the roundabout layout.	£50k - £500k
A414 Oldings Corner Junction Improvements	Modified approaches on A414 junction at Oldings Corner	£1m - £2.5m
A6129/B197 Roundabout Signalisation	Junction improvement (signalisation?) to improve flow for right turning traffic from Luton to Hatfield, which is currently blocked by northbound Hatfield-Welwyn Garden City traffic	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 20	TOTAL INDICATIVE COST RANGE	£4m - £9m

Package 20 - summary map

Segment 8 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

The Hatfield 2030+ vision and supporting Transport Strategy aim to deliver vital improvements to the town. Key intervention packages from the Transport Strategy are reflected in this Corridor Strategy, in particular those which aim to encourage modal shift for journeys occurring to/from the town centre, business park, university campuses and railway station.

A Mass Rapid Transit could also play a crucial role in facilitating more sustainable journeys within Hatfield and to other urban areas including St Albans, Welwyn Garden City and Hertford.

Hatfield is predicted to expand, with new developments planned to the north-west of the town including the separate Symondshyde development. Providing high quality local linkages for pedestrians, cyclists and local buses between these developments and major attractors including the business park and railway station will be very important.

The form and alignment of a Mass Rapid Transit through Hatfield has not yet been confirmed. It is quite likely to serve the business park and University of Hertfordshire De Havilland campus. In order to provide an express service, the avoidance of major areas of congestion will be important. It will also not be possible for a MRT to serve all parts of Hatfield or the planned new developments.

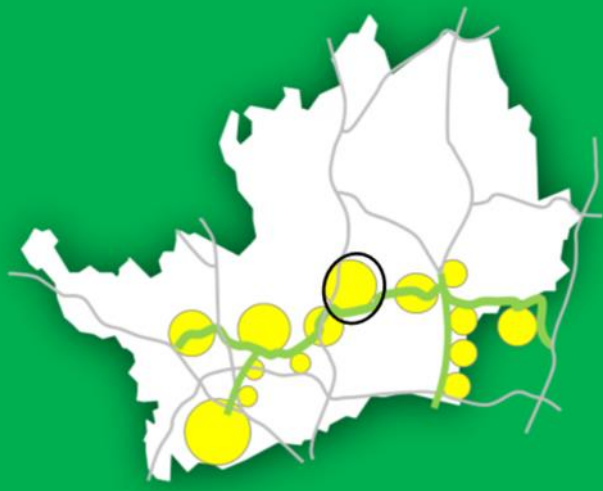
Extensions or branches of the main MRT route will create operational difficulties and time delays. As is the case along all parts of the MRT corridor, the provision of high quality local feeder routes for pedestrians, cyclists and local bus services to the nearest MRT interchange point (which will not be as closely spaced as those of a conventional local bus service) will be needed to enable the wider population to benefit from a MRT.

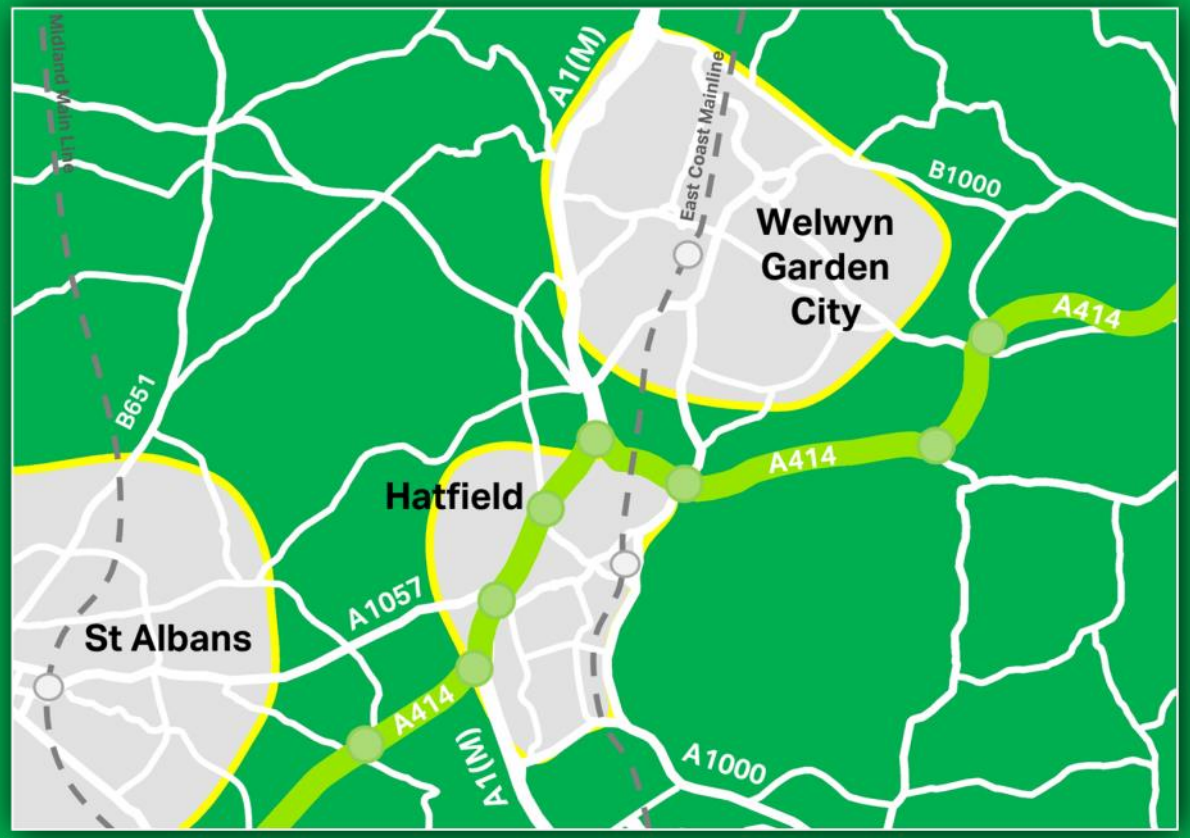
The positioning of interchanges will also be critical. To serve planned new developments on the edge of Hatfield, an interchange could be needed somewhere in the vicinity of Hatfield Avenue, Manor Road or the A1001 Comet Way (north of the Birchwood Avenue junction) with good feeder connections into Hatfield Business Park and onto Green Lanes.

A414 Corridor Segment

9

Welwyn Garden City-Hatfield





Segment 9: Welwyn Garden City

Welwyn Garden City and Hatfield both occupy the central part of the A414 corridor and are closely tied in terms of a range of transport links including the East Coast Main Line, A1(M), A1000, A6129 and bus services including the 301, 635 and 724 which provide north-south linkages between the two towns, and the A414 which feeds into the A1(M) in southern Hatfield and across the northern edge of Hatfield, around 1km south of Welwyn Garden City.

Both settlements are planned towns of a different heritage. Whilst Hatfield is a post-war 20th Century New Town, Welwyn Garden City adopts the principles of Ebenezer Howard in mixing town and country in the layout of streets. The attractive town centre lies broadly central within the town, although later suburban expansions to Welwyn Garden City including around the Panshanger area has seen the town expand eastwards. Planned housing-led development on the south-eastern edge of the town will generate new movements, and the A414 to the south will undoubtedly become an attractive transport corridor for future residents and employees travelling to/from neighbouring towns.

Like most towns in the corridor, whilst north-south transport linkages are quite strong, east-west links through Welwyn Garden City are fairly limited and predominately car based. As well as providing a 'back-end' route into Hatfield business park, Coopers Green Lane also facilitates movements mainly by car between St Albans and Welwyn Garden City. The B1000 is a local highway link eastwards towards Hertford, and is also served by local bus services including the 724. Notably, the Cole Green Way which forms part of the National Cycle Network, utilises a former rural railway alignment to facilitate cycle and walking trips between Welwyn Garden City and Hertford.

Welwyn Garden City is also home to the large Mundells employment area. This attracts commuting journeys not just from the town itself but from a wider area.

Segment 9 Summary (see Evidence Report for more detail)

Trip Distribution	Long (>15km) 49%	Medium (5-15km) 35%	Short (0-5km) 16%

Key Infrastructure and Services

Highway

- A1(M) runs through Hatfield and to the west of WGC, linking North Orbital Road (A414) at J3 to Hertford Road (A414) at J4.
- Hatfield and WGC are also linked through the A1000 Chequers and A6129 Stanborough Rd.
- More local trips than in other segments, largely between Hatfield and WGC.

Public Transport

- WGC railway station and Hatfield railway station are located on the East Coast Main Line and provide north-south connectivity
- Both stations have regular services that reach London terminals in under 25 minutes. Also good connections to the North.

Walking/Cycling

- WGC and Hatfield are connected by two off road cycle paths (adjacent to the A1000 and A6129) including Cole Green Way.
- Both towns have internal cycle paths of mixed quality.

Segment Challenges

Highway Issues

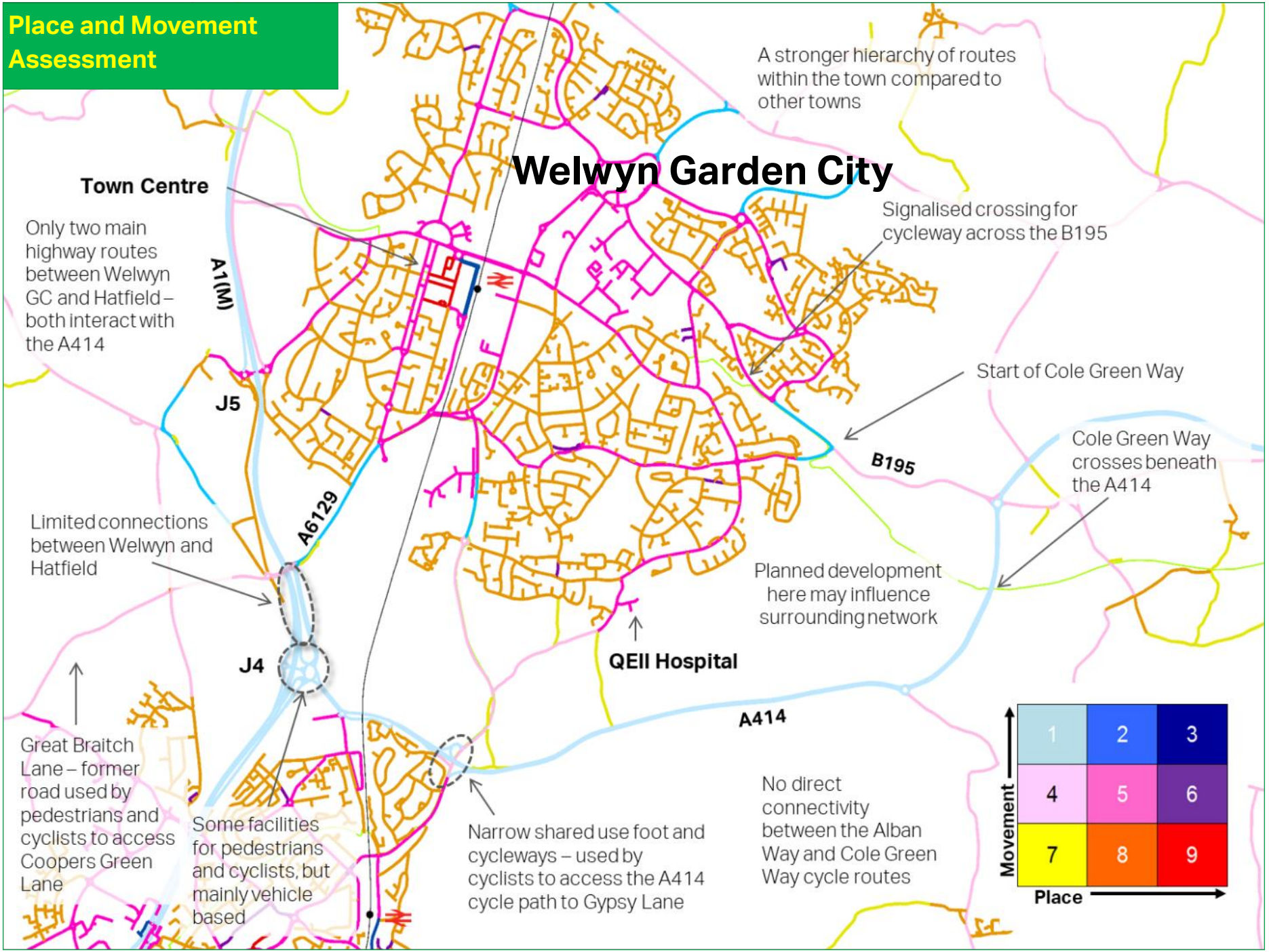
- Local congestion hotspots in urban areas of WGC and Hatfield.
- Inter-urban movements between Hatfield and WGC rely primarily on the congested A6129 and A1000.
- Several HCC defined hazardous sites.

Public Transport Issues

- PT access constrained by distance between Hatfield railway station and the town centre.
- Accessibility to Hatfield from St Albans, Hertford and WGC City is good, although poorer from these towns' outer edges.
- Over an hour by PT to Hatfield from areas east of the A10.
- Aside from Hatfield and Hertford, there is poor access to WGC.

Walking/Cycling Issues

- 4.5% of commuting trips between WGC and Hatfield are by bike despite the presence of off-road cycle tracks between the towns.

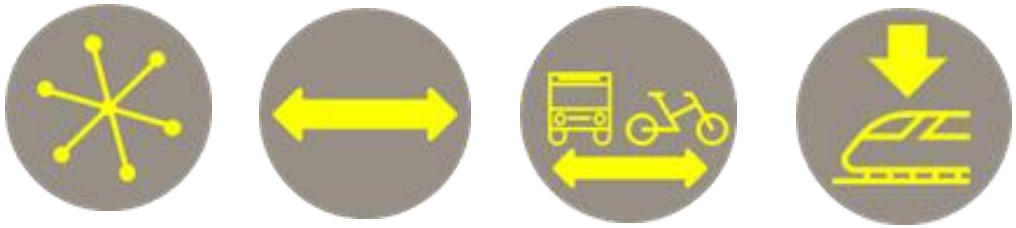

Place and Movement Assessment
Welwyn Garden City
A stronger hierarchy of routes within the town compared to other towns
Town Centre
Only two main highway routes between Welwyn GC and Hatfield – both interact with the A414
A1(M)
J5
Signalised crossing for cycleway across the B195
Start of Cole Green Way
B195
Cole Green Way crosses beneath the A414
A6129
Limited connections between Welwyn and Hatfield
Planned development here may influence surrounding network
QEII Hospital
J4
A414
Great Braitch Lane – former road used by pedestrians and cyclists to access Coopers Green Lane
Some facilities for pedestrians and cyclists, but mainly vehicle based
Narrow shared use foot and cycleways – used by cyclists to access the A414 cycle path to Gypsy Lane
No direct connectivity between the Alban Way and Cole Green Way cycle routes
Movement
Place
1
2
3
4
5
6
7
8
9

Segment 9: Welwyn Garden City-Hatfield

Segment 9 Priorities

A local interurban network for journeys by bus, train, bike and by car, prioritising better access to local services and jobs.

- A1(M) Junction 4 will continue to act as the key strategic gateway for longer distance trips, fed by the A1001and A6129 which also have an important local function.
- An improved A1(M) Junction 6-8 Smart Motorway (a committed improvement to be delivered by Highways England) will improve the efficiency and resilience of the strategic road and reduce knock-on congestion on adjoining local roads within Welwyn Garden City.
- A1000 will be a multi-modal local inter-urban road for providing onward access to Hatfield town centre, railway station, QE2 Hospital, local businesses including those on Broadwater Road and in the Mundells area, and residential areas.
- Mass Rapid Transit services to provide an express public transport link between Welwyn Garden City and Hatfield



Segment 9: Welwyn Garden City-Hatfield

Packages Overview

Package 20 – A1(M) Junction 4 (North of Hatfield)

The overarching aim of Package 20 is:

To reduce congestion and increase reliability for inter-urban trips at A1(M) Junction 4 and adjoining links and junctions on the A414.

The Package consists of:

- A1(M) Junction 4 upgrades.
- A414 junctions upgrades at A1001/Oldings Corner and A1000/Mill Green.

The table below summarises the interventions in this package.

A414 Package 20 - A1(M) Junction 4		
Name	**Short Description**	**Estimated Cost Range**
Stanborough Roundabout	1 Segregated left turns added for A6129NB and SB approaches. 2 Enlargement of Coopers Green Lane/ Gt Nth Rd roundabout 3.Extend lane split on Coopers Green Lane and 2 lane approach for Brocket Rd	£1m - £2.5m
A414/Great North Road Junction Improvements	Westbound Arm Sign and Line Marking Improvements	£500k - £1m
A1(M) NB at Junction 4 to A414 Improvements	Review permitted lane movements to optimise the use of roadspace at the junction including eastbound lanes on the overbridge and southbound offslip. No physical alteration to the roundabout layout	£50k - £500k
A414 Oldings Corner Junction Improvements	Modified approaches on A414 junction at Oldings Corner	£1m - £2.5m
A6129/B197 Roundabout Signalisation	Junction scheme to improve flow for right turning traffic from Luton to Hatfield, which is currently blocked by northbound Hatfield-Welwyn Garden City traffic	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 20	TOTAL INDICATIVE COST RANGE	£4m - £9m

Package 20 - summary map

Segment 9: Welwyn Garden City-Hatfield

Packages Overview

Package 21 – Hatfield-Welwyn Garden City Connectivity

The overarching aim of Package 21 is:

To strengthen local connections between Hatfield and Welwyn Garden City by active travel modes, encouraging modal shift from private car and improving recreational facilities within the Green Corridor running between the towns.

The Package consists of:

- Improvement and promotion of the A1000 corridor cycle track between Hatfield and Welwyn Garden City.
- Development of a southern Welwyn Garden City cycle bypass linking Hatfield directly to the Cole Green Way cycle track.
- Implementation of a recreational Welwyn Hatfield Green Corridor between the towns.

The table below / overleaf summarises the interventions in this package.

A414 Package 21 - Hatfield-Welwyn Garden City Connectivity		
Name	**Short Description**	**Estimated Cost Range**
A1000 Cycle Track Improvements	Physical improvements to cycle track including surface, crossings, general maintenance, etc.	£1m - £2.5m
Hatfield-Cole Green Way Cycle Route	Southern Welwyn Garden City cycle route from Hatfield to Cole Green Way	£10m - £50m
Cole Green Way Signage at B195	Wayfinding improvement to Cole Green Way at B195, currently unclear-directing cyclists to main road	£50k - £500k
Marketing and Promotion	Marketing and Promotion of cycle track improvements (Cole Green Way)	£50k - £500k

Continued overleaf

A414 Package 21 - Hatfield-Welwyn Garden City Connectivity (continued)		
Name	**Short Description**	**Estimated Cost Range**
Welwyn Hatfield Green Corridor	Implement Green Corridor between Hatfield and WGC as per the Welwyn Hatfield Borough Council draft Local Plan policy SP 12	£1m - £2.5m

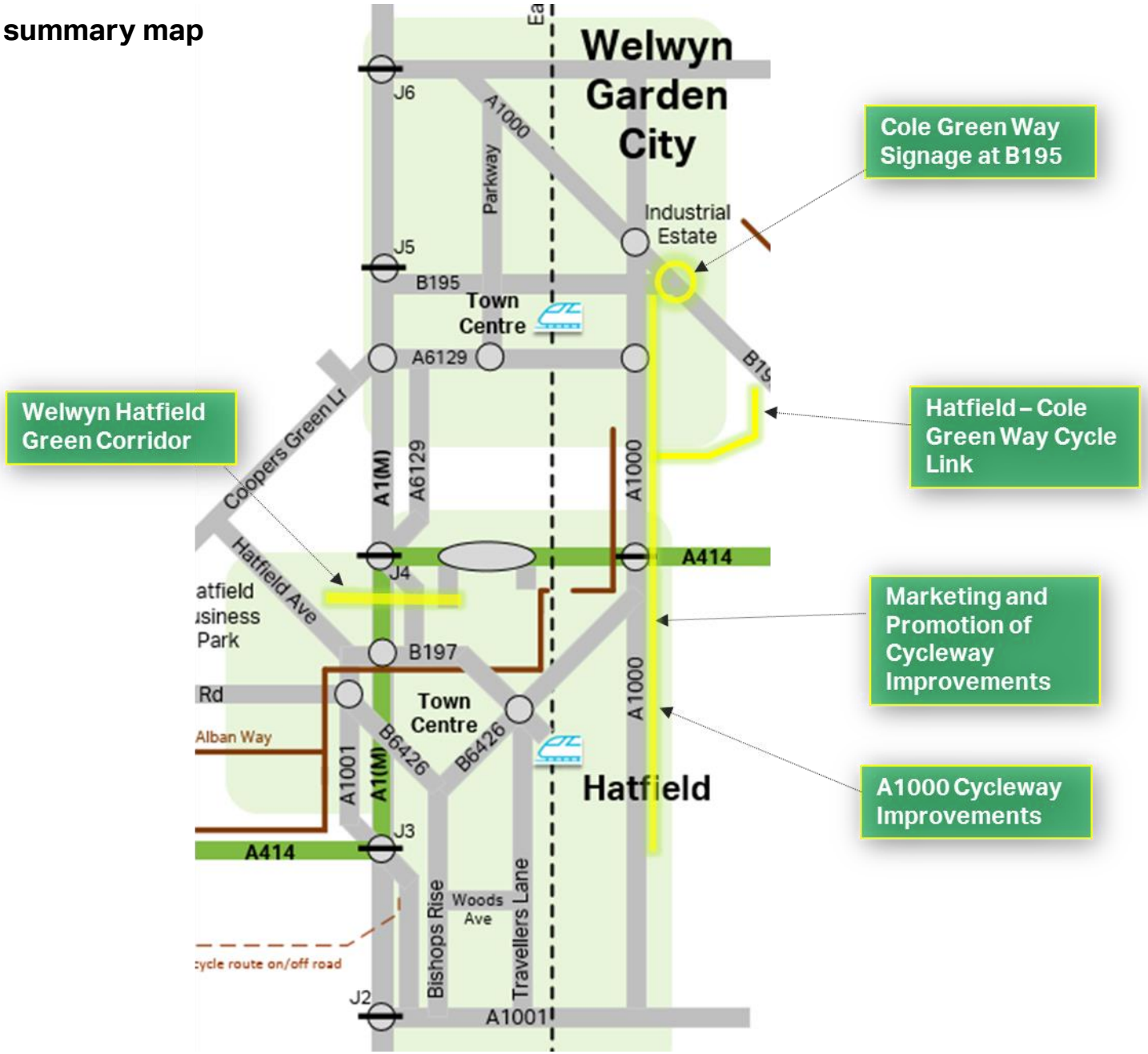
The proposed improvements to Cole Green Way have been developed with consideration of the Cole Green Way Greenspace Action Plan and the Rights of Way Improvement Plan.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 21	**TOTAL INDICATIVE COST RANGE ESTIMATE**	**£12m - £56m**

Segment 9: Welwyn Garden City-Hatfield

Package 21 - summary map



Segment 9: Welwyn Garden City-Hatfield

Packages Overview

Package 22 – Welwyn Garden City Bridge Road Transformation

The overarching aim of Package 22 is:

To transform Bridge Road into a sustainable spine that enhances connections on foot, by bike and by bus between the Welwyn Garden City town centre and the employment zone east of the rail line, and reduce the dominance of motorised traffic.

The Package consists of:

- Managed road space which can help facilitate the implementation of improved cycle routes, widened footways, and improved bus stops along Bridge Road.
- Improvements to the Bridge Road/Broadwater Road junction.

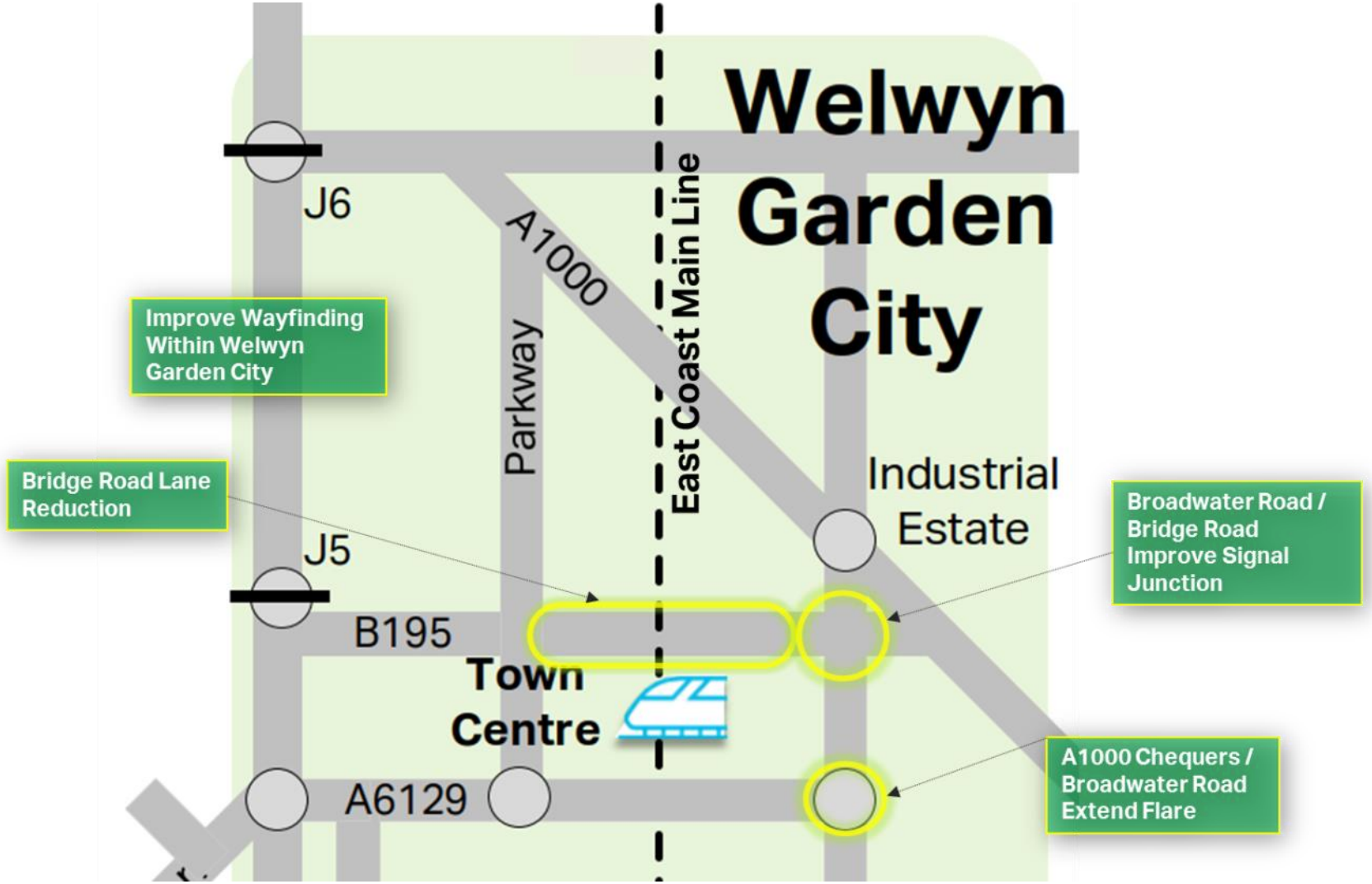
The table below summarises the interventions in this package.

A414 Package 22 - Bridge Road Transformation - Welwyn Garden City		
Name	**Short Description**	**Estimated Cost Range**
A1000 Chequers/ Broadwater Road	Extend flare of Broadwater Road southbound approach and on A1000 northbound approach	£1m - £2.5m
Wayfinding	Improved wayfinding within Welwyn Garden City	£50k - £500k
Bridge Road Lane Reduction	Reduce Bridge Road to one lane of traffic in each direction to provide enhanced cycle routes and footways as well as improved bus stops	£1m - £2.5m
Broadwater Road/Bridge Road	Improved signal junction	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 22	TOTAL INDICATIVE COST RANGE	£3m - £8m

Package 22 - summary map



Segment 9 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

Hatfield and Welwyn Garden City are closed spaced and linked by road, rail, bus and cycle routes. It is also feasible to make a journey on foot between the more peripheral parts of the two towns. The A414 forms a barrier between the two urban areas and this is likely to discourage journeys being made on foot and by bike in particular, although crossing facilities are available at A1(M) Junction 4 adjacent to the retail park.

The good range of travel options currently provided could be supplemented by a Mass Rapid Transit system although the primary aim would be for the MRT to facilitate journeys to other adjoining towns. Depending on the form and alignment of the MRT, Hatfield and Welwyn Garden City could form major interchange hubs so that passengers travelling over longer lengths of the A414 corridor may need to change MRT services in either of these two towns depending on the direction of travel and destination. The high frequency of MRT services and high quality interchange facilities will make the transfer between different MRT services fast and efficient.

The concept of a Green Corridor is being promoted locally by Welwyn Hatfield Borough Council and will facilitate pedestrian and cyclist movements between Hatfield and Welwyn Garden City. More importantly, it will link together the planned housing developments around the two towns from the planned Symondshyde and North West Hatfield developments in the west to the proposed Birchall Garden Suburb in the east. Importantly, the Green Corridor will provide an attractive corridor for pedestrians and cyclists connecting key routes between Hatfield and Welwyn Garden City including the A6129 (Stanborough) and the A1000 (Mill Green).

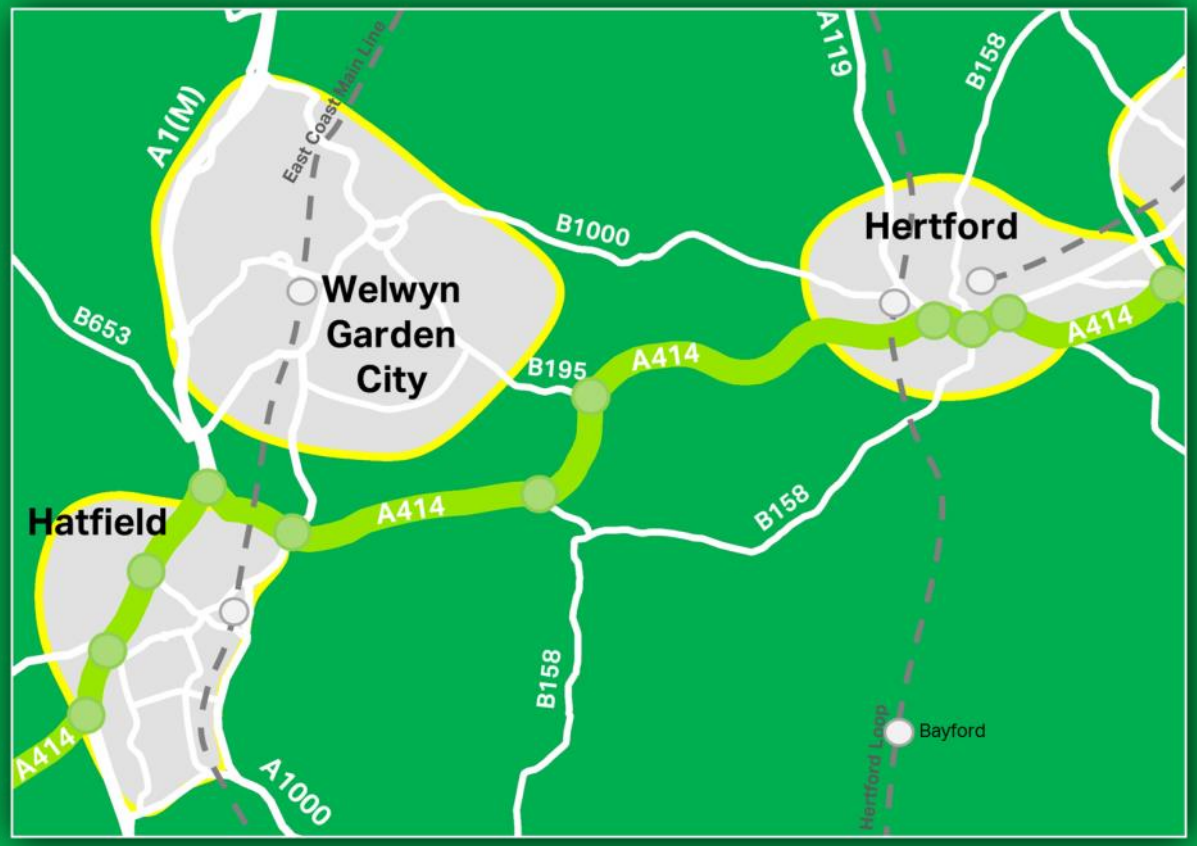
The Green Corridor will form an important component in facilitating sustainable inter-urban travel between the towns.

The Corridor Strategy has identified the need for improvements to A1(M) Junction 4. Any improvements will need to incorporate high quality walking and cycling facilities. Highway capacity improvements here will be needed to manage traffic delays and help reduce the occurrence of traffic rat-running through Hatfield (cutting the corner between the A414 and A1(M) to avoid Junction 4). The place and movement function of internal roads in Hatfield will therefore need to prioritise the needs of local journeys beginning and ending within the town, discourage through trips and encourage sustainable travel.

A414 Corridor Segment

10

Hatfield-Welwyn Garden City-Hertford



Segment 10: Hatfield-Welwyn Garden City-Hertford

Hatfield and Welwyn Garden City are major employment and retail destinations (Hatfield Business Park, university, Galleria, the town centres, Mundells employment area), drawing trips in from north, south, east and west.

Analysis has identified Hatfield/Welwyn Garden City –Hertford as a distinctive segment. This is served by the A414 dual carriageway running east-west across the northern edge of Hatfield and forming a bypass to Welwyn Garden City; the B1000 local route between the northern suburbs of Welwyn Garden City and Hertford; the Cole Green Way leisure route for cyclists and walkers (part of the National Cycle Network) and other feeder routes including the B195 Birchall Lane and B1455 Holwell Lane which together with the B158 Lower Hatfield Road, form an alternative albeit lower capacity country road alternative to the A414 towards Hertford.

Planned growth to the south-east of Welwyn Garden City could mark a change to how the A414 and local feeder routes such as the B195 Birchall Lane are used. There is currently a degree of separation between the A414 and Welwyn Garden City, however an expanded town could result in parts of the A414 being a convenient route to reach destinations elsewhere in the corridor, including those in immediate adjacent towns such as Hatfield and Hertford.

This segment is influenced by highway which is very susceptible to congestion. The series of junctions clustered around A1(M) Junction 4, adjacent to the retail park, regularly experiences congestion and is where north-south movements coincide with east-west movements. To the east, the A414 runs beneath the Hertford Loop railway line where it reduces to a single lane and on into Hertford which is another major congestion area.

Where opportunities to make trips by non-car modes are currently more limited, the planned future growth in the local area could be a catalyst for facilitating journeys by more sustainable modes of travel. It may not be feasible or desirable for simply cater for all traffic growth by making what could be very expensive and less sustainable improvements to the highway network alone.

Segment 10 Summary (see Evidence Report for more

Trip Distribution	Long (>15km) 75%	Medium (5-15km) 25%	Short (0-5km) 0%
Key Infrastructure and Services	**Highway** • The A414 runs east to west (speed limit 70mph). • Parallel routes in this segment include the 60mph B1000 and the 60mph B158. • A relatively large proportion of trips are strategic in nature.		
	Public Transport • The 341, 641 and 724 buses run along this segment, connecting Hertford to Welwyn Garden City / Hatfield.		
	Walking/Cycling • The Cole Green Way off-road cycle path runs in between Hertford and Welwyn Garden City.		
Segment Challenges	**Highway Issues** • Congestion hotspots in this segment include: A1(M) J4 and at the A1000/A414 junction. • Rat-running on routes parallel to the A414 (B158 and B1000) due to peak hour congestion on the A414 in Hertford. • Two junctions are HCC defined hazardous sites.		
	Public Transport Issues • There are several bus services that cover this segment; however, frequency is low in villages such as Birch Green, Letty Green and Bayfordbury.		
	Walking/Cycling Issues • The Cole Green Way Cycle path runs through this segment, however, rates of cycling between Hertford and Welwyn Garden City town centres are still low (1.7%). • There is a strategic gap in the cycle route network between Hertford and Hatfield. Any cycle trips between Hertford and Hatfield need to take a longer route through Welwyn Garden City.		

Segment 10: Hatfield-Welwyn Garden City-Hertford

Segment 10 Priorities

An interurban corridor promoting more resilient and time efficient journeys by car, bus and bike

- A1000 will be a multi-modal local inter-urban road for providing onward access to Hatfield town centre, railway station, QE2 Hospital, local businesses including those on Broadwater Road and in the Mundells area, and residential areas.
- Improved access to the railway stations for longer as well as shorter distance trips, e.g. Digswell to Hatfield, Welwyn Garden City to Welham Green (to encourage modal shift away from the car).
- Maintain the A414 to the dual carriageway standard in this area to ensure it can continue to serve as the main interurban route between Hatfield/Welwyn and Hertford, and dissuade the use of rat runs on inappropriate country roads.
- Promote east-west travel by public transport using a Mass Rapid Transit, with access provided at a new interchange on the south-eastern outskirts of Welwyn Garden City depending on the form and alignment of the MRT.
- Enhance cycling infrastructure within town centres and connect these to the Cole Green Way to enable more direct cycling between Hatfield and Hertford.
- Improve Birchall Lane and Holwell Lane junctions on the A414 to facilitate Mass Rapid Transit services.

Segment 10: Hatfield-Welwyn Garden City-Hertford

Packages Overview

Package 20 – A1(M) Junction 4 (North of Hatfield)

The overarching aim of Package 20 is:

> **To reduce congestion and increase reliability for inter-urban trips at A1(M) Junction 4 and adjoining links and junctions on the A414.**

The Package consists of:

- A1(M) Junction 4 upgrades.
- A414 junctions upgrades at A1001/Oldings Corner and A1000/Mill Green.

The table below summarises the interventions in this package.

A414 Package 20 - A1(M) Junction 4		
Name	**Short Description**	**Estimated Cost Range**
Stanborough Roundabout	1 Segregated left turns added for A6129NB and SB approaches. 2 Enlargement of Coopers Green Lane/ Gt Nth Rd roundabout 3.Extend lane split on Coopers Green Lane and 2 lane approach for Brocket Rd	£1m - £2.5m
A414/Great North Road Junction Improvements	Westbound Arm Sign and Line Marking Improvements	£500k - £1m
A1(M) NB at Junction 4 to A414 Improvements	Review permitted lane movements to optimise the use of roadspace at the junction including eastbound lanes on the overbridge and southbound offslip. No physical alteration to the roundabout layout	£50k - £500k
A414 Oldings Corner Junction Improvements	Modified approaches on A414 junction at Oldings Corner	£1m - £2.5m
A6129/B197 Roundabout Signalisation	Junction improvement (signalisation?) to improve flow for right turning traffic from Luton to Hatfield, which is currently blocked by northbound Hatfield-Welwyn Garden City traffic	£1m - £2.5m

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 20	TOTAL INDICATIVE COST RANGE	£4m - £9m

Package 20 - summary map

Segment 10 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

The primary link between Hatfield, Welwyn Garden City and Hertford is the A414 dual carriageway. Several more local routes run in parallel including the B1000 and B158 Lower Hatfield Road. The Cole Green Way facilitates inter-urban travel by bike between these urban areas. Planned development on the south-eastern edge of Welwyn Garden City will bring the town much closer to the A414. As sustainable urban extensions to the town, strong local links to the centre of Welwyn Garden City, its railway station and to the Green Corridor will be really important.

Given their edge of town location in close proximity to the A414, it will be important that the private car does not become the mode of choice for journeys outside of Welwyn Garden City from the planned urban extensions. A Mass Rapid Transit system therefore could play a crucial role in facilitating inter-urban travel by a more sustainable mode. Depending on the form and alignment of the MRT, a potential interchange facility serving planned development to the south east of Welwyn Garden City will therefore be required to facilitate more sustainable interurban journeys. A fast and frequent MRT service which is not susceptible to more general traffic delays within Welwyn Garden City town centre will be necessary in order to make journeys from the Birchall Garden Suburb towards Hatfield and beyond by MRT as or more attractive than by private car.

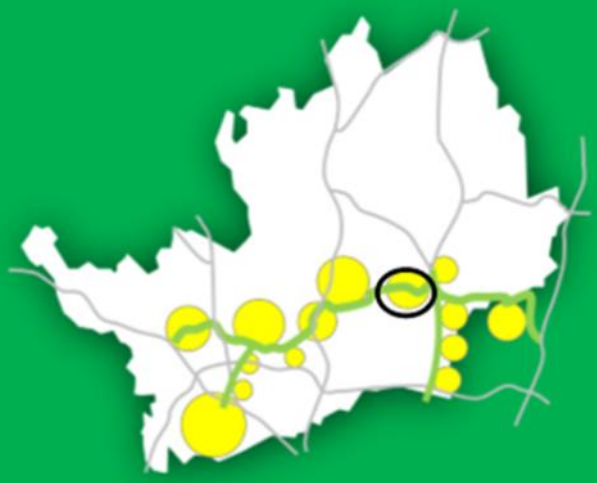
As discussed further under Segment 11, a strategic intervention around Hertford, for example a bypass, could be required to enable the MRT. If a strategic intervention was taken forward it could influence local routing patterns within Segment 10. This will need to be examined in more detail as part of more further studies to be undertaken subsequent to the Corridor Strategy.

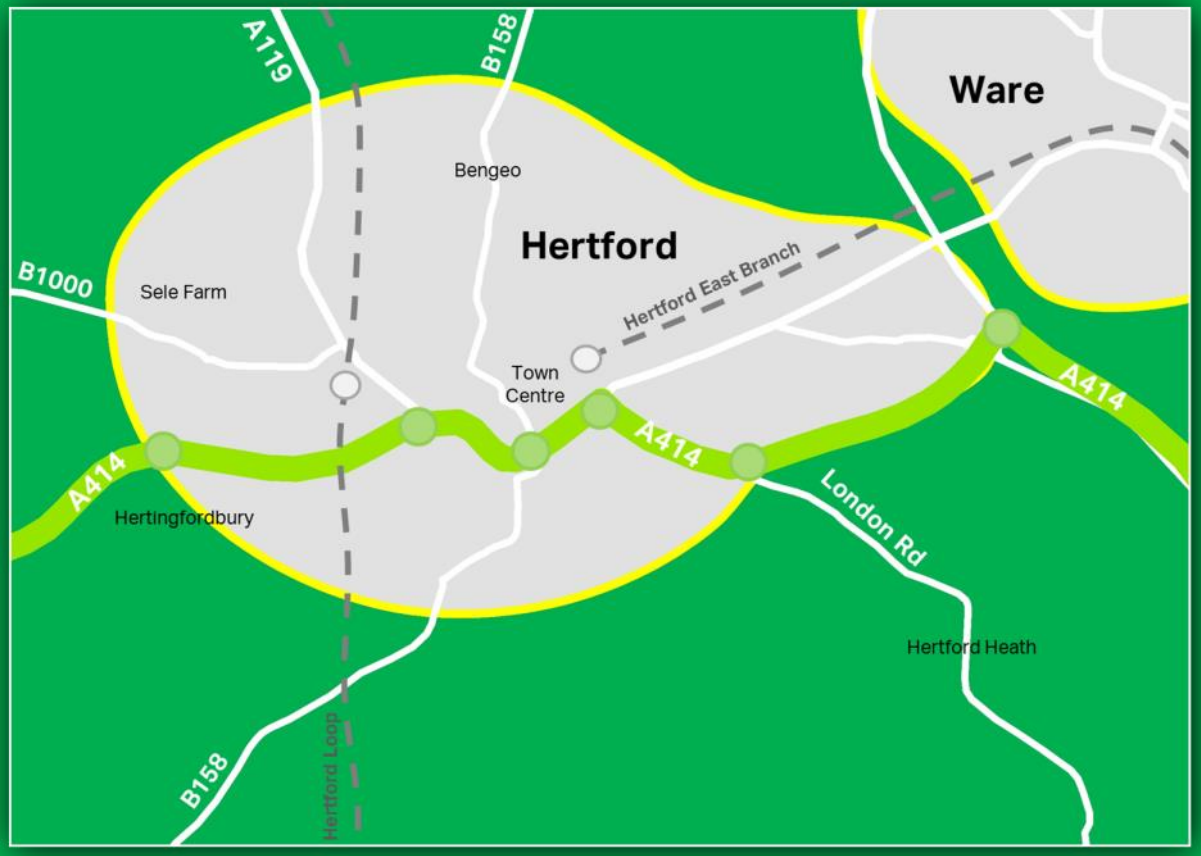
Highway routes such as the B195 could therefore play a dual role of facilitating local, sustainable access to the planned garden suburb developments as well as access by car from Welwyn Garden City to the A414. The allocation of road space to different users will therefore need to be considered carefully as part of emerging more detailed development proposals and development masterplanning.

A414 Corridor Segment

11

Hertford





Segment 11: Hertford

The county town of Hertford is situated between the A1(M) and A10 highway corridors and is dissected by the A414 which runs through the town. By road, Hertford is connected to Stevenage via the A119 (and onwards via the A602), to the nearby town of Ware (also via the A119) and the northern part of Welwyn Garden City (via the B1000). By rail, Hertford has the benefit of two railway stations. Hertford North station is located on the Hertford Loop branch of the East Coast Main Line, connecting London Moorgate station to the south with Stevenage to the north. Hertford North station is an approximately 10-15 minute walk from Hertford town centre. Hertford East station is a terminus on a branch line connected to the West Anglia Main Line. Rail services route only to/from the south including the Broxbourne towns, with Liverpool Street station being the London terminus. Travel by rail to Stansted and Cambridge is possible with a change at Broxbourne station. Hertford East is an approximately 5-10 minute walk from Hertford town centre.

The compact town centre hosts a range of well known high street and independent shops, with some of the roads running through the centre being traffic free.

The A414 has a significant impact on the town in terms of transport and connectivity. It skirts the southern edge of the town centre and is formed of a dual carriageway. Pedestrian and cyclist crossing facilities are fairly sparse, with a selection of underpasses and at-grade signal-controlled crossings.

The A414 experiences very severe traffic congestion during the weekday AM and PM peak periods. Traffic congestion stems from high volumes of traffic feeding through an urban network. Furthermore, where the A414 passes beneath the Hertford Loop railway, it is single carriageway. Many different traffic movements coincide at junctions including the Bluecoats roundabout which causes congestion. As a primary east-west route, the A414 serves through-trips whilst also serving the needs of local people accessing it for both shorter and longer distance trips, or who simply need to cross it to reach their destination within Hertford. With existing and forecast levels of congestion, the A414 acts as a constraint on delivering opportunities for much improved sustainable travel provision in Hertford, and facilitating planned housing growth.

Segment 11 Summary (see Evidence Report for more detail)

Trip	Long (>15km) 53%	Medium (5-15km) 22%	Short (0-5km) 25%

Key Infrastructure and Services

Highway

- A414 is mostly dual-carriageway with a 40mph speed limit.
- Key junctions include the A414/A119, A414/B158 roundabouts.

Public Transport

- Residential areas in Hertford are linked to the town centre and its rail stations by bus routes such as the 333, 395, 396 and H3.
- There are two railway stations, Hertford East and Hertford North.

Walking/Cycling

- The cycle route network within the town is relatively sparse. However, there are off-road routes connecting Hertford to Ware (Hertford to Ware towpath) and Welwyn Garden City (Cole Green Way).

Segment Challenges

Highway Issues

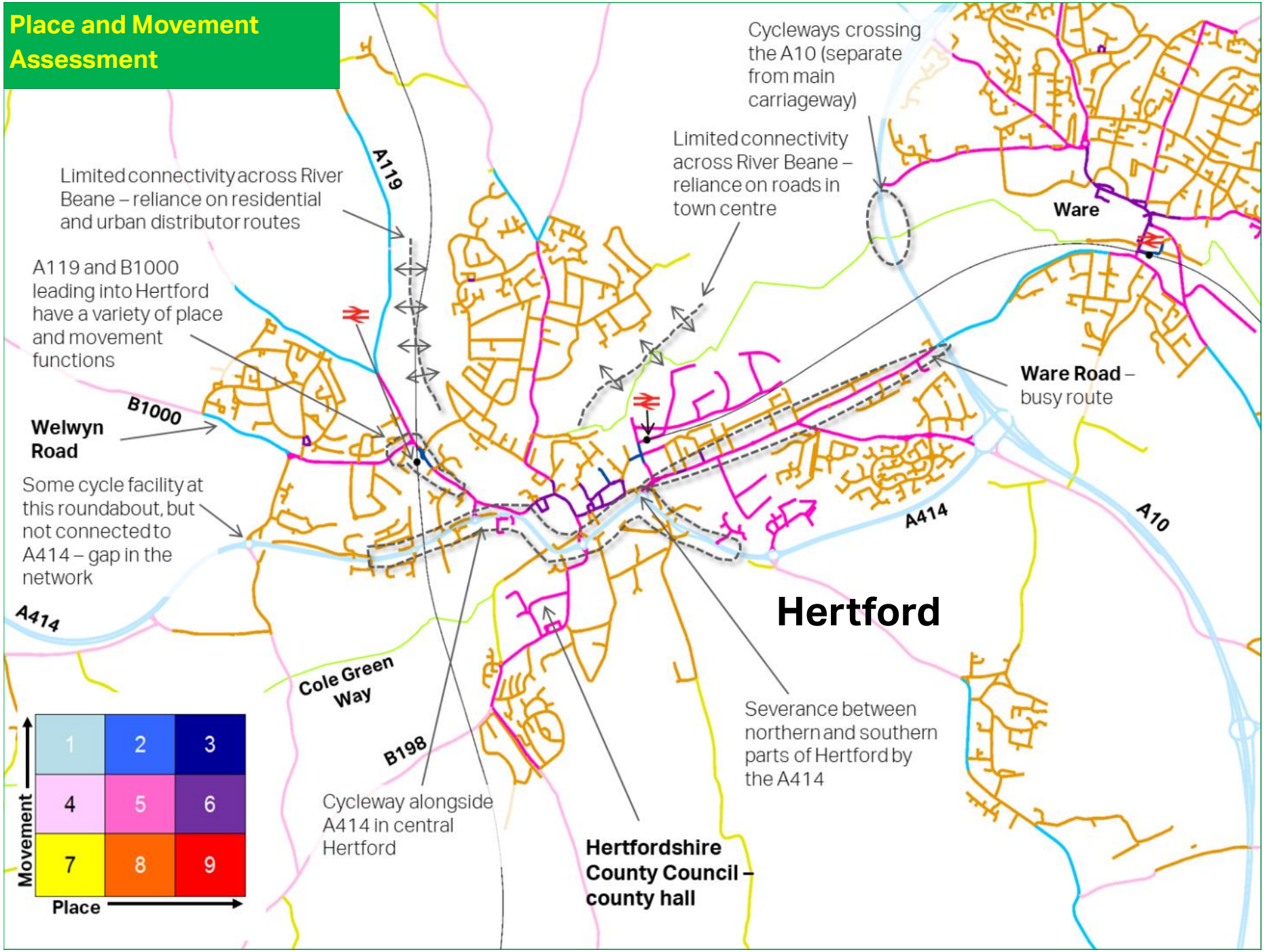
- Air Quality Management Area (AQMA) along the A414 in Hertford.
- Congestion through Hertford is high at several junctions, including the Bluecoats roundabout and B158 roundabout.
- There are a number of HCC defined hazardous sites.

Public Transport Issues

- Train stations are a mile apart making interchange difficult.
- Hertford North is located away from the main employment areas.
- PT services to neighbouring towns can have long journey times.
- There is limited accessibility to parts of Hatfield and WGC.
- Accessibility from A10 Corridor towns is good, but deteriorates with distance away from the West Anglia mainline stations.
- Most of Harlow is over 45 minutes away from Hertford

Walking/Cycling Issues

- Underpasses are often the only option when crossing the A414.
- The A414 acts as a barrier to cyclists travelling across the town.
- Poor air quality in Hertford may discourage active travel.
- Walking/cycling impractical due to medium/high flood risk.
- Cycle paths in the town centre are sparse and disconnected.


Place and Movement Assessment
Cycleways crossing the A10 (separate from main carriageway)
Limited connectivity across River Beane – reliance on roads in town centre
Limited connectivity across River Beane – reliance on residential and urban distributor routes
A119
Ware
A119 and B1000 leading into Hertford have a variety of place and movement functions
B1000
Welwyn Road
Ware Road – busy route
Some cycle facility at this roundabout, but not connected to A414 – gap in the network
A414
A10
Hertford
A414
Cole Green Way
B198
Severance between northern and southern parts of Hertford by the A414
Cycleway alongside A414 in central Hertford
Hertfordshire County Council – county hall
Movement
Place
1
2
3
4
5
6
7
8
9

Segment 11: Hertford

Segment 11 Priorities

An urban transport and travel network facilitating both local and interurban journeys via sustainable modes

- A transformative change in function of the current A414 through Hertford to turn it more into a 'street' with exemplar facilities for pedestrians, cyclists and passenger transport services including a Mass Rapid Transit.
- Increased accessibility between the two Hertford train stations, through an improved cycle route and bus services.
- An improved cycle network within Hertford, especially on north-south routes, with an extension of the Cole Green Way to Hertford North and Hertford-to-Ware tow path.
- The potential for a strategic intervention around Hertford, such as a bypass, to enable delivery of the sustainable travel improvements including the Mass Rapid Transit.

Hertford travel conditions

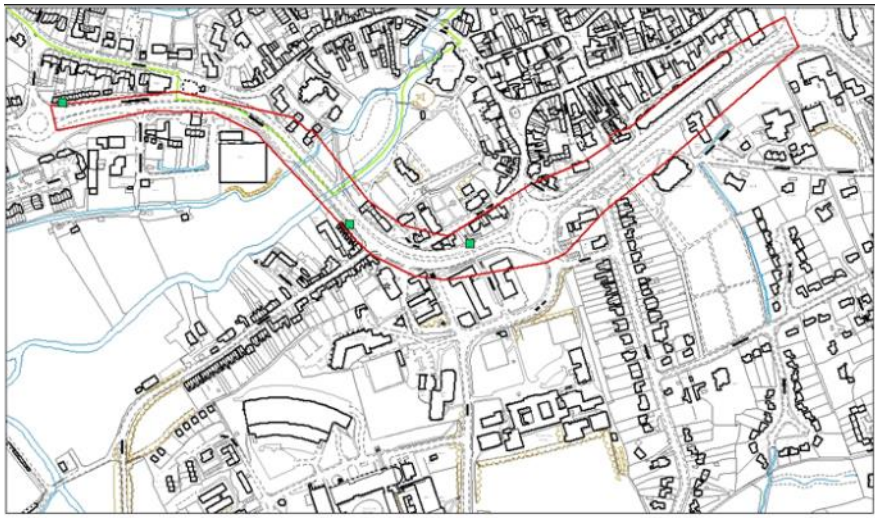
The MRT in Hertford

The MRT will be the priority piece of infrastructure for the A414 corridor. Some of the key proposals put forward in the strategy are required to enable the MRT or will work better for people and their travel needs if the MRT is implemented first or in parallel.

Whether the MRT is a bus, tram or another form of transport, it will present a unique opportunity to enable wider transport improvements along the corridor which could lead to greater travel choice, improved journey times by public transport, improved air quality and healthier communities.

For example, local bus services could be improved so that they route via MRT interchanges which will help people to travel further and more easily by public transport. MRT could work alongside improvements to cycle and pedestrian routes along and across main roads, therefore connecting communities and providing better and more attractive links between people's homes, jobs, local shops and key services. It could encourage people to not travel by car and prompt longer distance through-traffic to divert away from town centres.

In Hertford, the MRT will need to make use of the A414 to reach the centre of town. This road experiences heavy through traffic flows and congestion. it is likely that the delivery of a successful MRT will require major changes in Hertford through the delivery of a Sustainable Travel Town and if necessary a larger strategic intervention, for example a bypass, that can remove through-traffic away from the town.



Current Issues

The A414 runs through the middle of Hertford. It comprises a dual carriageway with limited provision for cyclists and pedestrians to cross or walk/cycle alongside it. The road therefore creates a great deal of severance between the southern and northern parts of Hertford. Between the Hertford Loop overbridge and the Bluecoats roundabout, over a distance of around 1.4km, there are two at-grade signal-controlled pedestrian crossings and four underpasses.

Footway provision alongside the road is not continuous. For instance, between the A119 Parliament Square and A119 Bluecoats roundabouts there is no adjacent footway provision. The sparse provision of crossings or underpasses increases

walking/cycling distances and reduces the convenience of making journeys on foot and cycle.

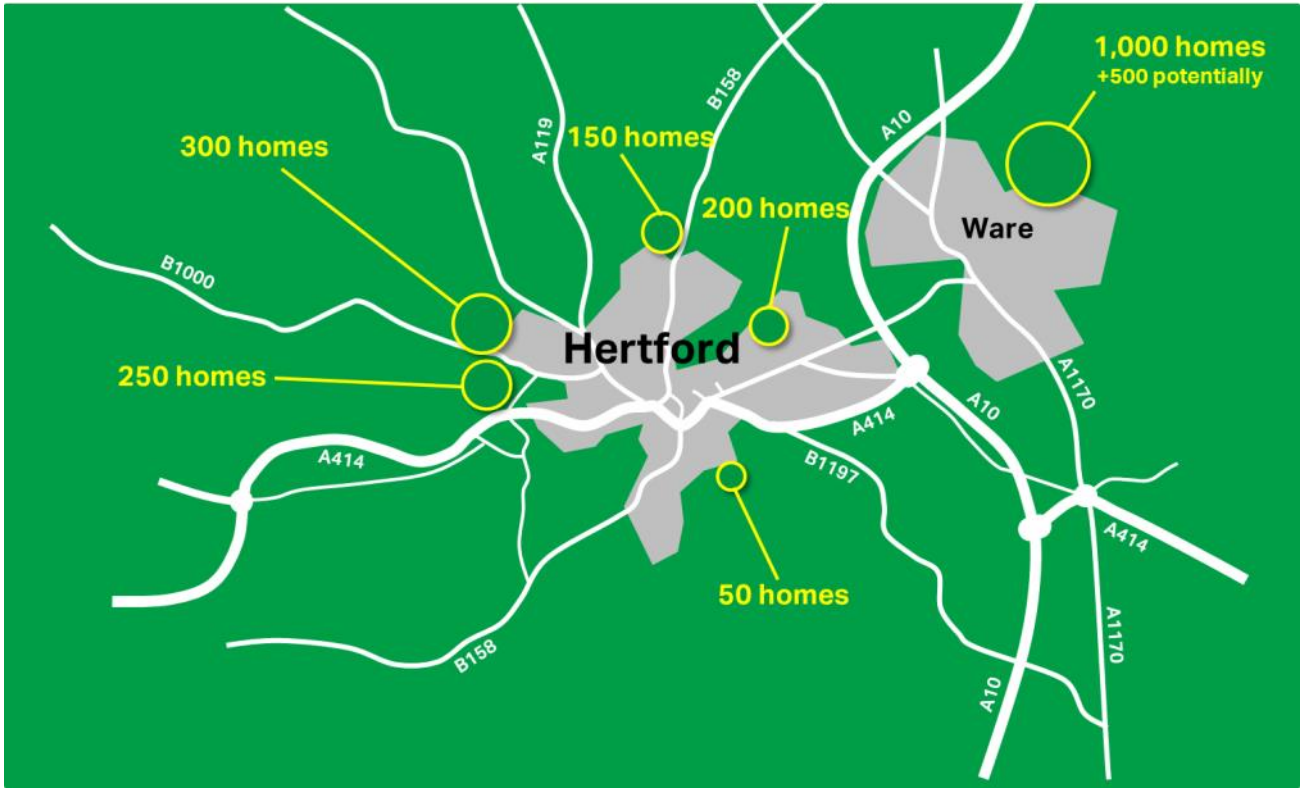
The A414 functions as both an urban distributor road connecting different parts of Hertford and as a strategic route for longer distance trips. Sections of it facilitate shorter distance trips within Hertford as well as acting as a primary through route between the A1(M) and A10 for private cars and freight. Frontage access onto the A414 is quite limited in parts, with many land uses facing away and segregated from the main road.

Severe traffic congestion, especially during weekday peak periods but during other parts of the day is a common occurrence on the A414 and adjoining roads within Hertford. These common issues are amplified when incidents occur on the M25 which motorists attempt to avoid by routing on the A414 through Hertford instead.

Air quality is a concern along the A414 in Hertford. An Air Quality Management Area (AQMA) is designated along the A414 Gascoyne Way broadly between the River Lea and junction with Mill Road. The pollutants declared are Nitrogen Dioxide (NO_2). The source of air quality issues is road traffic. The image to the right is sourced from DEFRA and shows the extent of the AQMA in Hertford.

Planned growth in population around Hertford and beyond

There is significant planned housing growth in and around Hertford. Around 950 new homes are proposed in the Pre-Submission East Herts District Plan and a further 1,000 in Ware, plus the potential for additional development and the scope for smaller developments (windfall) across the area. Development is also proposed to the east of Welwyn Garden City (within East Hertfordshire) and much further afield. These developments will place additional pressure on the surrounding transport network including the A414.



Potential consequences of doing nothing

Maintaining the status quo in Hertford in terms of transport provision is likely to lead to rising

congestion, delays and more rat-running on less appropriate roads in the town as travel demand increases. Local proposed developments may not be able to proceed in a sustainable manner. Rising congestion also represents a threat to prosperity and existing businesses in the town, and may deter potential new commercial development. Linked to this consequence, rising levels of predominantly highway-based travel demand will exacerbate air quality issues within Hertford.

Sustainable travel improvements

To address the current and future travel issues in Hertford, this Corridor Strategy identifies a package of sustainable travel improvements to be delivered in conjunction with the Mass Rapid Transit system through Hertford.

By routing on the A414 through Hertford, the Mass Rapid Transit system could encourage a mode shift towards more public transport use, which in turn could decrease congestion and improve air quality.

Sustainable travel improvements should not be limited to the A414 corridor through Hertford however.

A wider set of complementary improvements will be needed to encourage more sustainable travel behaviour across Hertford. These could include physical interventions including new on/off road cycle routes, widened footways, reduced speed limits to make the road environment less threatening to pedestrians and cyclists, additional cycle parking at or close to key destinations including the hospital, town centre and railway stations, the management of car parking and the potential reprioritisation of road space.

In order to achieve an efficient and fast Mass Rapid Transit through Hertford, it will not be feasible for MRT services to reach all parts of the town. The A414 corridor will therefore be the main focus of the system, with improved feeder routes linking to other parts of the town.

In addition, a wider set of initiatives to encourage more sustainable travel behaviour will be required, including travel plans for particular sites such as schools and businesses, as well as marketing and promotion.

Strategic Intervention

Once the preferred option for the Mass Rapid Transit system has been identified, further work is needed to determine whether a strategic intervention might be needed around Hertford to facilitate the sustainable travel improvements, including the MRT.

A range of strategic options are available for consideration to address the challenges in Hertford, including but not limited to the following:

- Widening, junction grade separation and tunnelling of the A414 through Hertford
- Heavy rail corridor
- Bypass around Hertford

It is envisaged that the MRT would facilitate a strategic intervention. To effectively address the severe traffic congestion issues on the A414 in Hertford it is likely that quite substantial highway works would be required. This could take the form of widening carriageways and converting existing at-grade roundabout junctions into much larger grade separated junctions comprising additional bridge structures. These types of works could improve traffic flows and reduce queues,

however in the longer run the additional road capacity could likely attract more traffic onto the A414 through the town (for instance motorists who currently avoid traffic congestion in Hertford, or people who currently use other modes of travel who may switch to the private car because of improved highway conditions). Furthermore, the scale of highway works which may be required to effectively address highway congestion could involve land-take on either side of the existing carriageway to accommodate additional carriageway lanes and larger junctions.

The A414 beneath the Hertford Loop railway bridge is only single carriageway width therefore to increase capacity here would involve demolition of the existing bridge and construction of a new wider railway bridge. This option would be both expensive and very disruptive. Also, this would diminish opportunities to improve pedestrian, cycle and public transport links which are impacted by the presence of a major road running through the middle of the town.

Tunnelling the A414 would reduce visual intrusion and noise. A tunnel through Hertford could have entry/exit portals for example west of the Hertford Loop railway bridge and south-east of the Bluecoats roundabout, or shorter sections of tunnels with intermediate junctions. Alternatively, a tunnel could be constructed around Hertford to form a bypass. Tunnelling is likely to be very expensive both in terms of construction and on-going maintenance and operations, and more expensive than a more conventional surface-level road.

The A414 is a primary east-west route carrying traffic through Hertford between the A10 and A1(M) corridors. There is no real public transport alternative. A heavy rail corridor option could therefore be considered. This option could comprise a two-track rail corridor linked to the East Coast Main Line, Hertford Loop and Hertford East branch line. Two tracks would enable trains travelling in opposite directions to pass each other which would increase service capacity and frequency.

The former railway alignments (which closed in the 1950s) have been partly built over and one section now forms part of the Cole Green Way cycle route. It would not therefore be feasible to reinstate this railway without the purchase and demolition of properties. Furthermore, the former railway routes were mostly single track and therefore land purchase and significant engineering would be required to facilitate a two-track railway which can carry more frequent services. Additional capacity may also be required on the existing railway routes that a new east-west railway would link to in the form of additional tracks, platforms and crossovers. It may not be feasible to provide an end-to-end rail service, although this would be required to attract some of the traffic through Hertford to rail. Instead, rail services may only shuttle between Welwyn Garden City or Hatfield and Hertford North, and between Hertford North and the Broxbourne area for example. A heavy rail route would also potentially work against a MRT system through Hertford.

Finally, a surface-level bypass either routing to the north or the south of Hertford could be considered. This option is likely to be less costly compared to tunnelling and a heavy rail corridor but presents risks in terms of adversely affecting the built and natural environment. Care would have to be taken in determining the location of the bypass to ensure that it shifts traffic out of Hertford.

Segment 11: Hertford

Packages Overview

Package 23 – Hertford Sustainable Travel Improvements

The overarching aim of Package 23 is:

To provide a step change in sustainable travel connectivity across Hertford through the provision of high quality pedestrian and cycle routes, crossings and public transport.

The Package consists of:

- Repurposing the A414 dual carriageway as a multi-modal sustainable transport corridor primarily serving local movements and access to Hertford, discouraging through trips which neither begin or end in the town.
- Delivering a step change in terms of high quality footway and cycle route provision, including removal of subways, introducing local bus priority and facilitating a Mass Rapid Transit system through Hertford.

The table below summarises the interventions in this package.

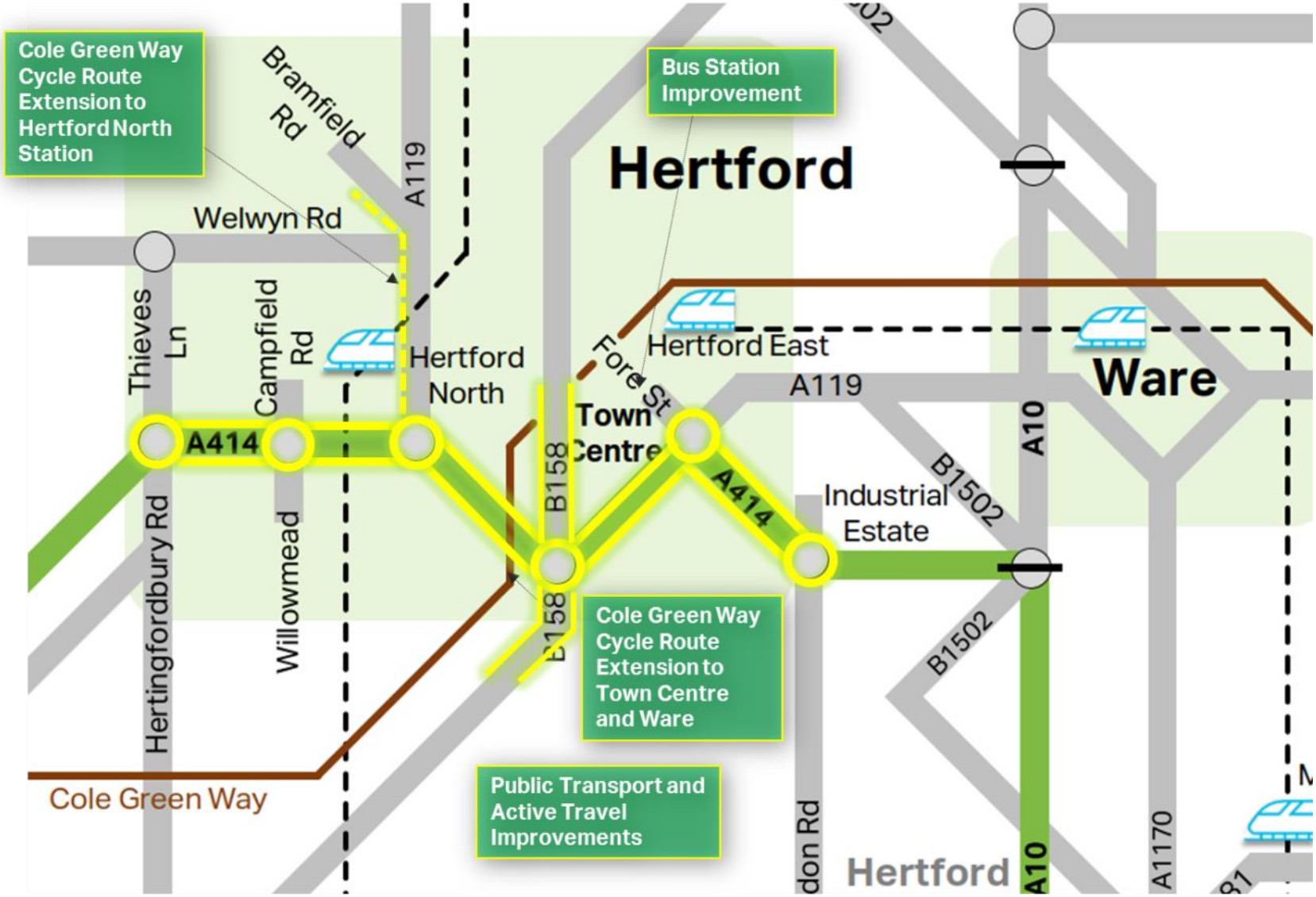
A414 Package 23 - Hertford Sustainable Travel Improvements		
Name	**Short Description**	**Estimated Cost Range**
Cole Green Way to Hertford North Station cycle route extension	Extension of cycle route from Cole Green Way to Hertford North Station (route 1 in Urban Transport Plan)	£1m - £2.5m
Cole Green Way to Hertford Town Centre and Ware cycle route extension	Extension of cycle route from Cole Green Way to town centre and Ware	£1m - £2.5m
Hertford Bus Station Improvement	Hertford Bus Station improvements	£1m - £2.5m
Hertford Public Transport and Active Travel Improvements	Improve public transport within Hertford to reduce amount of local traffic using A414 (development of local bus network), and improve environment and provision for active travel	£2.5m - £5m

The proposed improvements to Cole Green Way have been developed with consideration of the Cole Green Way Greenspace Action Plan and the Rights of Way Improvement Plan.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK23	TOTAL INDICATIVE COST RANGE ESTIMATE	£6m - £13m

Package 23 - summary map



Segment 11: Hertford

Packages Overview

Package 24 – Hertford Strategic Intervention

The overarching aim of Package 24 is:

Review the need for a strategic intervention to address high volumes of through traffic in Hertford and facilitate sustainable travel improvements including the MRT.

The table below summarises the interventions in this package.

A414 Package 24 - Hertford Strategic Intervention		
Name	**Short Description**	**Estimated Cost Range**
Hertford Strategic Intervention	Review the need for a strategic intervention, for example a bypass, to address high volumes of through traffic in Hertford and to facilitate the Mass Rapid Transit system and the sustainable travel interventions. Once further work has been done to identify the preferred option and route for the MRT, more work is needed to determine whether a strategic highway intervention is needed in Hertford.	To be determined

Given the uncertainties about what a strategic intervention could comprise, an indicative cost range estimate cannot be provided for this package. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

Segment 11 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or broader principles could be adopted at a later point to build upon the proposals in this segment.

The Corridor Strategy highlights the significance of the A414 road and the constraining effect it will continue to have on the town in discouraging more sustainable travel behaviour, making local trips on foot or by bike across the town more difficult, and restricting planned housing growth.

The Mass Rapid Transit is a critical piece of infrastructure and will be the enabler of a wider set of transport improvements across Hertford. Priority for MRT services may be required particularly on the approaches to key junctions, and this could mean that one of the lanes in each direction of the dual carriageway is converted to a bus lane.

In whatever form a MRT takes, at least one high quality interchange for MRT services would need to be provided in Hertford. This would be a major step-change from a conventional bus stop and would potentially incorporate a large shelter or waiting room, seating, WiFi connectivity, real-time-information and step-free access akin to a railway station platform.

A high quality cycle route could also be provided, with connections into the town centre and Cole Green Way.

A strategic intervention, for example a bypass, could be needed in this segment to facilitate the MRT and other sustainable travel improvements by attracting through traffic out of Hertford. Once the preferred option for the MRT is determined, more work is needed to assess whether a strategic intervention is necessary.

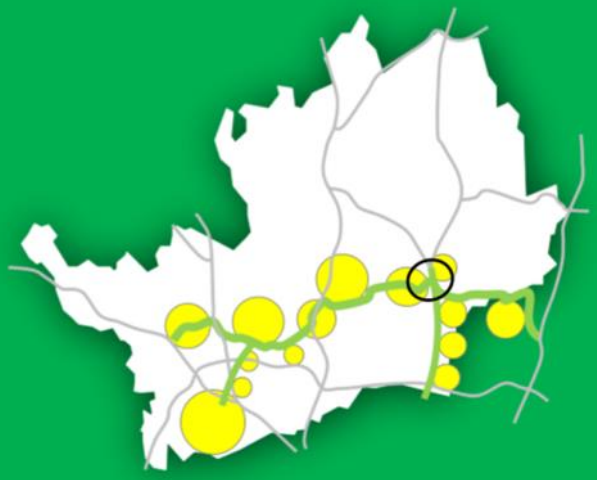
It is critical to ensure that if a strategic intervention removes traffic from the centre of Hertford, the remaining highway capacity is not then occupied by other motorists who are attracted to travel through Hertford.

A reinvented A414 corridor through the centre of Hertford can be the catalyst for further enhancements to sustainable travel across Hertford.

A414 Corridor Segment

12

Hertford-Rush Green



Segment 12: Hertford-Rush Green

Segment 12 represents the area between Hertford, Ware and Hoddesdon. In terms of transport, this segment is served by road, rail and local buses.

The A414 west connects into the A10 at the large, grade-separated Rush Green junction. The A414 then recommences to the south at the grade-separated Hailey Junction. A short distance to the east of the Hailey Junction is the large, six-arm Amwell roundabout. The A414 West and East, and the A10 are all high speed dual carriageway roads in this area.

Running broadly parallel to the A10 is the B1052 Stansted Road, a lower capacity country road with some local connectivity into Ware via Hoe Lane and Hertford Heath via Downfield Road.

The B1197 connects Hertford with Hoddesdon via the village of Hertford Heath. Whilst a B-road, it once had a higher status as an A-road and hence the single carriageway road is relatively wide, making it a popular route between the major urban settlements which 'cuts-the-corner' enabling motorists to avoid the A10.

The A119 is the main highway route between Hertford and Ware and is a busy urban road with houses, shops and business spread out alongside it. Hertford and Ware are quite closely spaced, less than 0.5km between each of the town's outer reaches. It is an intensively used corridor for motorists, pedestrians and local buses.

The Hertford East branch line of the West Anglia Main Line also serves this segment, with stations at Hertford East, Ware and St Margarets.

Ware town centre is located to the north of the A119 corridor, the railway line (via a level crossing) and the River Lea.

The A1170 runs north-south through Ware between the A10 and Hoddesdon via the Amwell roundabout.

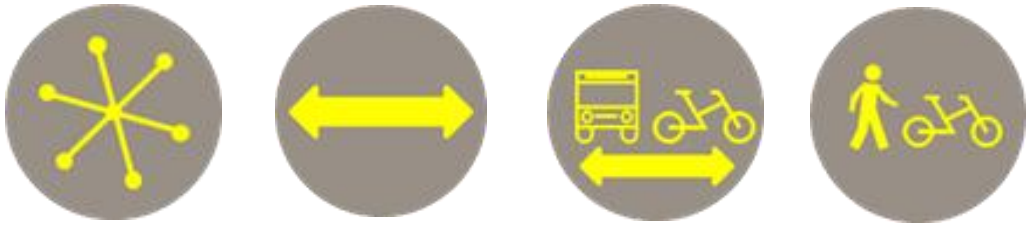
Segment 12 Summary (see Evidence Report for more detail)			
Trip	Long (>15km) 57%	Medium (5-15km) 28%	Short (0-5km) 15%
Key Infrastructure and Services	**Highway** • A414 is mostly dual-carriageway with a 60mph speed limit. • Ware Road (A119) is a single-carriageway 30mph parallel route to the A414 and connects Hertford to Ware directly. This route is used primarily for short trips between Hertford and Ware.		
	Public Transport • Hertford East railway station runs a direct half-hourly service to London Liverpool St via Ware and towns along the A10 corridor. • The residential Pinehurst area is served by the 333 bus which connects it to the town centre via the Ware Rd bus corridor.		
	Walking/Cycling • Hertford and Ware are connected by an off road cycle track along the River Lea (Hertford to Ware Towpath).		
Segment Challenges	**Highway Issues** • Foxholes roundabout and Rush Green roundabout are the two main congestion hotspots along this segment of the A414. They are both HCC defined hazardous sites. • The parallel A119 between Hertford and Ware also experiences congestion during the peak hours.		
	Public Transport Issues • No public transport issues have been identified in this segment.		
	Walking/Cycling Issues • The rate of cycle commuting between Hertford and Ware is high. However, could be increased further given the relatively high quality of the cycle route (Hertford – Ware Towpath). • Rates of cycling may be limited by the sparse and disconnected nature of cycle routes in the town centre of Hertford itself. • There is a strategic cycle route gap between Hertford and the A10 towns.		

Segment 12: Hertford-Rush Green

Segment 12 Priorities

An urban transport and travel network facilitating both local and interurban journeys, with the potential to increase uptake of active travel and public transport

- Bus access between Hertford and Ware along Ware Road (A119) will be at least maintained, if not improved, and potentially form part of a Mass Rapid Transit if reliable journey times can be achieved.
- There will be a focus on improving rail, bus and cycle route provision between Hertford and Ware.



Hertford—Rush Green travel conditions

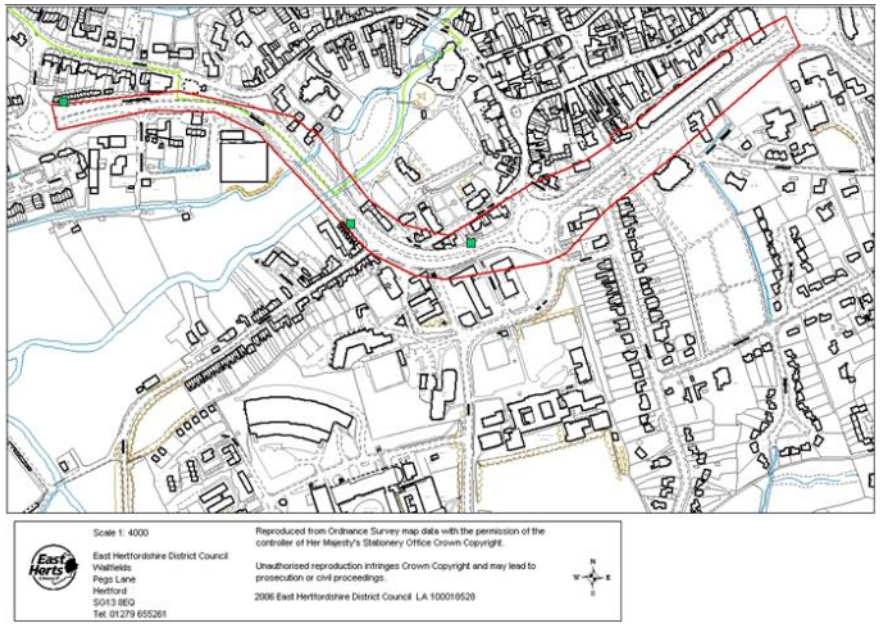
The MRT in Hertford

The MRT will be the priority piece of infrastructure for the A414 corridor. Some of the key proposals put forward in the strategy are required to enable the MRT or will work better for people and their travel needs if the MRT is implemented first or in parallel.

Whether the MRT is a bus, tram or another form of transport, it will present a unique opportunity to enable wider transport improvements along the corridor which could lead to greater travel choice, improved journey times by public transport, improved air quality and healthier communities.

For example, local bus services could be improved so that they route via MRT interchanges which will help people to travel further and more easily by public transport. MRT could work alongside improvements to cycle and pedestrian routes along and across main roads, therefore connecting communities and providing better and more attractive links between people's homes, jobs, local shops and key services. It could encourage people to not travel by car and prompt longer distance through-traffic to divert away from town centres.

In Hertford, the MRT will need to make use of the A414 to reach the centre of town. This road experiences heavy through traffic flows and congestion. it is likely that the delivery of a successful MRT will require major changes in Hertford through the delivery of a Sustainable Travel Town and if necessary a larger strategic intervention, for example a bypass, that can remove through-traffic away from the town.



Current Issues

The A414 runs through the middle of Hertford. It comprises a dual carriageway with limited provision for cyclists and pedestrians to cross or walk/cycle alongside it. The road therefore creates a great deal of severance between the southern and northern parts of Hertford. Between the Hertford Loop overbridge and the Bluecoats roundabout, over a distance of around 1.4km, there are two at-grade signal-controlled pedestrian crossings and four underpasses.

Footway provision alongside the road is not continuous. For instance, between the A119 Parliament Square and A119 Bluecoats roundabouts there is no adjacent footway provision. The sparse provision of crossings or underpasses increases

walking/cycling distances and reduces the convenience of making journeys on foot and cycle.

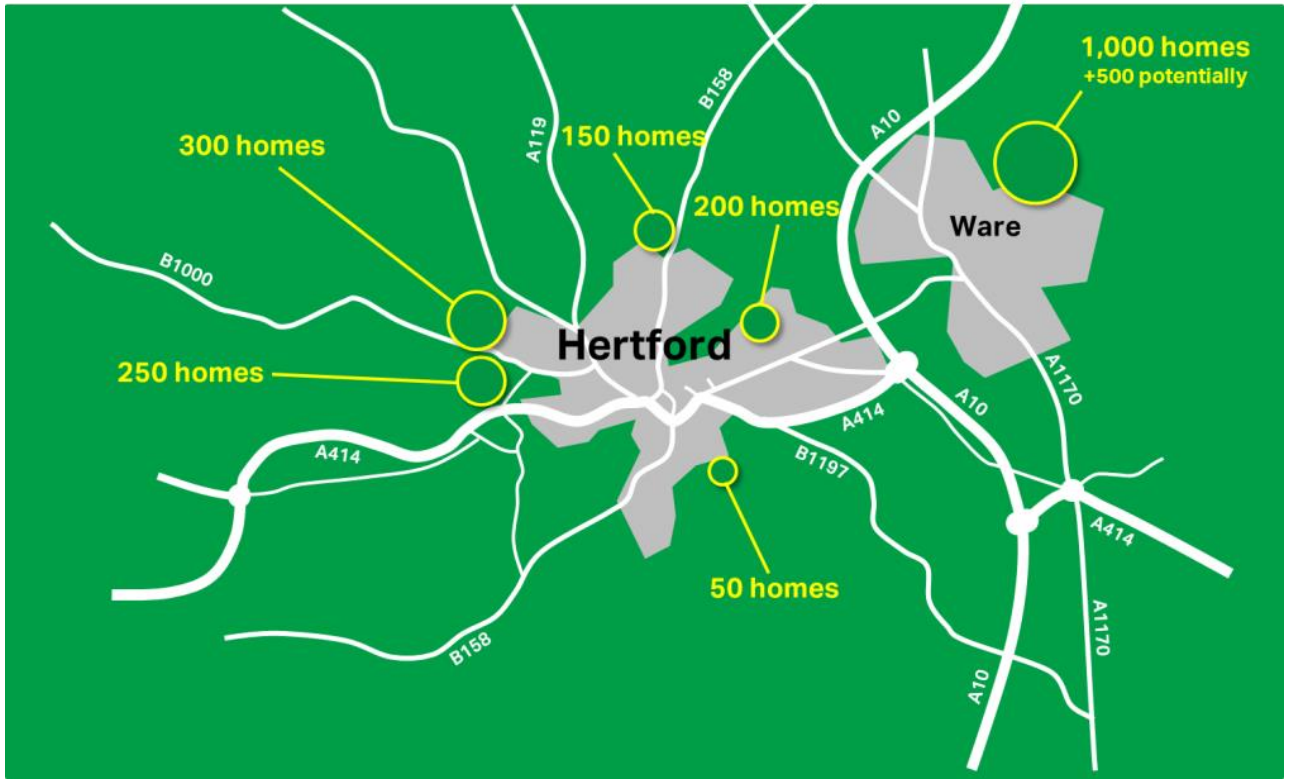
The A414 functions as both an urban distributor road connecting different parts of Hertford and as a strategic route for longer distance trips. Sections of it facilitate shorter distance trips within Hertford as well as acting as a primary through route between the A1(M) and A10 for private cars and freight. Frontage access onto the A414 is quite limited in parts, with many land uses facing away and segregated from the main road.

Severe traffic congestion, especially during weekday peak periods but during other parts of the day is a common occurrence on the A414 and adjoining roads within Hertford. These common issues are amplified when incidents occur on the M25 which motorists attempt to avoid by routing on the A414 through Hertford instead.

Air quality is a concern along the A414 in Hertford. An Air Quality Management Area (AQMA) is designated along the A414 Gascoyne Way broadly between the River Lea and junction with Mill Road. The pollutants declared are Nitrogen Dioxide (NO_2). The source of air quality issues is road traffic. The image to the right is sourced from DEFRA and shows the extent of the AQMA in Hertford.

Planned growth in population around Hertford and beyond

There is significant planned housing growth in and around Hertford. Around 950 new homes are proposed in the Pre-Submission East Herts District Plan and a further 1,000 in Ware, plus the potential for additional development and the scope for smaller developments (windfall) across the area. Development is also proposed to the east of Welwyn Garden City (within East Hertfordshire) and much further afield. These developments will place additional pressure on the surrounding transport network including the A414.



Potential consequences of doing nothing

Maintaining the status quo in Hertford in terms of transport provision is likely to lead to rising congestion, delays and more rat-running on less

appropriate roads in the town as travel demand increases. Economic efficiency is likely to suffer, and local proposed developments may not be able to proceed in a sustainable manner. Rising congestion also represents a threat to prosperity and existing businesses in the town, and may deter potential new commercial development. Linked to this consequence, rising levels of predominantly highway-based travel demand will exacerbate air quality issues within Hertford.

Sustainable travel improvements

To address the current and future travel issues in Hertford, this Corridor Strategy identifies a package of sustainable travel improvements to be delivered in conjunction with the Mass Rapid Transit system through Hertford.

By routing on the A414 through Hertford, the Mass Rapid Transit system could encourage a mode shift towards more public transport use, which in turn could decrease congestion and improve air quality.

Sustainable travel improvements should not be limited to the A414 corridor through Hertford however.

A wider set of complementary improvements will be needed to encourage more sustainable travel behaviour across Hertford. These could include physical interventions including new on/off road cycle routes, widened footways, reduced speed limits to make the road environment less threatening to pedestrians and cyclists, additional cycle parking at or close to key destinations including the hospital, town centre and railway stations, the management of car parking and the potential reprioritisation of road space.

In order to achieve an efficient and fast Mass Rapid Transit through Hertford, it will not be feasible for MRT services to reach all parts of the town. The A414 corridor will therefore be the main focus of the system, with improved feeder routes linking to other parts of the town.

In addition, a wider set of initiatives to encourage more sustainable travel behaviour will be required, including travel plans for particular sites such as schools and businesses, as well as marketing and promotion.

Strategic Intervention

Once the preferred option for the Mass Rapid Transit system has been identified, further work is needed to determine whether a strategic intervention might be needed around Hertford to facilitate the sustainable travel improvements, including the MRT.

A range of strategic options are available for consideration to address the challenges in Hertford, including but not limited to the following:

- Widening, junction grade separation and tunnelling of the A414 through Hertford
- Heavy rail corridor
- Bypass around Hertford

It is envisaged that the MRT would facilitate a strategic intervention. To effectively address the severe traffic congestion issues on the A414 in Hertford it is likely that quite substantial highway works would be required. This could take the form of widening carriageways and converting existing at-grade roundabout junctions into much larger grade separated junctions comprising additional bridge structures. These types of works could improve traffic flows and reduce queues,

however in the longer run the additional road capacity could likely attract more traffic onto the A414 through the town (for instance motorists who currently avoid traffic congestion in Hertford, or people who currently use other modes of travel who may switch to the private car because of improved highway conditions). Furthermore, the scale of highway works which may be required to effectively address highway congestion could involve land-take on either side of the existing carriageway to accommodate additional carriageway lanes and larger junctions.

The A414 beneath the Hertford Loop railway bridge is only single carriageway width therefore to increase capacity here would involve demolition of the existing bridge and construction of a new wider railway bridge. This option would be both expensive and very disruptive. Also, this would diminish opportunities to improve pedestrian, cycle and public transport links which are impacted by the presence of a major road running through the middle of the town.

Tunnelling the A414 would reduce visual intrusion and noise. A tunnel through Hertford could have entry/exit portals for example west of the Hertford Loop railway bridge and south-east of the Bluecoats roundabout, or shorter sections of tunnels with intermediate junctions. Alternatively, a tunnel could be constructed around Hertford to form a bypass. Tunnelling is likely to be very expensive both in terms of construction and on-going maintenance and operations, and more expensive than a more conventional surface-level road.

The A414 is a primary east-west route carrying traffic through Hertford between the A10 and A1(M) corridors. There is no real public transport alternative. A heavy rail corridor option could therefore be considered. This option could comprise a two-track rail corridor linked to the East Coast Main Line, Hertford Loop and Hertford East branch line. Two tracks would enable trains travelling in opposite directions to pass each other which would increase service capacity and frequency.

The former railway alignments (which closed in the 1950s) have been partly built over and one section now forms part of the Cole Green Way cycle route. It would not therefore be feasible to reinstate this railway without the purchase and demolition of properties. Furthermore, the former railway routes were mostly single track and therefore land purchase and significant engineering would be required to facilitate a two-track railway which can carry more frequent services. Additional capacity may also be required on the existing railway routes that a new east-west railway would link to in the form of additional tracks, platforms and crossovers. It may not be feasible to provide an end-to-end rail service, although this would be required to attract some of the traffic through Hertford to rail. Instead, rail services may only shuttle between Welwyn Garden City or Hatfield and Hertford North, and between Hertford North and the Broxbourne area for example. A heavy rail route would also potentially work against a MRT system through Hertford.

Finally, a surface-level bypass either routing to the north or the south of Hertford could be considered. This option is likely to be less costly compared to tunnelling and a heavy rail corridor but presents risks in terms of adversely affecting the built and natural environment. Care would have to be taken in determining the location of the bypass to ensure that it shifts traffic out of Hertford.

Segment 12: Hertford-Rush Green

Packages Overview

Package 24 – Hertford Strategic Intervention

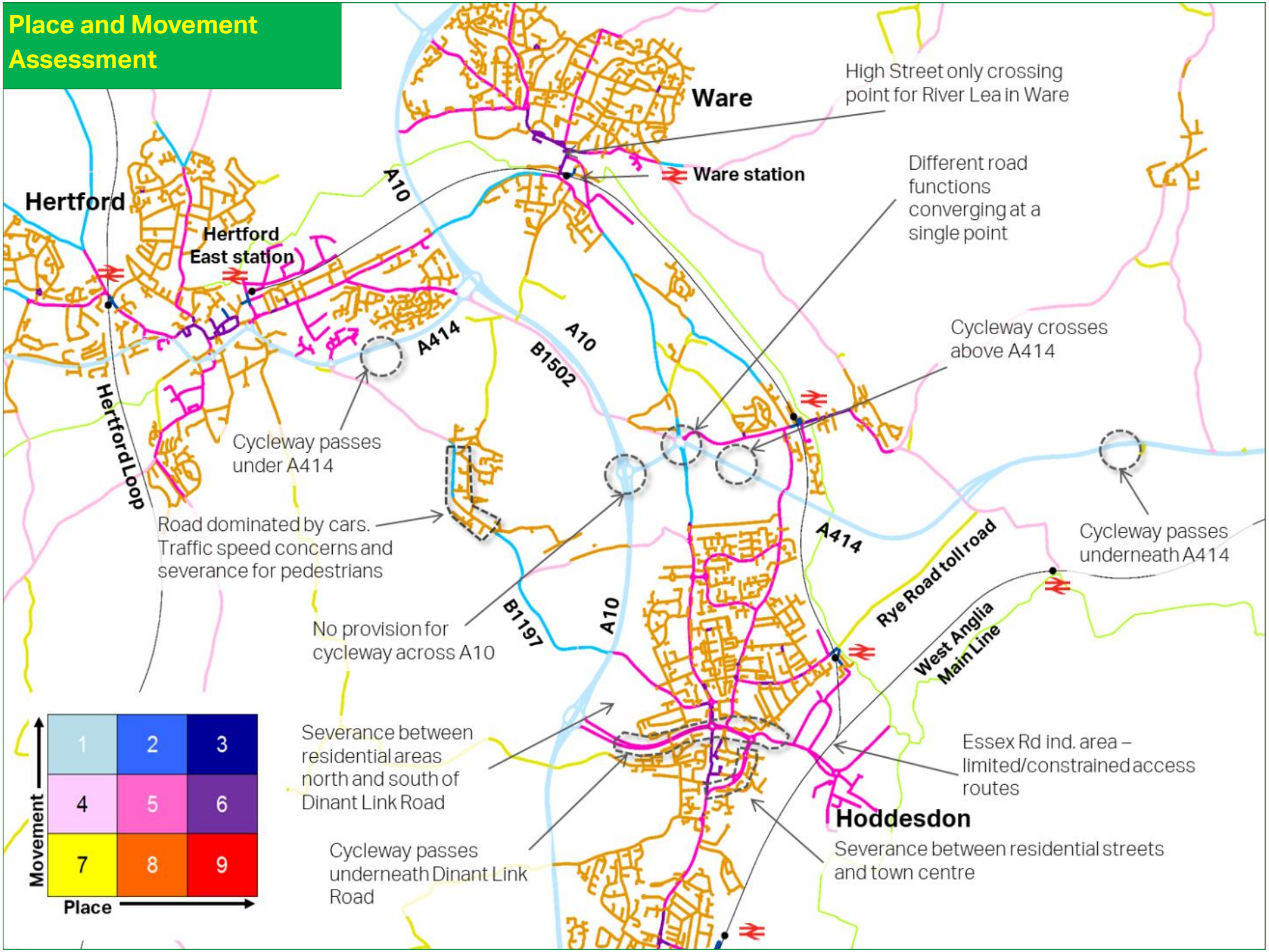
The overarching aim of Package 24 is:

Review the need for a strategic intervention to address high volumes of through traffic in Hertford and facilitate sustainable travel improvements including the MRT.

The table below summarises the interventions in this package.

A414 Package 24 - Hertford Strategic Intervention		
Name	**Short Description**	**Estimated Cost Range**
Hertford Strategic Intervention	Review the need for a strategic intervention, for example a bypass, to address high volumes of through traffic in Hertford and to facilitate the Mass Rapid Transit system and the sustainable travel interventions. Once further work has been done to identify the preferred option and route for the MRT, more work is needed to determine whether a strategic highway intervention is needed in Hertford.	To be determined

Given the uncertainties about what a strategic intervention could comprise, an indicative cost range estimate cannot be provided for this package. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.


Place and Movement Assessment
Ware
High Street only crossing point for River Lea in Ware
Ware station
Different road functions converging at a single point
Hertford
Hertford East station
A10
A414
B1502
Hertford Loop
Cycleway crosses above A414
Cycleway passes under A414
Road dominated by cars. Traffic speed concerns and severance for pedestrians
No provision for cycleway across A10
B1197
Rye Road toll road
West Anglia Main Line
Cycleway passes underneath A414
Movement
Place
1
2
3
4
5
6
7
8
9
Severance between residential areas north and south of Dinant Link Road
Essex Rd ind. area – limited/constrained access routes
Hoddesdon
Severance between residential streets and town centre
Cycleway passes underneath Dinant Link Road

Segment 12 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

Cycle provision between Hertford and Hoddesdon is lacking. New inter-urban cycle provision could be explored, perhaps with dedicated on or off-road provision along the B1197 and/or B1502.

A Mass Rapid Transit could also route through this segment with services from Hertford routing towards Harlow and the Broxbourne Towns. The exact form and alignment and composition of a MRT will need to be investigated further, however it could route through Ware, Amwell and Stanstead St Margarets or bypass these areas (as they are already well served by local buses and rail), instead routing via the A10. Consideration may therefore be needed for an out-of-town parkway interchange which could be provided close to the A414/A1170 Amwell junction, with good feeder connections for pedestrians, cyclists and local buses to surrounding settlements including the Amwell and Stanstead villages, and the Hailey area of Hoddesdon.

The Mass Rapid Transit is a critical piece of infrastructure and will be the enabler for a wider set of transport improvements across the corridor. In Segment 11, a strategic intervention, for example a bypass, might be needed to enable the MRT. If a strategic intervention were to be taken forward, its alignment may or may not influence this segment.

The MRT in addition to a strategic intervention will likely have some effect on existing local connections within Segment 12.

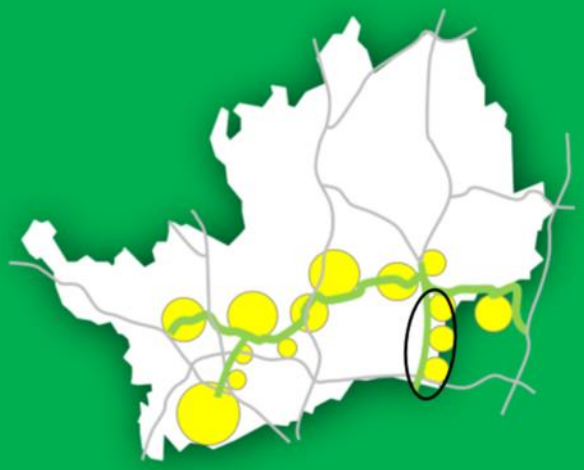
The attractiveness of local routes within this segment could change as could journey patterns and mode choice. It will be important to ensure that local routes do not become more attractive rat-runs. The desired place and movement function of the B1197 through Hertford Heath for instance should primarily be to serve the needs of residents and visitors to the village and not to facilitate the movement of people between the Broxbourne Towns and Hertford particularly by private car. Similarly, the local function of the B1052 Stansted Road needs to be preserved and enhanced.

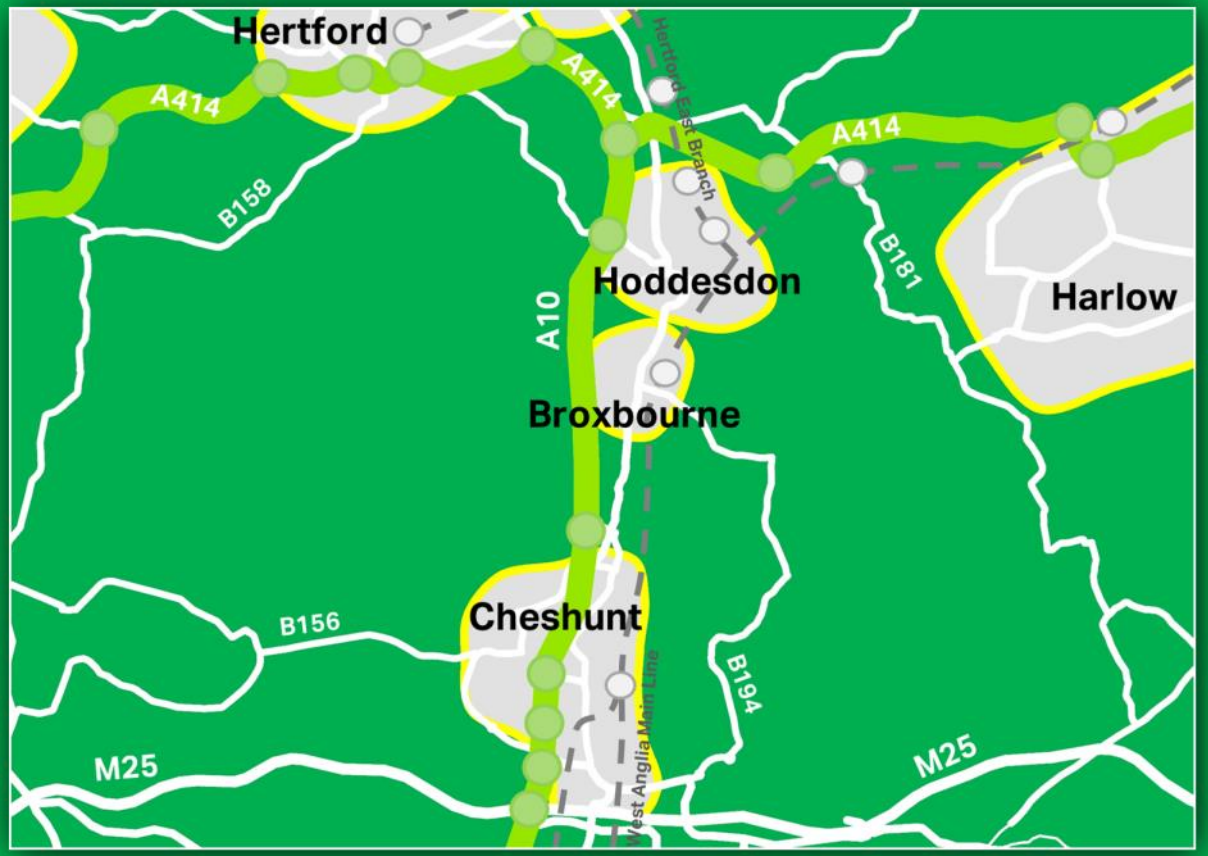
The operation and performance of the Amwell Roundabout, which can experience congestion, will need to be considered in more detail, especially in the context of a possible MRT routing through it or near to it, and the impact of planned growth in the surrounding area.

A414 Corridor Segment

13

Broxbourne Towns





Segment 13: Broxbourne Towns

The borough of Broxbourne is situated to the south of the A414 corridor in the within the Upper Lee Valley. East Hertfordshire lies to the north, Epping Forest to the east, Enfield to the south and Welwyn Hatfield to the west. The M25 demarcates the southern boundary of the Borough and the River Lee demarcates the eastern boundary. The Broxbourne area has been incorporated into the Corridor Strategy in recognition of the close ties in terms of travel and transport, in particular the A10, bus and rail links.

The main towns of Hoddesdon, Cheshunt and Waltham Cross are linked by smaller settlements such as Broxbourne, Wormley and Turnford. These form a near continuous north south corridor of development which is bordered by the West Anglia Main Line and Lee Valley Regional Park to the east and the A10 and countryside to the west. Cheshunt also extends westwards over the A10.

The A10 and West Anglia Main Line are the most significant transport routes through Broxbourne providing north-south connectivity. Rail services route toward London Liverpool Street station. There are stations at Rye House (serving Hoddesdon, on the Hertford East branch line), Broxbourne, Cheshunt, Waltham Cross and Theobalds Grove (on the Southbury branch line). Greater Anglia rail services route northwards toward Hertford East via Ware, Harlow, Bishop's Stortford and Cambridge. London Overground services terminate at Cheshunt.

The A10 is formed of a dual carriageway road. The section through Cheshunt is more of an urban dual carriageway, flanked by buildings with access onto the road, signalised crossings for pedestrians and lower speed limits. The A10 experiences traffic congestion especially during peak times through the Broxbourne area. The A10 connects with the M25 at Junction 25 where Highways England is proposing a mitigation scheme to reduce congestion. To the north the A10 links with the A414 at the large, grade separated Hailey junction. Immediately to the east is the large, busy Amwell roundabout.

The A1170 and B176 also form an important north-south corridor for more local trips through many of the towns.

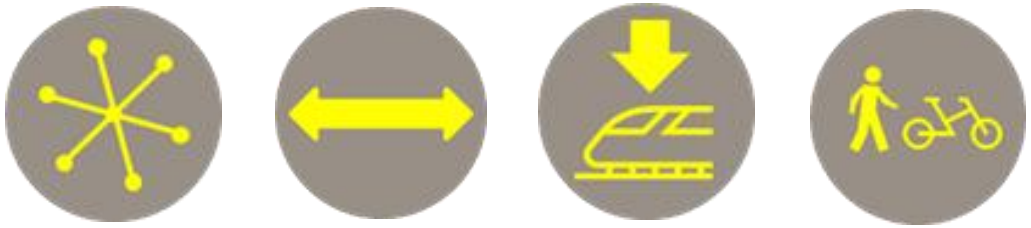
Segment 13 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 84%	Medium (5-15km) 16%	Short (0-5km) 0%
Key Infrastructure and Services	**Highway** • A10 is mostly dual-carriageway with a 70mph speed limit. • A10 connects Hoddesdon, Broxbourne, and Cheshunt to towns along the A414, as well as to the M25. • Parallel to the A10 is the local A1170 (30mph).		
	Public Transport • West Anglia Main Line runs parallel to the A10 • Trains to London in the AM Peak serve Cheshunt 7 times an hour, Rye House (Hoddesdon) 3 times an hour, and 6 times an hour from Broxbourne.		
	Walking/Cycling • There is very limited cycle infrastructure along the A1170 and B176. Lee Valley Park offers well established north/south cycling connectivity across the border in Essex.		
Segment Challenges	**Highway Issues** • AQMA in Waltham Cross. • The main junction related congestion is found at A10/A121/B198 roundabout and M25 J25. • Peak hour congestion extends along most local parallel route from Hoddesdon to Waltham Cross (A1170 and B176). • Several HCC defined hazardous sites.		
	Public Transport Issues • PT accessibility heavily reliant on the north/south rail line. Accessibility to/ from areas to the west/east of this line is significantly lower e.g. Epping, Harlow, Potters Bar, Cuffley.		
	Walking/Cycling Issues • Off-road cycling infrastructure in the Lee Valley Park. However, the route is relatively indirect for north-south travel. • Rates of cycling to work are relatively low. • There is a strategic cycle route gap between Hertford and the A10 towns.		

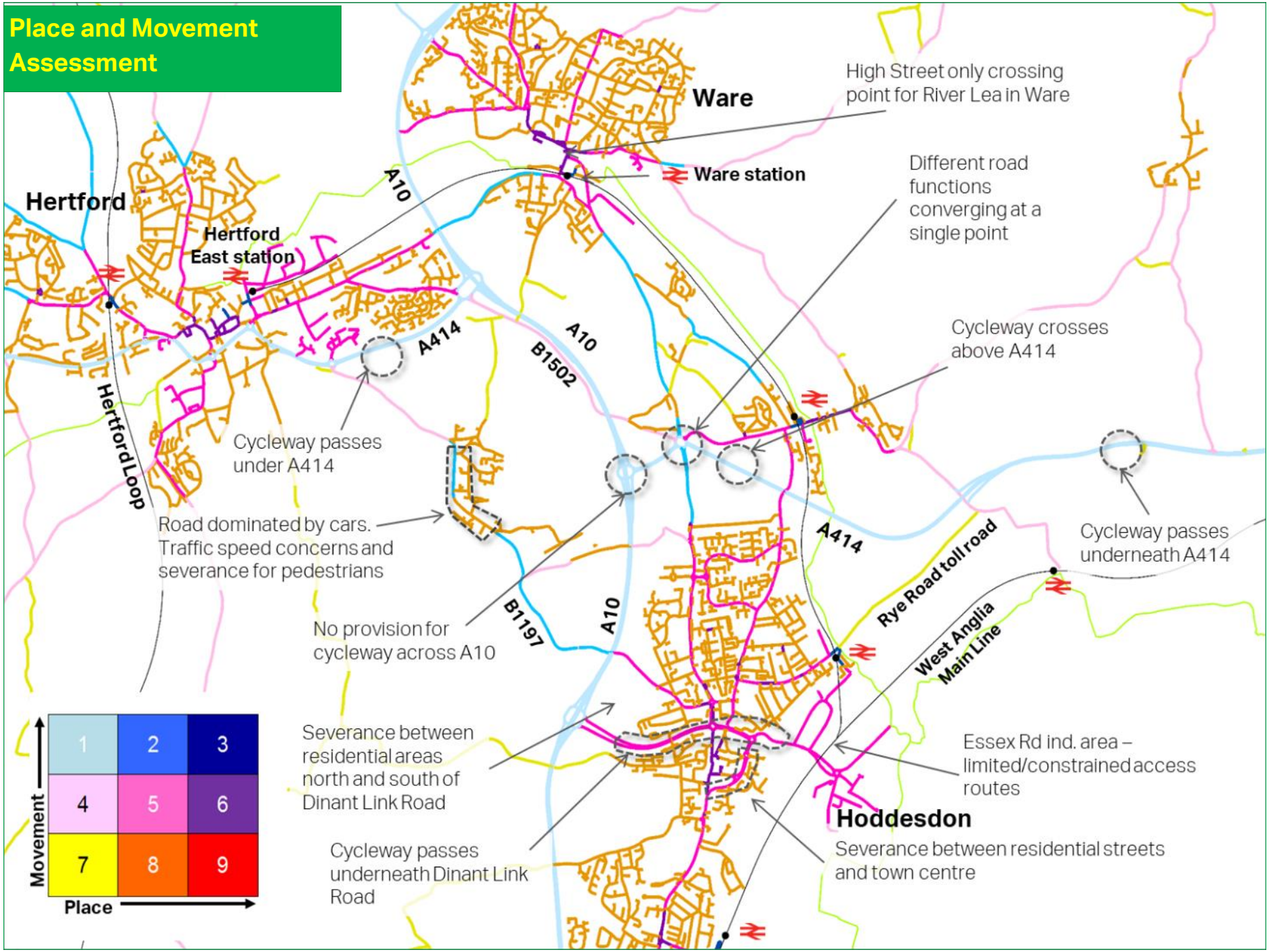
Segment 13: Broxbourne Towns

Segment 13 Priorities

An interurban transport corridor facilitating a mixture of journeys, with a need to improve east-west transport connections

- A10 will continue to serve as a more strategic route connecting the A414 to the M25 for longer distance trips.
- Junctions along the A10 will be improved to help relieve traffic congestion and ensure north-south traffic uses the A10 rather than the A1170/B176 through Hoddesdon and Cheshunt (including the various high streets).
- The West Anglia Main Line will continue to provide an important north-south connection, which may be furthered by the development of Crossrail 2 (a longer term aspiration being investigated by TfL) and new stations in the longer term. Initiatives to improve walking and cycling access to local stations is a priority.
- Public transport links east-west across Broxbourne need improvement, such as new and upgraded bus services which provide accessibility to the rail stations in the east, and better pedestrian, cyclist and bus access to Brookfield retail centre.
- Cycling improvements are required throughout the Broxbourne Towns, to complement the north-south connectivity provided by cycle routes in the Lee Valley Park.
- Onward links by bike to Hertford and Enfield need to be provided and key obstacles such as major highway junctions addressed through dedicated crossings.
- Good accessibility to new development sites, such as Brookfield, for all modes will be critical. Increased highway capacity to help manage development and ensure a more appropriate routing of traffic on surrounding roads will also be required.




Place and Movement Assessment
Ware
High Street only crossing point for River Lea in Ware
Ware station
Different road functions converging at a single point
Hertford
Hertford East station
A10
A414
B1502
Cycleway crosses above A414
Cycleway passes under A414
Hertford Loop
Road dominated by cars. Traffic speed concerns and severance for pedestrians
No provision for cycleway across A10
B1197
Rye Road toll road
West Anglia Main Line
Cycleway passes underneath A414
Movement
Place
1
2
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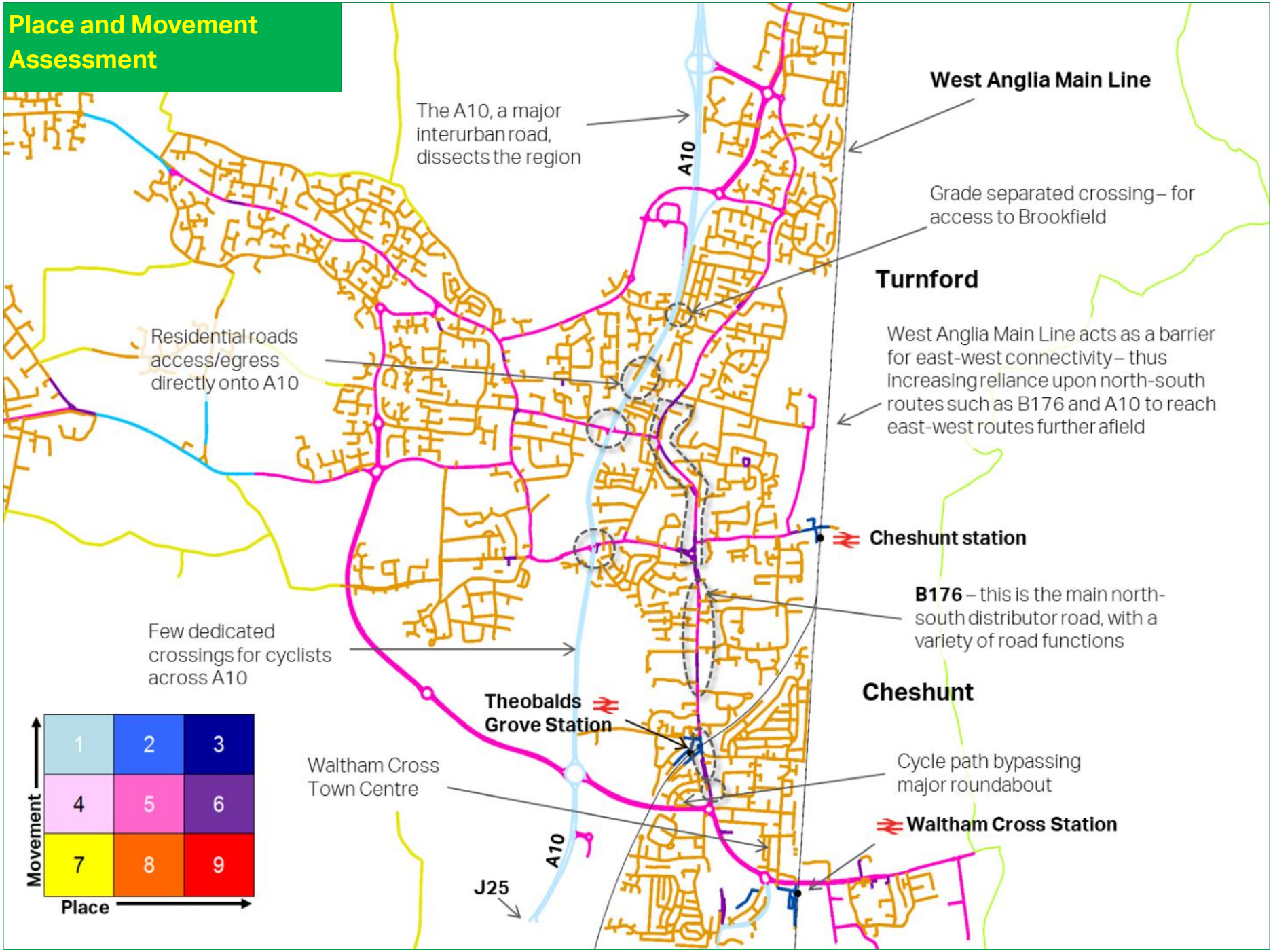
9
Severance between residential areas north and south of Dinant Link Road
Essex Rd ind. area – limited/constrained access routes
Hoddesdon
Severance between residential streets and town centre
Cycleway passes underneath Dinant Link Road


Place and Movement Assessment
The A10, a major interurban road, dissects the region
A10
West Anglia Main Line
Grade separated crossing – for access to Brookfield
Turnford
Residential roads access/egress directly onto A10
West Anglia Main Line acts as a barrier for east-west connectivity – thus increasing reliance upon north-south routes such as B176 and A10 to reach east-west routes further afield
Cheshunt station
B176 – this is the main north-south distributor road, with a variety of road functions
Few dedicated crossings for cyclists across A10
Cheshunt
Theobalds Grove Station
Waltham Cross Town Centre
Cycle path bypassing major roundabout
Waltham Cross Station
A10
J25
Movement
Place
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Segment 13: Broxbourne

Packages Overview

Package 25 – Brookfield Connectivity

(The interventions in this package are identified in the adopted Broxbourne Transport Strategy. The exact estimated costs have been referenced unless no estimation was provided, in which case an assessment of estimated cost range was undertaken for the Corridor Strategy)

The overarching aim of Package 25 is:

To provide transport improvements to facilitate better connectivity and access between major growth planned at Brookfield and the wider Broxbourne area.

The Package consists of:

- New site accesses to the proposed Brookfield Garden Village development
- A new link road and connection to the A10 at Turnford
- Junction improvements in the area to address congestion and to support growth by mitigating the impacts of additional traffic in the area.

The table below / overleaf summarises the interventions in this package.

A414 Package 25 - Brookfield		
Name	**Short Description**	**Estimated Cost**
Waltham Cross Station to Brookfield bus service	Provide a new bus service running every 20 minutes between Waltham Cross Station and Brookfield via Cheshunt Station, Delamare Road and Hertford Regional College.	£6m
Turnford Link Road	Construction of a Halfhide Lane to Turnford Interchange Link Road, together with provision of a new western arm at the A10 Turnford Interchange	£8m

continued overleaf

Segment 13: Broxbourne

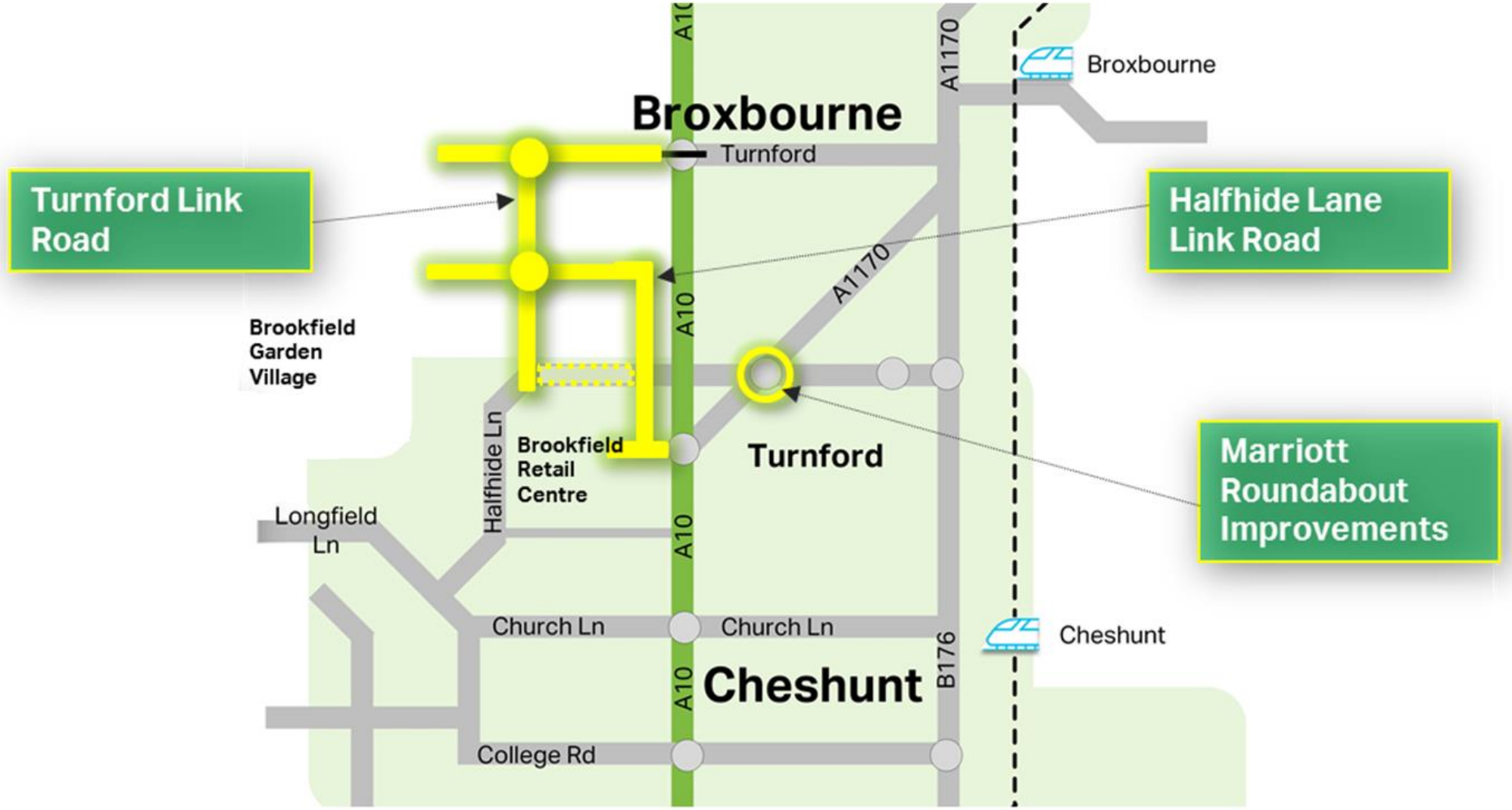
A414 Package 25 (continued)		
Name	**Short Description**	**Estimated Cost**
Halfhide Lane Link Road	Construction of new link road immediately to the west of the A10 providing a link from Halfhide Lane north to Hells Wood, where it turns westwards to connect to the Turnford Link Road via a new roundabout, and south to 'The Links' to provide access to Tesco and from the A10 off-slip.	£6m
Garden Village Distributor Road	Provision of new distributor road to serve the new Brookfield development.	£5m
Brookfield junction improvements	Reconfiguration of the 4-arm signalised junction on Halfhide Lane at junction with The Links and the access road into Brookfield Retail Park, by removing access to/from The Links and allowing only movements into (and not out of) the Retail Park.	£200k
Marriott roundabout improvements	Provision of additional capacity at Marriott Roundabout	£200k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 25	**TOTAL INDICATIVE COST ESTIMATE**	**£25m**

Segment 13: Broxbourne

Package 25 - summary map



Segment 13: Broxbourne

Packages Overview

Package 26 – Broxbourne Public Transport Improvements

(The interventions in this package are identified in the adopted Broxbourne Transport Strategy. The exact estimated costs have been referenced unless no estimation was provided, in which case an assessment of estimated cost range was undertaken for the Corridor Strategy)

The overarching aim of Package 26 is:

To provide a range of enhancements to public transport services and infrastructure which encourage a modal shift from private car for journeys within, into and out of the Broxbourne area

The Package consists of:

- New and re-routed bus services crossing the Broxbourne area, including between the Park Plaza employment area, Brookfield and Waltham Cross
- Provide a complementary set of enhancements including real time information and integrated ticketing

The table below / overleaf summarises the interventions in this package.

A414 Package 26 - Broxbourne PT Improvements		
Name	**Short Description**	**Estimated Cost**
High Leigh to Broxbourne bus service	Provide a new bus service running every 30 minutes between High Leigh and Broxbourne Station via Hoddesdon Town Centre.	£3m
Waltham Cross Station to Brookfield bus service	Provide a new bus service running every 20 minutes between Waltham Cross Station and Brookfield via Cheshunt Station, Delamare Road and Hertford Regional College.	£6m
Park Plaza to Waltham Cross Station bus service	Provide a new bus service running every 15 minutes between Park Plaza and Waltham Cross Station via Waltham Cross Town Centre.	£3m
Re-routing of the 242 bus	Re-route the existing 242 bus service between Potters Bar and Waltham Cross into the Rosedale Park North development site to provide a service every 30 minutes.	£1m - £2.5m

continued overleaf

A414 Package 26 (continued)		
Name	**Short Description**	**Estimated Cost**
Broxbourne bus stop upgrades	Provide new and upgraded bus stops across the Borough including shelters, seating, lighting, raised kerbs, and timetables	£500k
Selective Vehicle Detection systems	Introduce Selective Vehicle Detection systems to provide priority for buses along the old A10 at (i) Junction of Station Road / High Road, Broxbourne, (ii) Vancouver Road / A1170, Turnford, (iii) Church Lane / Turners Hill, Cheshunt, and (iv) Old Pond, Cheshunt.	£80k
Waltham Cross bus station shelters	Provision of new and improved bus shelters at Waltham Cross Train station to be served by extension of existing services from Waltham Cross Bus Station.	£25k
Real time bus information	Provide real time information displays at bus stops on all commercial routes.	£150k
Real time bus information	Provide real time information displays in areas which generate a large number of trips (i.e. doctors surgeries, shopping centres and train stations).	£30k
Broxbourne integrated ticketing	Promotion of the existing Intalink mobile app (an electronic ticket for use on buses across the County)	£250k
Broxbourne integrated ticketing	Development of an integrated BUSnet ticket for Broxbourne, allowing passengers to purchase one ticket for unlimited travel on all services within a given zone, improving the ease of interchange and reducing the cost of bus travel.	£250k
Cheshunt Station bus stop route improvements	Improve pedestrian links between Cheshunt Station and bus stops being provided as part of the Delamare Road development.	£100k

The interventions in this package are distributed across the Broxbourne area and are therefore not highlighted on a map. More detailed information on the interventions presented in Package 26 can be found in the adopted Broxbourne Transport Strategy (Broxbourne Borough Council, 2017).

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 26	**TOTAL INDICATIVE COST RANGE**	**£14m - £16m**

Segment 13: Broxbourne

Package 27 – Park Plaza improvements (Cheshunt)

(The interventions in this package and their estimated costs are identified in the adopted Broxbourne Transport Strategy)

The overarching aim of Package 27 is:

To provide a combination of highway and public transport improvements to facilitate planned employment-led development at Park Plaza.

The Package consists of:

- New railway stations at Turnford and Park Plaza
- New pedestrian and cycle bridges over the railway lines to reduce severance
- Highway improvements to help facilitate planned employment development

The table below / overleaf summarises the interventions in this package.

A414 Package 27 - Park Plaza improvements		
Name	**Short Description**	**Estimated Cost**
Park Plaza to Waltham Cross bus service	Provide a new bus service running every 15 minutes between Park Plaza and Waltham Cross Station via Waltham Cross Town Centre.	£3m
Turnford railway station	New station at Turnford between Cheshunt and Broxbourne stations on the West Anglia Main Line with links to the village	£20m
Park Plaza railway station	New station at Park Plaza West on the Southbury branch, served by Overground services, between Theobalds Grove and Turkey Street stations, with links to the major employment area	£10m
Park Lane bridge	Provide a pedestrian / cycle bridge at Park Lane to cross the railway line and allow access into Park Plaza North.	£2m
Park Plaza bridge	Provide a pedestrian / cycle bridge over the A10 between Park Plaza North and Park Plaza West.	£2m

continued overleaf

Segment 13: Broxbourne

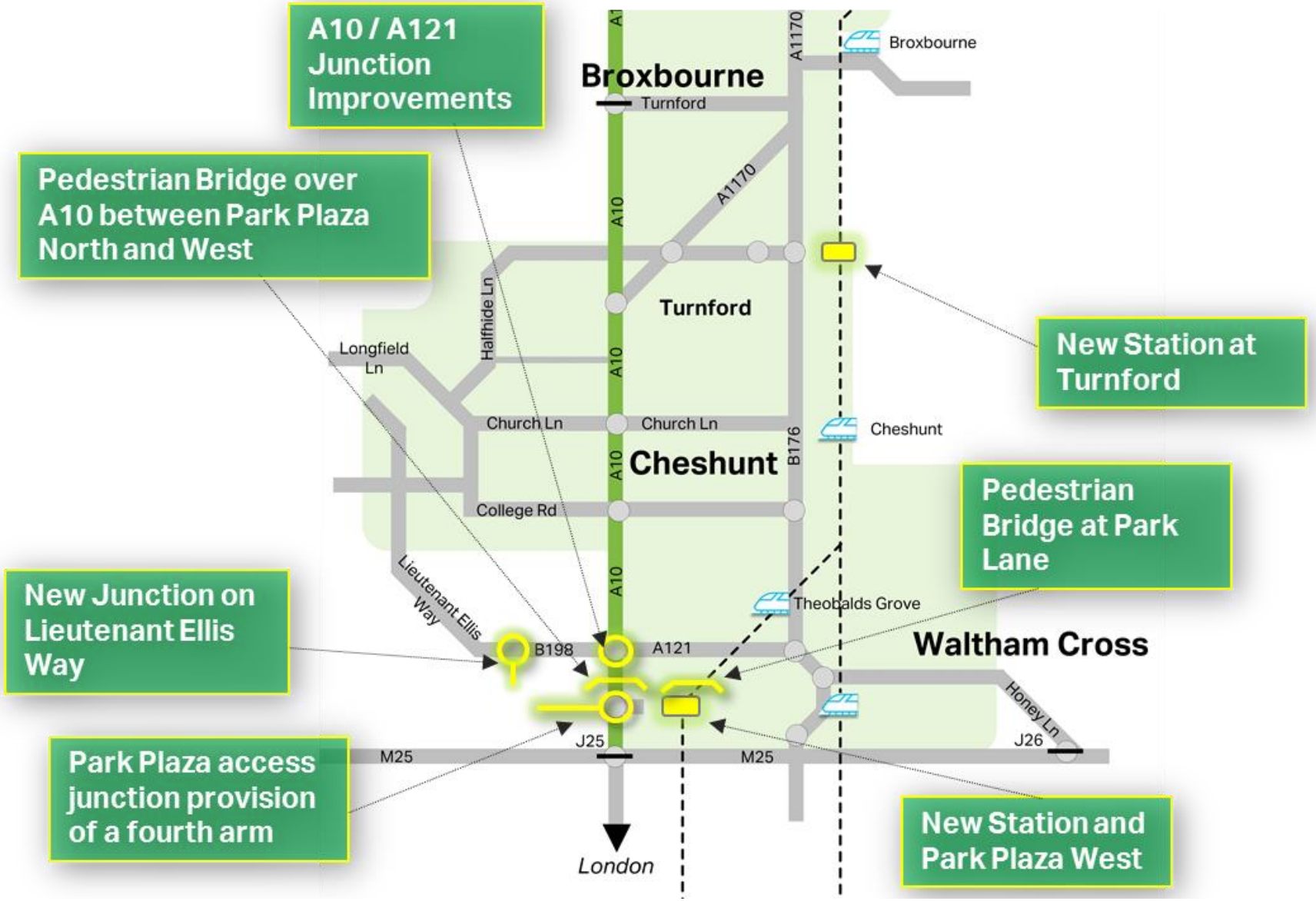
A414 Package 27 (continued)		
Name	**Short Description**	**Estimated Cost**
A10 Park Plaza junction improvements	Modify existing 3-arm junction on A10 to provide an at-grade 4-arm junction for access into Park Plaza North & West.	£500k
A10/A121 junction improvements	Provide a 'hamburger' style signalised junction with N/S priority at the intersection of the A10 junction with the A121 Monarch's Way and B198 Lieutenant Ellis Way (Park Plaza junction).	£7.7m
Lieutenant Ellis Way junction	Lieutenant Ellis Way: New 4-arm junction on Lieutenant Ellis Way to the north of Park Plaza.	£750k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 27	**TOTAL INDICATIVE COST ESTIMATE**	**£46m**

Segment 13: Broxbourne

Package 27 - summary map



Segment 13: Broxbourne

Packages Overview

Package 28 – Road Improvements across Broxbourne

(The interventions in this package and their estimated costs are identified in the adopted Broxbourne Transport Strategy)

The overarching aim of Package 28 is:

To improve the highway network across Broxbourne to help manage traffic congestion and support sustainable economic growth.

The Package consists of:

- Junction and capacity improvements to the north of Hoddesdon Town Centre
- Access improvements to Broxbourne station and secondary schools
- Junction improvements on the A10 through Cheshunt
- Junction improvements at the M25 junction 25

The table below / overleaf summarises the interventions in this package.

A414 Package 28 – Broxbourne Road Improvements		
Name	**Short Description**	**Estimated Cost**
Broxbourne Station access improvements	Junction improvements on Station Road to improve access/egress into Broxbourne Station.	£150k
Dinant Link Road/Essex Road roundabout improvements	Signalised crossing on western arm of Dinant Link Road / Essex Road roundabout.	£50k
Dinant Link Road/Amwell Street junction improvements	At grade signalised crossing of Dinant Link Road at junction with Amwell Street.	£50k
Lord Street widened footway	Treatment of Lord Street to widen footway and remove conflicts with parked cars along its length	£100k
College Road / A10 junction improvements	At grade improvement at College Road / A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns.	£1m

continued overleaf

Segment 13: Broxbourne

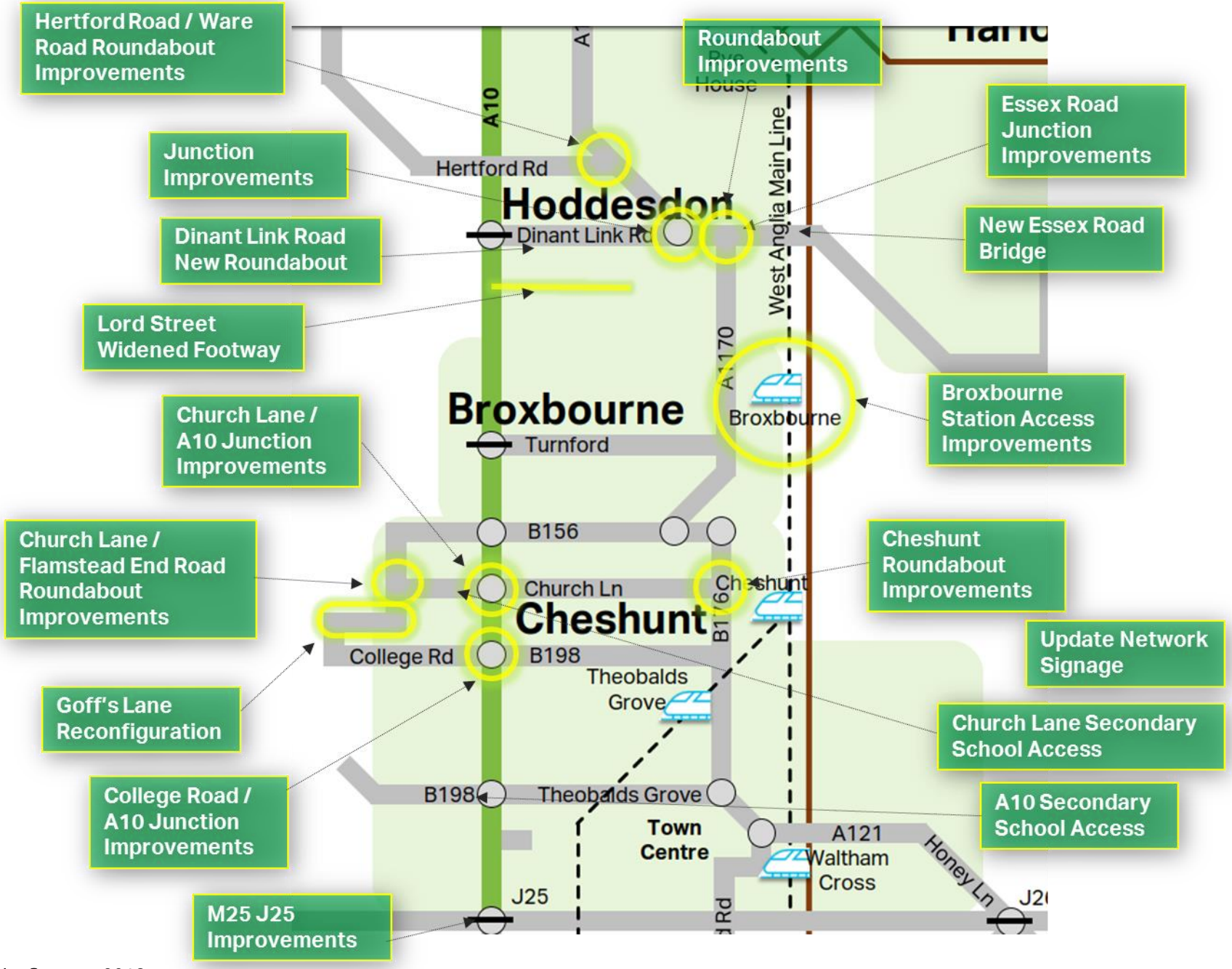
A414 Package 28 (continued)		
Name	**Short Description**	**Estimated Cost**
Church Lane / A10 junction improvements	At grade highway capacity improvement at Church Lane / A10 junction, providing an additional north-south lane through the junction and banning all right turns and left turns onto the A10.	£1m
Church Lane/High Street Cheshunt roundabout improvements	Reconfiguration of Church Lane / High Street, Cheshunt roundabout to provide signalised junction and crossing points for pedestrians.	£300k
Church Lane / Flamstead End Road roundabout improvements	Reconfiguration of Church Lane / Flamstead End Road roundabout to provide signalised junction and crossing points for pedestrians.	£250k
Goffs Lane Reconfiguration	Reconfiguration of Newgatestreet Road / Cuffley Hill / Goffs Lane junction give way to provide signalised junction with crossing points for pedestrians.	£250k
Hertford Road/Ware Road roundabout improvements	Hertford Road / Ware Road roundabout improvements to provide additional eastbound and southbound lanes at respective arms of the junction.	£150k
Essex Road junction improvements	Improvements to roundabout at junction with Dinant Link Road.	£100k
M25 junction 25 improvements	Capacity improvement at M25 J25, through the provision of a dedicated left turn lane for northbound traffic off the M25 and the widening of the A10 southbound on its approach to the junction.	£26.9m
New roundabout on Dinant Link Road	New roundabout on Dinant Link Road to permit access into High Leigh development.	£3m
Dinant Link Road/Ware Road roundabout improvements	Sun roundabout improvements (junction of Dinant Link Road and Ware Road) to provide additional lane on eastbound arm of roundabout.	£150k
New Essex Road Bridge	Provision of new Essex Road Bridge.	£6.5m
Update network signage	Update the network signage across the Borough to reflect the new access arrangements on/off the A10 at Church Lane.	£100k
New A10 secondary school access	Provision of a new access into the secondary school site from the A10 spur road to the south.	£580k
New Church Lane secondary school access	Provision of a new access into the secondary school site from Church Lane to the north.	£250k

Segment 13: Broxbourne

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 28	TOTAL INDICATIVE COST ESTIMATE	£41m

Segment 13: Broxbourne Package 28 - summary map



Segment 13: Broxbourne

Packages Overview

Package 29 – Enhancement for pedestrians and cyclists across Broxbourne

(The interventions in this package and their estimated costs are identified in the adopted Broxbourne Transport Strategy)

The overarching aim of Package 27 is:

Provide enhanced connectivity for pedestrians and cyclists making local journeys within the Broxbourne towns through the provision of new/improved, attractive walking and cycling routes.

The Package consists of:

- Improvements along the A1170 (old A10) including widened footways and a review of speed limits
- Cycle network improvements across Broxbourne
- Cycle parking provision

The table below / overleaf summarises the interventions in this package.

A414 Package 29 - Broxbourne - enhancement for pedestrians and cyclists		
Name	**Short Description**	**Estimated Cost**
Charlton Way footpath improvements	Footpath along western side of Charlton Way between Haslewood Avenue and Dinant Link Road.	£25k
Old Pond Junction Improvements	Reconfiguration of Old Pond junction to provide signalised junction and crossing points for pedestrians.	£3m
Broxbourne cycle network improvements	Improve facilities on the existing cycle network and provide new routes to create a more connected and coherent network.	£8.1m
Broxbourne signage upgrades	Provide appropriate signage across the cycle network	£100k
Broxbourne routing improvements (use of the old A10 for walking/cycling)	Introduce measures to encourage more walking and cycling along the old A10 including raised tables, widening of footways, and a review of speed limits.	£1m

continued overleaf

Segment 13: Broxbourne

A414 Package 29 (continued)		
Name	**Short Description**	**Estimated Cost**
Broxbourne crossing improvements	Provide dropped kerbs with tactile paving at all pedestrian crossing points within the Borough	£250k
Level crossing closures	Level crossing closures at Trinty Lane, Windmill Lane and Slipe Lane.	£750k
Provision of cycle parking	Provide significant increases in the volume of cycle parking at key trip generators within Broxbourne.	£50k

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 29	**TOTAL INDICATIVE COST ESTIMATE**	**£13m**

More detailed information including maps showing the locations of the intervention in Package 29 is contained in the adopted Broxbourne Transport Strategy

Segment 13 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

The Broxbourne Transport Strategy and associated documents set out a clear and comprehensive vision for addressing transport connectivity and travel behaviours across the Broxbourne area. Many of the proposals have been absorbed into the Corridor Strategy.

The Broxbourne towns have a strong relationship with Greater London. The outer London Borough of Enfield is situated immediately to the south of the M25 and within a short distance of Waltham Cross. This strong relationship is built upon the range of transport links which are on offer, including the A10, the West Anglia Main Line and Southbury branch line via Theobalds Grove.

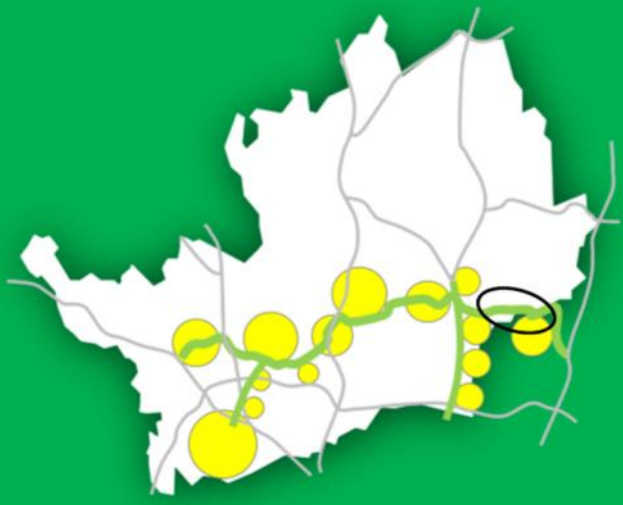
There are emerging aspirations for additional railway stations in the area, which combined with improved pedestrian and cycle routes could make a significant difference to travel choices and patterns within the area. There is also the longer term prospect of Crossrail 2 which will be a new cross-London rail service between Broxbourne and areas south-west of the capital. This could be transformative in terms of overall transport connectivity within Broxbourne.

Improvements are proposed at key junctions along the A10 corridor to address congestion issues. It is not currently envisaged however that further capacity increases should be prioritised on the A10 and therefore the emphasis is on making the public transport offer much better within this area. Key interventions such as the MRT could help address this.

A414 Corridor Segment

14

A10-Harlow



Segment 14: A10-Harlow

Harlow lies at the eastern end of the area of focus for this corridor strategy. It is by no means the terminus for the corridor, with the A414 continuing on into Essex with links to the city of Chelmsford and to the M11 corridor connecting London, the M25, Stansted Airport and Cambridge.

The A414 is the primary route linking most of Hertfordshire with Harlow and comprises a dual carriageway. Traffic which is approaching Harlow on the A414 needs to make a right turn at the Eastwick Roundabout, pass over the River Stort and enter into Harlow. A more minor network of rural lanes also connect Harlow with the Broxbourne area.

The other primary transport link is the West Anglia Main Line, a two-track rail corridor linking London and Cambridge via the Broxbourne towns to the south-west of Harlow and Bishop's Stortford and Stansted Airport to the north of Harlow.

Significant expansion of Harlow is planned as part of the Harlow and Gilston Garden Town masterplan. A series of Garden Communities are proposed around Harlow in addition to housing development within Harlow. The planned Gilston development will eventually comprise around 16,000 new homes and will be located north of Harlow and the A414. Ensuring Gilston and all of the Garden Communities are well connected with Harlow will be essential.

The A414 approaching Harlow currently experiences congestion. The town itself, a 20th Century New Town, is designed primarily around the needs of motorists. Both of the town's railway stations are located on the northern edge of the town. Harlow Town railway station will however be quite conveniently located in relation to the Gilston development.

Harlow is connected with the M11 at Junction 7. This junction and the adjoining A414 do experience peak period traffic congestion at present. A new M11 junction 7a is planned to the north-east of Harlow which will improve access by vehicle to Harlow including the Harlow Enterprise Zone, particularly from areas to the north including Stansted Airport and Cambridge.

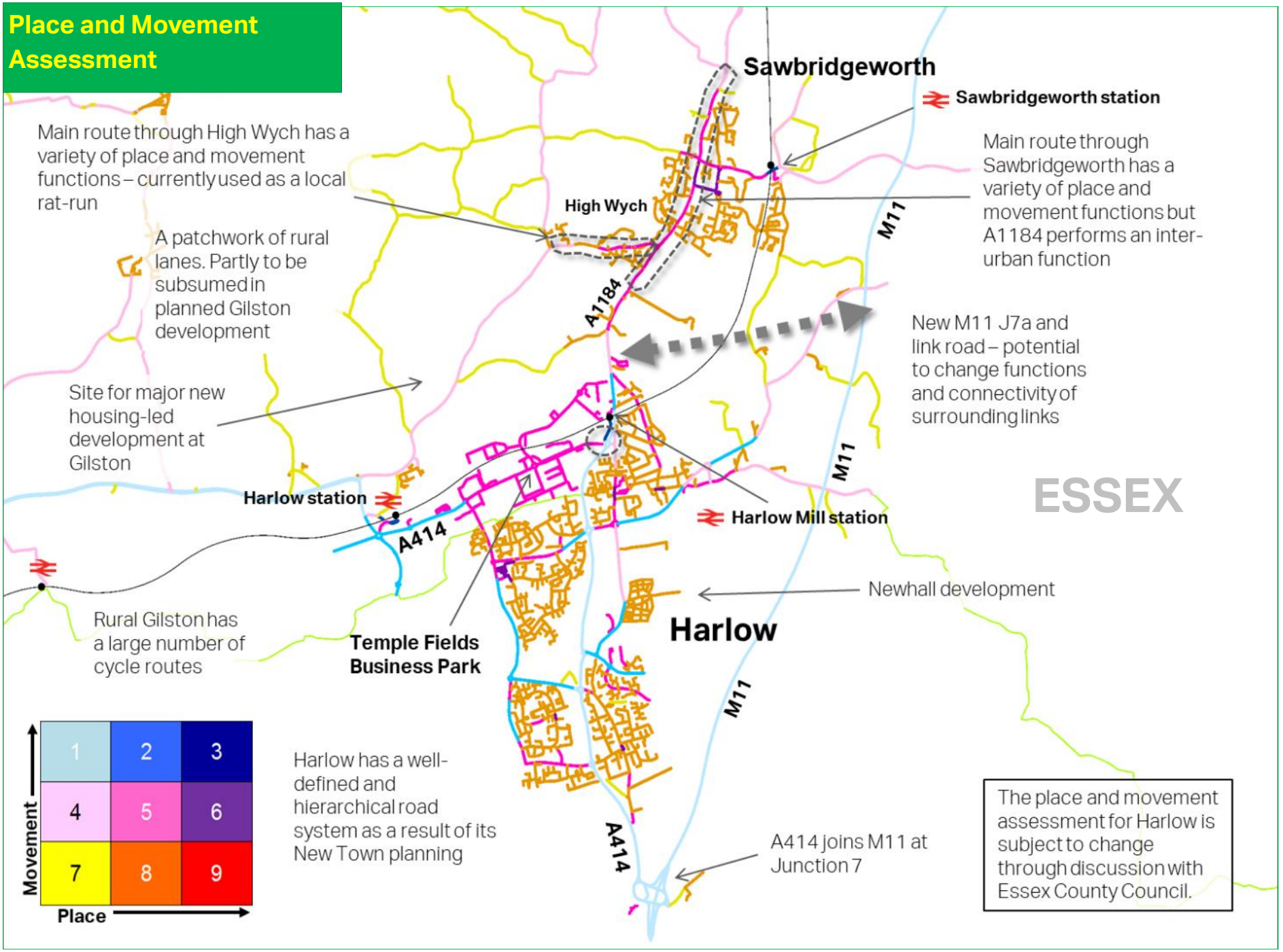
Segment 14 Summary (see Evidence Report for more detail)			
Trip Distribution	Long (>15km) 82%	Medium (5-15km) 18%	Short (0-5km) 0%
Key Infrastructure and Services	**Highway** • The A10 and Harlow are connected by the dual-carriageway A414 with a speed limit of mainly 70mph. • The B181 is a local route that connects the A10 to Harlow.		
	Public Transport • This segment between the A10 and Harlow is served by bus routes including the 424 and the 724. • West Anglia Main Line connects Harlow and Roydon to towns along the A10, as well as London and Stansted Airport.		
	Walking/Cycling • There is an off-road cycle path across the border in Essex that runs east to west (broadly parallel with the A414). This links Harlow to Roydon and towns along the A10.		
Segment Challenges	**Highway Issues** • The Eastwick roundabout north of Harlow is a congestion hotspot. This junction lies on the primary route between Harlow and the Hertfordshire section of the A414. • Two junctions are HCC defined hazardous sites.		
	Public Transport Issues • Accessibility from residential parts of Harlow to its town centre is good, however, quite limited beyond the urban boundary. • The location of the town's rail station means towns are largely inaccessible from Harlow despite direct rail connections. • PT accessibility between Harlow and Ware/Hertford is relatively low given the distance.		
	Walking/Cycling Issues • The cycling route between Roydon and Harlow is partially on-road. • As the cycle route network in Essex is not fully mapped, the quality of cycle route infrastructure in Harlow is unknown.		

Segment 14: A10-Harlow

Segment 14 Priorities

An interurban transport corridor facilitating both local and interurban journeys, with capacity increases required to meet forecast travel demand from Harlow and Gilston Garden Town

- A414 will continue to serve a strategic role in this segment providing interurban connectivity.
- Transport needs to support proposed substantial development in Gilston with various junction upgrades along the A414 including on the Eastwick roundabout and a second crossing over the River Stort.
- There will be a change to the road system in the Gilston area to ensure current network of country lanes are not adversely affected by development traffic.
- A network of Sustainable Transport Corridors will route across the Garden Town.
- A new M11 Junction 7a and link road will provide improved connectivity to the strategic road network from Harlow
- Accessibility improvements from residential areas to the train stations in Harlow are required, in the form of improved public transport and active mode travel.


Place and Movement Assessment
Sawbridgeworth
Sawbridgeworth station
Main route through High Wych has a variety of place and movement functions – currently used as a local rat-run
High Wych
A patchwork of rural lanes. Partly to be subsumed in planned Gilston development
Main route through Sawbridgeworth has a variety of place and movement functions but A1184 performs an inter-urban function
A1184
M11
New M11 J7a and link road – potential to change functions and connectivity of surrounding links
Site for major new housing-led development at Gilston
Harlow station
A414
Harlow Mill station
ESSEX
Newhall development
Rural Gilston has a large number of cycle routes
Temple Fields Business Park
Harlow
M11
Movement
Place
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Harlow has a well-defined and hierarchical road system as a result of its New Town planning
A414
A414 joins M11 at Junction 7
The place and movement assessment for Harlow is subject to change through discussion with Essex County Council.

Segment 14: A10 - Harlow

Packages Overview

Package 30 - Harlow and Gilston Garden Town Transport Improvements

The overarching aim of Package 30 is:

To provide a package of multi-modal transport improvements and brand new facilities to help facilitate large-scale sustainable development in and around Harlow.

The Package consists of:

- A second River Stort crossing.
- A reprioritised network of Sustainable Transport Corridors with a step-change in active mode and public transport infrastructure and service provision.

The table below / overleaf summarises the interventions in this package.

A414 Package 30 - Harlow and Gilston Transport Improvements		
Name	**Short Description**	**Estimated Cost Range**
New and improved access roads and junctions to serve Gilston north of Harlow (continued overleaf)	New, improved and reprioritised highway infrastructure across the Harlow and Gilston Garden Town to help facilitate planned development, including: • A414 second River Stort Crossing - a new highway bridge crossing over the River Stort to accommodate the addition trips generated by the new development at Gilston. Provision will be made for footways and off-road cycle routes. This will serve as a primary highway route into/out of Harlow. • The existing A414 River Stort Crossing (Fifth Avenue) will be widened to accommodate better public transport, footway and cycle provision providing improved access to the train station and town centre. • Gilston Sustainable Travel Hub - in conjunction with the Sustainable Transport Corridors, improvements to local bus services and potential Mass Rapid Transit services - to facilitate interchange between sustainable modes.	£50m-£100m

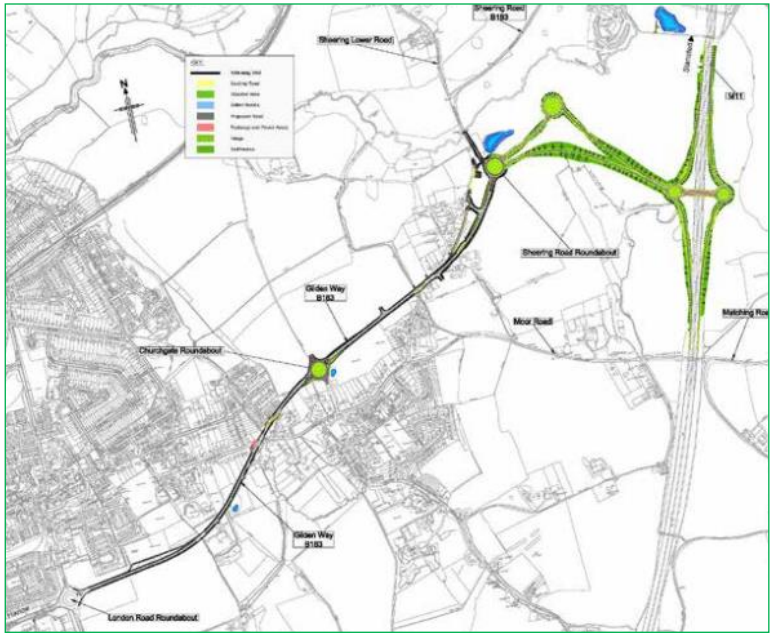
continued overleaf

A414 Package 30 - Harlow-Gilston Transport Improvements (continued)		
Name	**Short Description**	**Estimated Cost Range**
(continued) New and improved access roads and junctions to serve Gilston north of Harlow	• Sustainable Transport Corridors - These east-west and north-south corridors will provide the high quality sustainable connectivity between the existing and new communities and key destinations. They will fully integrate with a network of public and active travel mode routes, with town-wide promotion (and adoption) of active travel behaviours, which will mark the Garden Town out as a national leader in sustainable movement. • Highway road designation - consideration of potential reclassification of A414 to make use of second Stort crossing .	See previous page
Harlow A414 multiple junctions	Various A414 junction upgrades to support new development in Harlow and address traffic congestion and journey time reliability issues through the town.	£2.5m-£5m

The above interventions will complement a proposed new **Junction 7a** on the M11. The scheme is promoted by Essex County Council, in partnership with Highways England, and will provide a vital new link between Harlow and the M11. At the time of writing, Essex County Council has now published the orders required by law to go ahead with construction of the scheme. Publication of the orders starts a statutory process in accordance with relevant legislation.

Information provided on Essex County Council's website confirms the following:

The scheme begins by widening Gilden Way from the London Road roundabout to Marsh Lane to create a three-lane road. This will provide an additional lane for traffic approaching Harlow. The widening will be accommodated within the existing highway boundaries or on land that will be transferred to the highway authority's ownership. From near the junction with Marsh Lane, a new road to the east will be built to link the improved Gilden Way to the M11 via a new roundabout called The Campions roundabout. A section of the old Sheering Road as it passes The Campions will become access-only for residents, while access to Mayfield Farm will also be improved. From the new The Campions roundabout,



Source: Essex County Council

the link will continue towards the new motorway roundabout junction on the western side of the M11. This is one of two new roundabouts that will be built on either side of the M11 and connected by a new bridge over the motorway. There will be slip roads on and off the M11 for both northbound and southbound traffic. Traffic travelling from the new M11 junction toward Harlow will use the new roundabouts, on either side of the M11, and travel along a new wide two-lane link road to The Campions roundabout.

It is important to note that the scheme does not include a direct link to the A414 at Eastwick. The immediate priority for the Harlow and Gilston area is to ensure that the proposed Garden Communities including Gilston are well connected to the existing town, and that there are sufficient opportunities to facilitate sustainable travel on foot, by bike and by public transport. A new direct east-west route from the M11 at J7a to the A414 at Eastwick could work against local priorities and therefore has not been considered further as an immediate priority for investigation in the A414 Corridor Strategy.

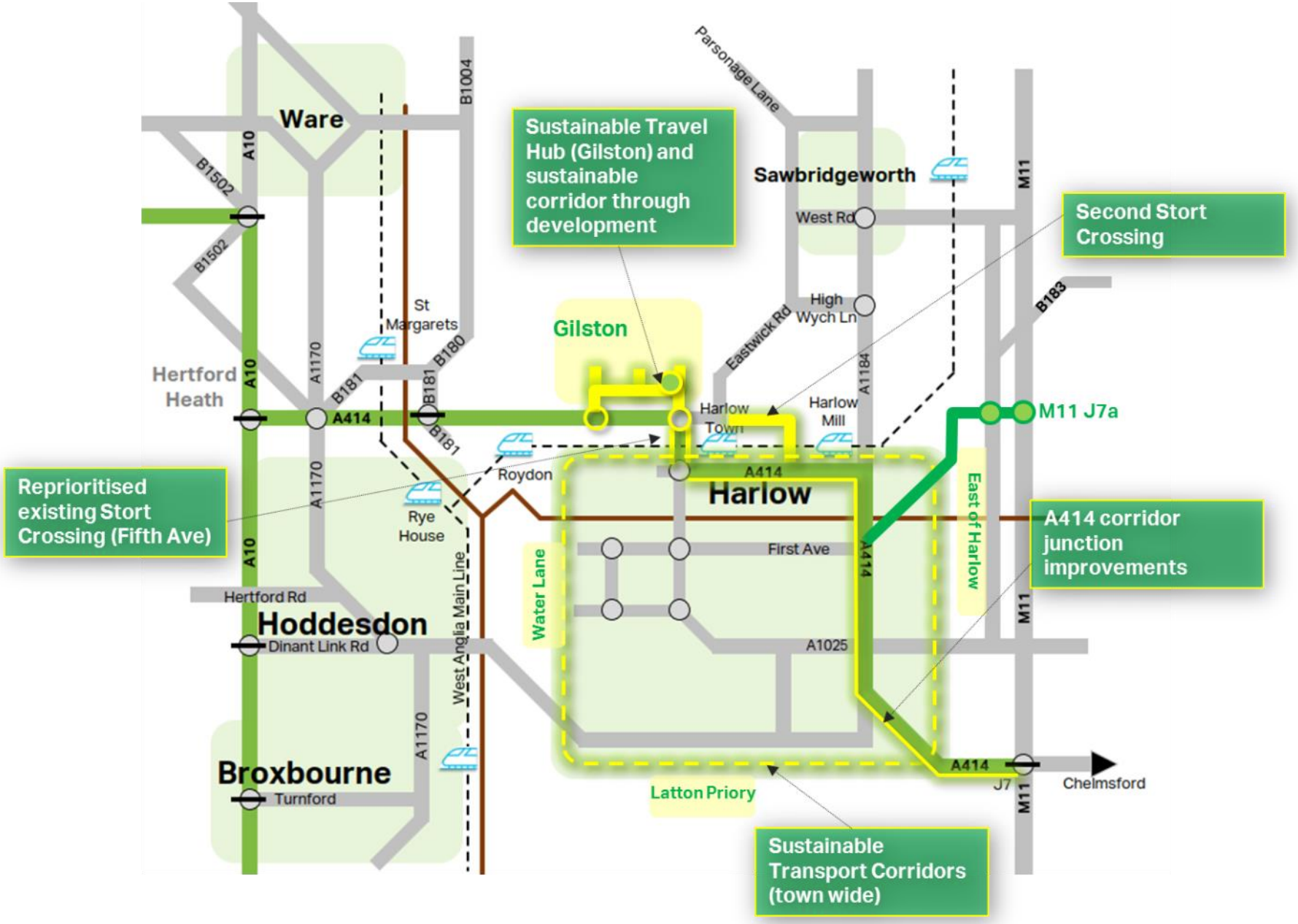
A consortium of local authorities including Hertfordshire County Council has been overseeing more detailed work to identify and prioritise infrastructure needs in the Harlow and Gilston Garden Town. A Transport Strategy for the area is emerging at the time of writing and further work will follow to consider the funding and delivery of major pieces of infrastructure including the second River Stort crossing.

The proposed interventions are likely to come forward in conjunction with development, which is tied to nearby mineral extraction sites.

The following table presents an indicative cost range estimate for this package. They are likely to change and be refined once more detailed work is undertaken to develop the interventions. Reference should be made to the A414 Corridor Strategy Implementation Plan for up to date information.

PK 30	TOTAL INDICATIVE COST RANGE ESTIMATE	£53m - £105m

Package 30 - summary map



Segment 14 - Looking Ahead

The A414 Corridor Strategy has drawn on a wide range of adopted and emerging Transport Strategies and Plans, as well as optioneering, to develop a list of relevant interventions by segment. Additional interventions could therefore be explored or more broader principles could be adopted at a later point which could build upon the proposals in this segment.

Harlow will be expanding significantly as part of the overarching Harlow and Gilston Garden Town proposal. There are emerging proposals to address the transport challenges which are likely to materialise as a consequence of a significant growth in population which are reflected in the A414 Corridor Strategy.

As referenced elsewhere in the Corridor Strategy, the Mass Rapid Transit has the prospect of being a core feature of a future, innovative and sustainable transport offer in Harlow. As the focus of the Corridor Strategy has been primarily on addressing the current and future east-west growth and transport priorities of Hertfordshire, cross-boundary linkages to Essex are also important. A Mass Rapid Transit could extend northwards to Stansted Airport, and potentially further into Essex.

There are emerging proposals to relocate the Princess Alexandra hospital in Harlow from its more central location to the north-west of the town centre to either a site within the Gilston development area or a location on the north-eastern side of Harlow.

Hospitals can have large catchment areas, with both employees and patients travelling in from a much wider area than the immediate town.

A relocated hospital will create new demands in terms of local and more strategic transport links. For shorter distance trips, good access on foot, by bike and by local bus will be essential. The planned sustainable travel corridors across Harlow should help facilitate cross-town trips to and from the relocated hospital. Effective management of parking will also be an important consideration.

For trips to/from outside of Harlow, there will need to be attractive public transport links. Many existing services including rail services on the West Anglia Main Line will fulfil this need, but existing local bus services may need to be re-routed, additional services provided (potential demand responsive bus services) and the Mass Rapid Transit may also need to link to the hospital, especially if the catchment area extends to places like Hertford and Ware.

Annex

15

Mass Rapid Transit - Vision and Options

Introduction

Annex 15 sets out a high level vision and potential options for a Mass Rapid Transit system across Hertfordshire. This builds upon the following set out in Hertfordshire County Council's Local Transport Plan 4 (page 105):

A passenger transport link offering greater speeds and reliability than traditional bus services, linking Hemel Hempstead Rail Station in the west to Welwyn Garden City in the east, with potential future extensions to Hertford and Harlow.

The service would be expected to operate relatively free from the impacts of traffic congestion using bus priority measures and segregation.

The scheme seeks to remedy some of the current east west connectivity deficiencies in the county and enhance interurban connectivity. The scheme could potentially serve park and ride sites on the edges of the towns it serves. The scheme is highly flexible and could be brought forward in stages or evolved from gradual bus priority enhancements on its route. This enhances its deliverability and alignment with bus improvements that could come forward in the short and medium term. It can be delivered at much lower cost than rail or light rail alternatives, and importantly offers greater flexibility on the destinations it serves in the future which could change depending on long term land use plans.

Passenger transport vehicles could develop considerably in the next 15 years, potentially being early adopters of fully autonomous technology, which could significantly reduce their operating costs. Other developments such as with regard to fuel, engine technology and ticketing systems could result in more 'train like' levels of service, challenging existing perceptions of bus and rail comparisons.

Connectivity to St Albans could be provided by bus or via an interchange with the Abbey Line but this will need to be assessed as part of the consideration of long term options in the Watford-St Albans corridor.

The scheme could serve, and its delivery be supported by, development and increased development density along its route, this should therefore be a consideration in further development of local land use plans.

The remainder of this annex considers the overarching aim of a Mass Rapid Transit; why it is needed; the general concept of a Mass Rapid Transit and the criteria it would need to meet; the overarching connectivity strategy; potential transport technology options;; and alternatives to a Mass Rapid Transit. More detailed work is currently underway to determine the preferred option for a Mass Rapid Transit system across Hertfordshire.

Overarching aim of a Mass Rapid Transit in Hertfordshire

The overarching aim of a Mass Rapid Transit in Hertfordshire is set out below. It is important to define an overarching aim to build consensus around what a Mass Rapid Transit system is intended to be. It can also be used to influence the development of the scheme and develop a more detailed set of objectives and outcomes as part of more detailed work at a later stage.

A fast and reliable, express inter-urban passenger transport network linking major urban settlements within the A414 corridor to facilitate sustainable travel and address the pressure of delivering significant growth in housing and jobs.

Why is MRT needed?

- Aside from the existing Greenline 724 bus service which runs between Harlow and Watford, there are **no direct public transport services** east-west across Hertfordshire
- Existing public transport **journey times are long** across the corridor
- There is **expected growth** in housing and employment across the county which will generate new cross-county journeys
- Investment in high quality public transport has the potential to **reduce congestion** on the A414 by encouraging modal shift
- It will also improve Hertfordshire's image by providing a sustainable form of mass transit for east-west inter-urban trips

76% of commuting trips to towns on the A414 Corridor are made by car

... but only **5%** of these are made by bus

In the majority of the A414 Corridor less than **35%** of employees live and work in the same town but this could change in the future

The current journey time between Hemel Hempstead and Welwyn Garden City on the 300/301 bus is **75** minutes compared to **30** minutes by car

Journey Times	Greenline 724 (timetabled)	Car (estimated)
Watford - Hatfield	60 mins	30 mins
Hatfield - Harlow	70 mins	30 mins
Hertford - Harlow	25 mins	20 mins

Why a Mass Rapid Transit in Hertfordshire is needed

- The A414 corridor already experiences significant traffic congestion and poor journey time reliability today. With the estimated level of growth, traffic issues are predicted to persist and intensify in the future on the A414 and also on adjoining and parallel routes.
- A series of highway and junction improvements are put forward in the A414 Corridor Strategy, including M1 Junction 8 and A414/A1081 London Colney Roundabout. These are not intended to eradicate congestion. At the very most they may only be expected to manage future levels of traffic congestion so they are no worse than they are today.
- Continuing to build additional highway infrastructure to a level which can accommodate all traffic and significantly reduce congestion both now and to maintain this improved level of service over a long period is not considered affordable or sustainable. A more efficient way of using existing infrastructure therefore needs to be found.
- Evidence in the strategy has identified that the A414 is used by a variety of trips, including shorter distance trips within towns but also trips between towns along the A414 Corridor. The private car is the default travel mode choice for many people for a variety of reasons. The absence of an attractive, direct, frequent and high quality public transport service running east-west across Hertfordshire is likely to be a factor in people's mode choice.
- Passenger transport services including buses can be a more space efficient way of transport people using existing infrastructure. Many of the car journeys occurring along the A414, especially during weekday peak periods, involve people driving alone, for example to/from work. A single decker bus has the potential to carry up to 75 passengers however a bus would occupy the space of around 2 cars carrying potentially only 2 drivers on the road.
- If all of the 50,000 estimated new homes in the corridor area generated just one additional car on the A414, and if all the cars lined up in a queue, the queue could stretch around 290km in length. That is almost six times the length of the A414. Many new households will have access to more than one car.
- If the A414 becomes a less attractive route in the future because of traffic congestion, motorists with no mode alternative will continue to drive, seeking out alternative and less appropriate routes such as along country lanes and through residential areas.

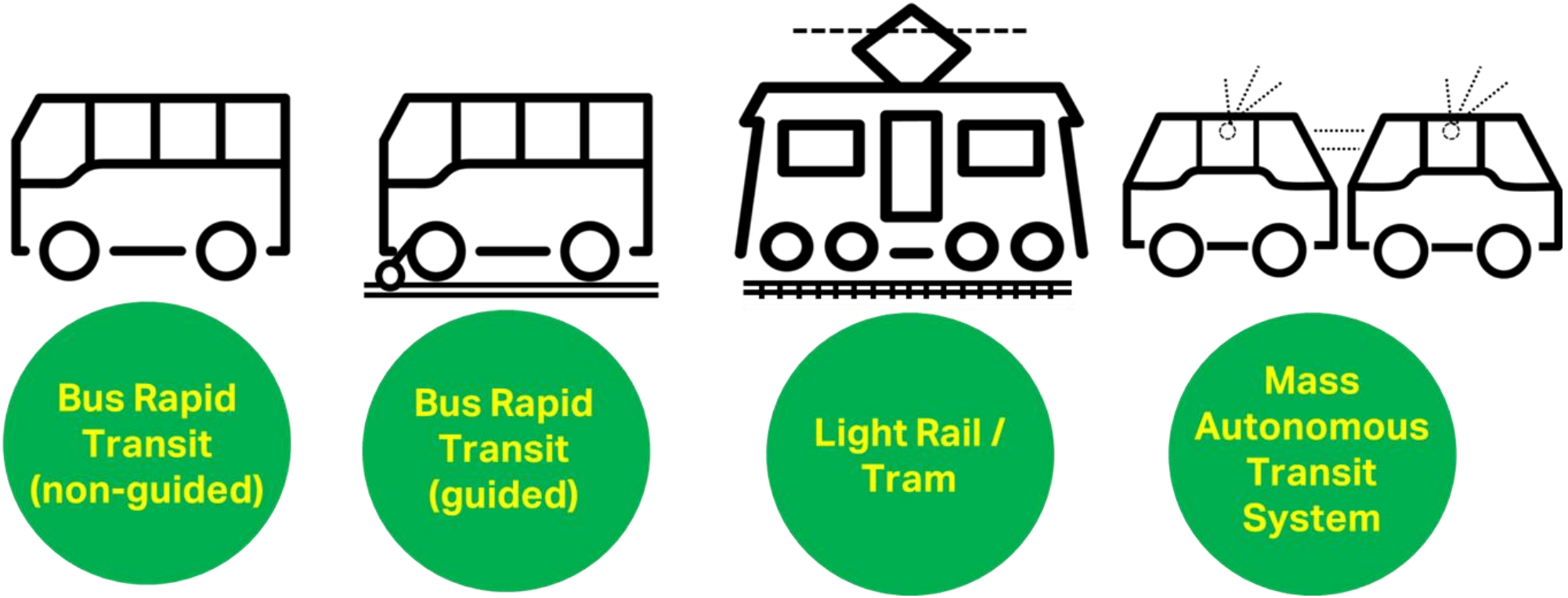
General concept and criteria for a Mass Rapid Transit in Hertfordshire

- **1** | Ability to interchange easily between different modes of travel
- **2** | Frequent services to minimise wait times
- **3** | Reliable services
- **4** | Distinctive branding and marketing
- **5** | Integrated ticketing
- **6** | High quality waiting facilities
- **7** | Better-than or equal-to journey times compared to the private car
- **8** | Dedicated Infrastructure – minimise mixing with general traffic
- **9** | Linked to major transport hubs
- **10** | Linked to key developments and major employment centres
- **11** | Supporting sustainable growth

Transportation Options

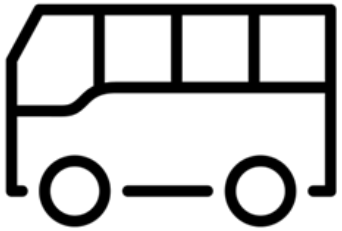
There are a wide variety of potential transport technology options which could be adopted for a Mass Rapid Transit. For simplicity, the following have been considered at this stage.

Other options (or hybrids of options) could be also considered which are not captured in this report including automatic light vehicles, ultra light rail and affordable very rapid transit. More detailed work is currently being undertaken to determine the preferred option for the MRT.

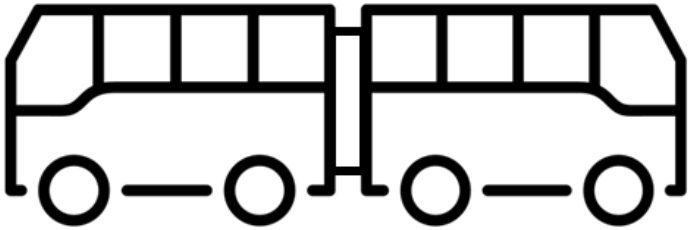


Capacities

The passenger loading capacity of different transport options is presented below. This includes passenger seating and standing capacity. Passenger capacity could be a key factor in future decision making in terms of how to transport as many people in an efficient and cost effective way.



Single decker bus typical capacity: 60-75



Double decker or articulated bus typical capacity: 90-105

Tram typical capacity: 100-210

Bus Rapid Transit (Non Guided)

- Bus rapid transit provides faster, more reliable journeys by giving buses priority
- Uses a mix of segregated bus lanes, standard bus lanes and bus priority traffic signals
- Bus rapid transit integrates well with other forms of transport

- It needs to be accompanied by a distinct marketing and branding campaign
- To help differentiate it from more traditional forms of local buses, a BRT system needs to be accompanied by improved waiting facilities including shelters and real time information screens
- Shorter journey times / improved journey time reliability makes it a viable alternative to the car

Bus Rapid Transit (Non Guided)

Advantages

- Cheaper than light rail and guided bus
- Penetration of town centres utilising existing roads (with bus priority technology)
- Easier to retrofit to modern/automated technology
- Potential to fund through S106 contributions, growth deals and other funding arrangements
- More reliable and faster journey times than ordinary bus services
- Adaptable routes which could not happen with light rail
- Higher value for money
- More flexible service routings than guided bus and light rail
- Vehicles can be upgraded (potential to switch to electric-powered and autonomous or semi-autonomous technology)
- Could be delivered and operational within a shorter timescale than some alternatives

Disadvantages

- Bus priority technology is not always as efficient as envisaged
- Faster speeds and reduced journey times could be achieved with a guided busway
- May not be distinctive enough from ordinary buses to attract passengers – it may not represent a significant enough step-change in public transport service provision.

Bus Rapid Transit (Non Guided) Case Study

Fastrack - Kent

- First opened in 2006
- Includes signal priority, reserved lanes and dedicated busways
- Three fare zones and tickets are sold on the bus, at stops or on an app
- Links Southeastern rail network at Dartford, Bluewater shopping centre, Gravesend and Ebbsfleet international
- Core network of 40km, half of the routes operate on dedicated bus-only roads where no other services run
- 2 million passengers in the first 14 months of operation

Overview of non-Guided / Part-Guided Bus Rapid Transit

- Non-guided BRT schemes can offer higher value for money and they can have a significant impact in terms of increasing ridership levels in local areas
- They can make existing routes and corridor seem more attractive for bus travel
- Routes can be modified more easily than alternative options such as guided busways—this flexibility had a positive impact on the Fastway scheme in Sussex after it was initially opened.
- The business case for non guided BRT schemes can be very positive. This outcome can be achieved by having development growth clustered around transport hubs along the route.
- More reliable journey times can attract additional passengers as it creates a positive image.

Bus Rapid Transit (Guided)

- Guided BRT comprises of segregated carriageways for buses
- Stops, with platforms akin to a railway line, are found along the segregated busways, with links into urban centres
- Carriageways are designed so cars are unable to use the route
- Footways/cyclepaths can run alongside the busway – crossings do not need to be grade-separated

- Journey times are faster because buses are fully separate from other traffic and therefore are able to achieve higher speeds
- Suitable for tighter alignments where it would not be feasible for buses to reach high speeds safely
- Higher quality of buses which have to be specifically designed

Bus Rapid Transit (Guided)

Advantages

- Cheaper than light rail
- Potentially easier to retrofit to modern/automated technology than light rail
- More reliable journey times (more limited mixing with general traffic)
- Journey times faster with guided busway bypassing areas of congestion
- Does not need the same level of patronage as light rail
- Better image than ordinary buses – can present itself as a step-change in public transport service provision
- Vehicles can be upgraded (potential to switch to electric-powered and autonomous or semi-autonomous technology)

Disadvantages

- Many UK examples of inter-urban guided busways follow former railway alignments
- Bus priority technology is not always as efficient as envisaged
- May not have a modern attractive image compared to light rail
- Higher costs than non guided bus rapid transit – construction of guideway can be costly and requires on-going maintenance
- Inflexibility – one guided bus cannot over take another

Bus Rapid Transit (Guided) – Case Studies

Cambridge-St Ives Guided Busway

- Began operation in 2011
- Longest guided busway in the world, two guided sections make up 16 miles of the route
- Built along two disused railways
- Passengers are required to purchase tickets before boarding
- Cyclepath/bridleway alongside some sections of the route
- 2.5 million trips taken in first year of operation

Luton-Dunstable Guided Busway

- Opened in September 2013
- Built on the route of a disused railway
- 8.3 miles in length, of which 4.8 miles is guided track with a maximum speed of 50mph
- Connects Dunstable, Houghton Regis and Luton (with Luton Airport)
- Three years to construct, included seven new bridges, reconstruction of three bridges, bus stops and a new transport interchange at Luton Airport
- 350,000 passenger journeys in first three months of operation

Overview of Guided Bus Rapid Transit

- Guided BRT schemes can generally offer good value for money and can outperform expectations in performance including patronage growth, journey time reliability, passenger satisfaction and reductions in general traffic on parallel routes.
- There is some potential for guided BRT schemes to be adaptable for future technology, although there is not much evidence of this in the UK.
- Guided busways may be situated further from built-up areas, especially if they are built along former transport corridors such as disused railways (such as the Cambridge Busway and Luton Dunstable Busway examples). Therefore high quality transport hubs with good local connections are really important.
- It is a higher cost option when compared against non-guided BRT schemes, but much cheaper than tram/light rail. If marketed in the most effective way, it could alter the public perceptions about buses and could achieve similar levels of benefits to a light rail system.

Light Rail/Tram

- Light Rail and Tram systems are popular due to their speed and high capacity
- Tracks can either be on street or on segregated rails (including former railway alignments)
- Popular in urban centres – less so between towns
- Typically lighter and shorter than conventional trains

- Trams are able to run through the centre of urban areas, with stops close to the final destination
- Compatible with pedestrians within town centres
- Have a good image in comparison with local buses.
- Depending on specification, can have much higher capacities than conventional buses

Light Rail / Tram

Advantages

- Higher passenger carrying capacity than buses
- Accessible and visible stops
- Penetration of urban centres with permanent, visible infrastructure
- Predictable, regular and reliable journey times and service patterns (depends on frequency of light rail/tram)
- High quality of ride throughout the entire journey
- Physical integration – often 'designed-in' (e.g. to major rail or bus station or major developments).
- Adaptable – light rail can operate in urban and suburban environments; can leave the city and run on railway tracks, even in mixed operation with heavy traffic.

Disadvantages

- High investment costs - Bus Rapid Transit could carry similar passenger numbers for a lower investment
- Requires high level of segregation and priority at junctions
- Generally lower proportion of seats to standees
- Trams may not be designed for longer distance, inter-urban journeys
- Inflexibility of route e.g. in case of breakdown or a temporary street closure due to a special event or parade
- Inflexibility of tram - one tram cannot overtake another
- Longer development time scale– between emergence of the first idea to the opening of the line (compared to non-guided bus rapid transit, and potentially guided bus rapid transit)

Light Rail/Tram – Case Studies

Croydon Tramlink

- Operation commenced in 2000
- 39 stops along 17 miles of track, a mixture of street track shared with other traffic, dedicated track on roads and off-street
- Tickets are available either on PAYG or paper tickets, and include London Travelcards
- All stops have disabled access, Passenger Information Display, a ticket machine, and most have seats/shelters
- 27 million passenger journeys in 2015/2016

Midland Metro

- First section opened in 1999
- Operates between Birmingham Wolverhampton, on street in urban areas and on rail tracks between the cities
- 13 miles in length with a top speed of 43.5mph
- There is a smart-card system in place, but paper tickets can also be bought. Fares are distance related
- Around 6 million passengers use the Metro a year

Overview of Light Rail / Tram

- Light rail transit (LRT) or trams can be the public transport backbone of medium to large-scale cities and can also serve as a feeder to other forms of transport in larger urban conurbations such as heavy rail
- Successful LRT/tram schemes have stops which are integrated with other forms of public transport, near interchanges and park and ride sites
- The system can be multifunctional, operating both underground and at surface level, within street environments and on segregated alignments
- It is considered to be a good intermediate transport mode for capacity needs which range between 3,000 and 11,000 passengers per hour, per direction.

Autonomous Mass Transit Corridor

- The form this will take is still emerging as this is a new technology
- Autonomous vehicles require no driver and use sensors to detect their environment
- Passengers are free to spend travel time as they wish
- Currently this is only being tested on a small scale, however there is the potential for mass autonomous transit
- This option could be an evolution of an existing mode as opposed to an entirely new, replacement mode of travel

It is not possible at this stage to identify advantages or disadvantages of an autonomous mass transit as there is a great deal of uncertainty around what this could entail and few or no examples of a mass autonomous network.

Autonomous Mass Transit – Emerging Examples

There are some emerging examples of smaller-scale autonomous transit systems.

Sion Driverless Bus (Switzerland)

- Began operating in December 2015
- Carries 11 passengers along 1.5km route through the Old Town
- 60,000 passengers in the first 2 years
- Maximum speed of 45 km/h but are currently restricted to 20 km/h
- Currently plans to expand the service and test the shuttles in heavier traffic and traffic lights

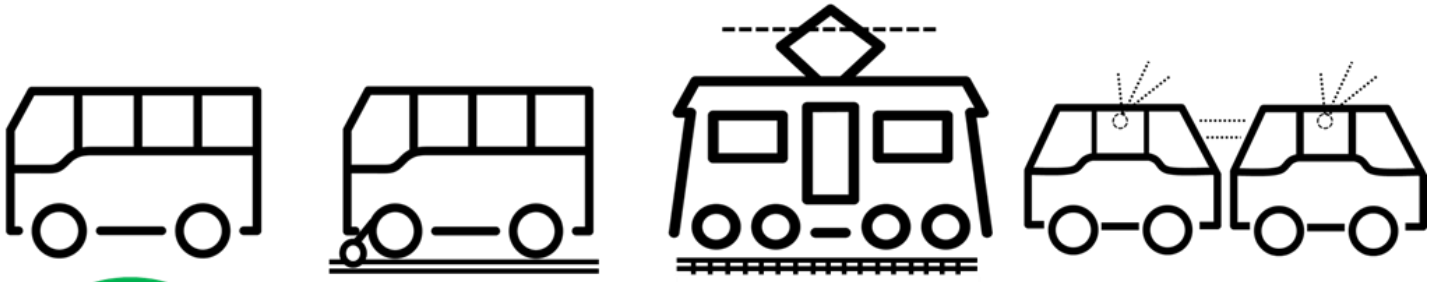
Roaming – Easymile

- Autonomous electric bus which seats up to 8 passengers, or 7 with a wheelchair
- Used to meet first mile/last mile requirements of a trip
- Used in Gelderland county in the Netherlands between Ede-Wageningen railway/bus station and Wageningen University and Research Centre, called 'WEpod'

Autonomous Mass Transit—overview

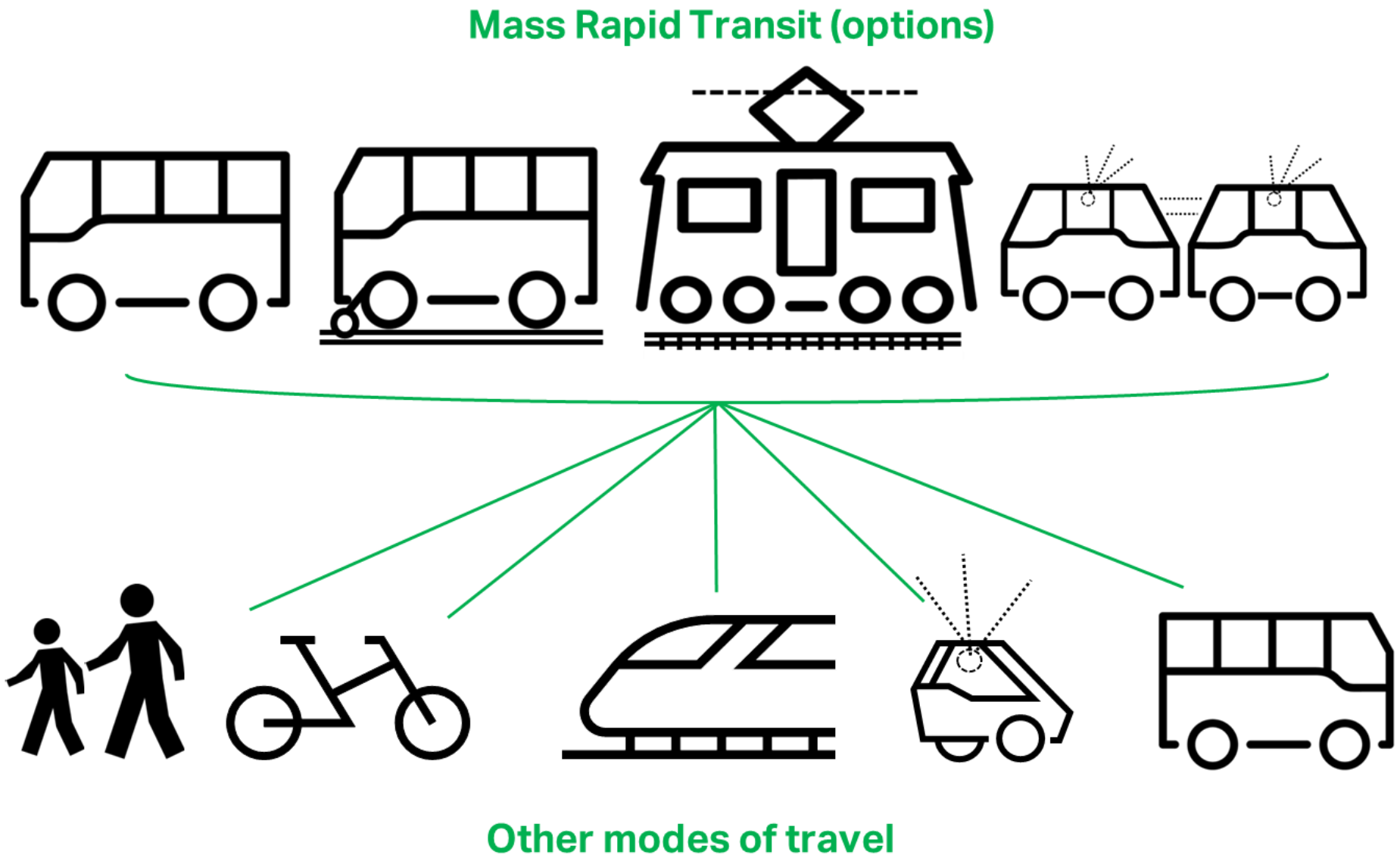
- Autonomous vehicle use is one of the dramatic possibilities for the future of transport. It could profoundly affect both private and public forms of transport
- Research is progressing in this field with many trials for small-scale autonomous transit underway. Pilot studies for mass autonomous transit are yet to take place in the UK.
- There is a significant amount of central government funding which has been made available to support the development of autonomous transport
- Consideration may need to be given to how current or emerging mass transit links will need to be adapted to accommodate autonomous vehicle technology in the future.

Comparison of costs



	Bus Rapid Transit (non-guided)	Bus Rapid Transit (guided)	Light Rail / Tram	Mass Autonomous Transit System
Indicative capital cost per km	£1.65m	£6.75m	£11.25m	£?
Indicative operating cost per route km pa	£60,000	£60,000	£200,000	£?
Potential Benefits to Cost Ratio	2 – 2.5	1 – 1.5	<1	?
Potential delivery timescale	2 – 5 years	3+ years	5+ years	?

The MRT will need to form part of an integrated system of sustainable transport services and routes, facilitated by integrated ticketing, shared digital services and platforms, joined up infrastructure to facilitate seamless interchange, and co-ordinated timetabling.



Preferred Option

More detailed work is currently underway to determine the preferred option for a Mass Rapid Transit system in Hertfordshire.

Abbey Line

The position of Hertfordshire County Council is that it supports the continued use of the Abbey Line as a heavy rail operation whilst seeking improvements which would increase service frequencies.

Alternatives to a Mass Rapid Transit

There is currently very limited end-to-end public transport services within the corridor. An hourly bus service operates between Watford and Harlow but journey times are much longer than those of the car. Passengers are therefore required to make at least one change of bus or train. A journey by train would most likely require a passenger to travel via London.

The evidence reviewed as part of this Corridor Strategy has determined that a mixture of trip types occur along the corridor. Some trips are shorter distance and occur between adjacent towns. Other trips occur over a longer distance, whilst end-to-end travel for instance between Hemel Hempstead and Harlow is less common.

The corridor is heavily car-focused at present and experiences significant weekday peak period traffic congestion along certain links (including the A414 in Hemel Hempstead and Hertford) and at many key junctions (including A1(M) Junction 4 and the A414/A1081 London Colney Roundabout). The strategy has proposed a selection of highway interventions and junction enhancements, however traffic modelling has indicated that whilst these interventions will provide some relief to congestion they are not expected to solve congestion entirely in the longer term.

In line with the objectives and policies of HCC's Local Transport Plan 4 and the adopted and emerging Local Plans in the area, this corridor strategy has determined that it would not be appropriate or sustainable to continue catering for car trips by providing additional highway improvements over and above the selection proposed. Additional highway interventions could take the form of brand new highway links, the widening of existing carriageway to three or more lanes and the replacement at-grade roundabout and signal-controlled junctions with grade-separated junctions akin to those of a high-speed motorway. Whilst there could be a shorter term benefit in terms of cutting down journey times and reducing queues, the additional highway capacity provided could in due course be occupied by additional traffic which is attracted to use the A414 as a result of the improvements made. Furthermore, the A414 already performs the function of an alternative to the M25 especially when major incidents occur on the motorway, therefore providing a high capacity, high-speed highway corridor would not be in the interest of Hertfordshire and catering for more local journeys which are occurring within the county.

One of the underlying reasons for the corridor's traffic congestion issues is a lack of attractive and viable alternatives which forces people to use a car. There are numerous local bus services however these can be perceived as being slower and less reliable, taking circuitous routes and making multiple stops to collect passengers, and they do not link together all of the corridor's settlements.

The concept of a Mass Rapid Transit has been put forward as a viable alternative to the car for inter-urban journeys. Its overarching aim is a fast and reliable express inter-urban passenger transport network linking major urban settlements within the A414 corridor to facilitate sustainable travel; to address the pressure of delivering significant growth in housing and jobs; and to provide a step change in capacity and service provision to maintain and enhance Hertfordshire's local economy and competitiveness.

A MRT could take different forms. This Corridor Strategy has considered different options at a high level. For example, it could take the form of a dedicated bus-fleet running on existing roads or using some dedicated bus lanes and priority traffic signals; or it could run along its own dedicated guided busway; or it could take the form of a tram system running along its own track system largely segregated from existing roads. At this stage, there is no preferred option being put forward. More detailed work is currently being undertaken to assess the different options.

A public transport alternative to a MRT which has been dismissed on the basis of likely cost and value-for-money is a heavy-rail based system. This east-west rail corridor would need to link together the various north-south radial rail corridors feeding into London from the West Coast Main Line in the west and the West Anglia Main Line in the east. There have in the past been various railway branch lines that criss-crossed parts of the corridor however many of these closed between the 1950s and 1970s, including routes between Hemel Hempstead and Harpenden, St Albans and Hatfield, Welwyn Garden City and Hertford, and between Hertford North and Hertford East stations.

Parts of these former rail lines have since been built on or they now function as attractive leisure routes including parts of the National Cycle Route Network. These railways mostly operated separately so it would not have been possible for a passenger to have made a journey by rail for instance between Hemel Hempstead and Hertford without making at least one change.

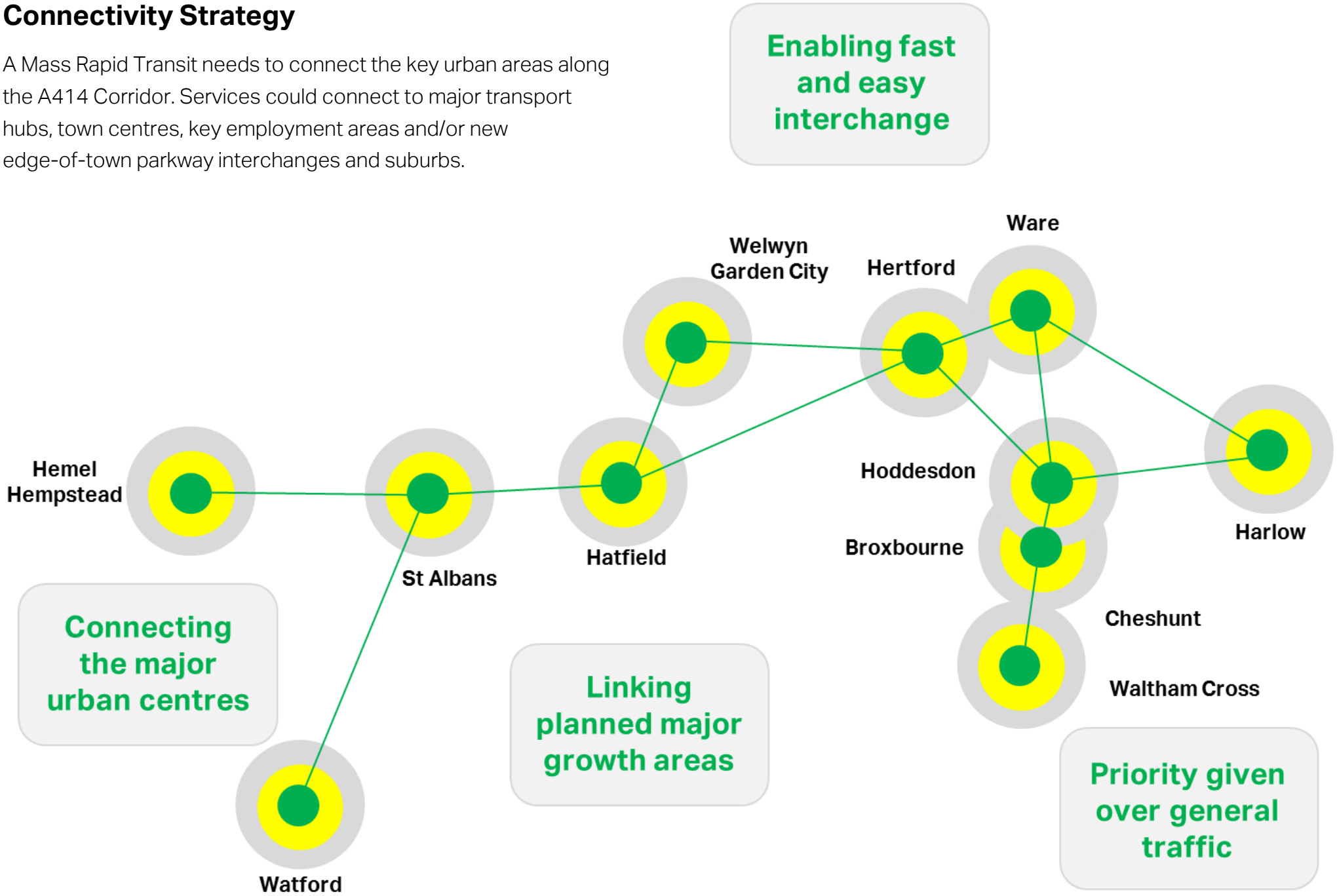
Furthermore, many of these former railways comprises a single track. It is considered that to provide a fast, inter-urban heavy-rail based service, two tracks would be required at least on parts of the route to enable two trains to pass. Any re-opening of these former rail corridors would most likely require significant engineering and land purchase.

Sections of the north-south main line railways would need some form of upgrade as would stations to accommodate additional tracks and/or platforms. The existing cycle tracks would need to be diverted onto new routes elsewhere or space provided alongside the tracks to accommodate the cycle tracks.

A further alternative would be to develop an entirely new rail alignment however this would be extremely costly and unlikely to reach the centres of urban settlements without very significant land purchase, demolition of existing buildings and the construction of bridges and tunnels.

Connectivity Strategy

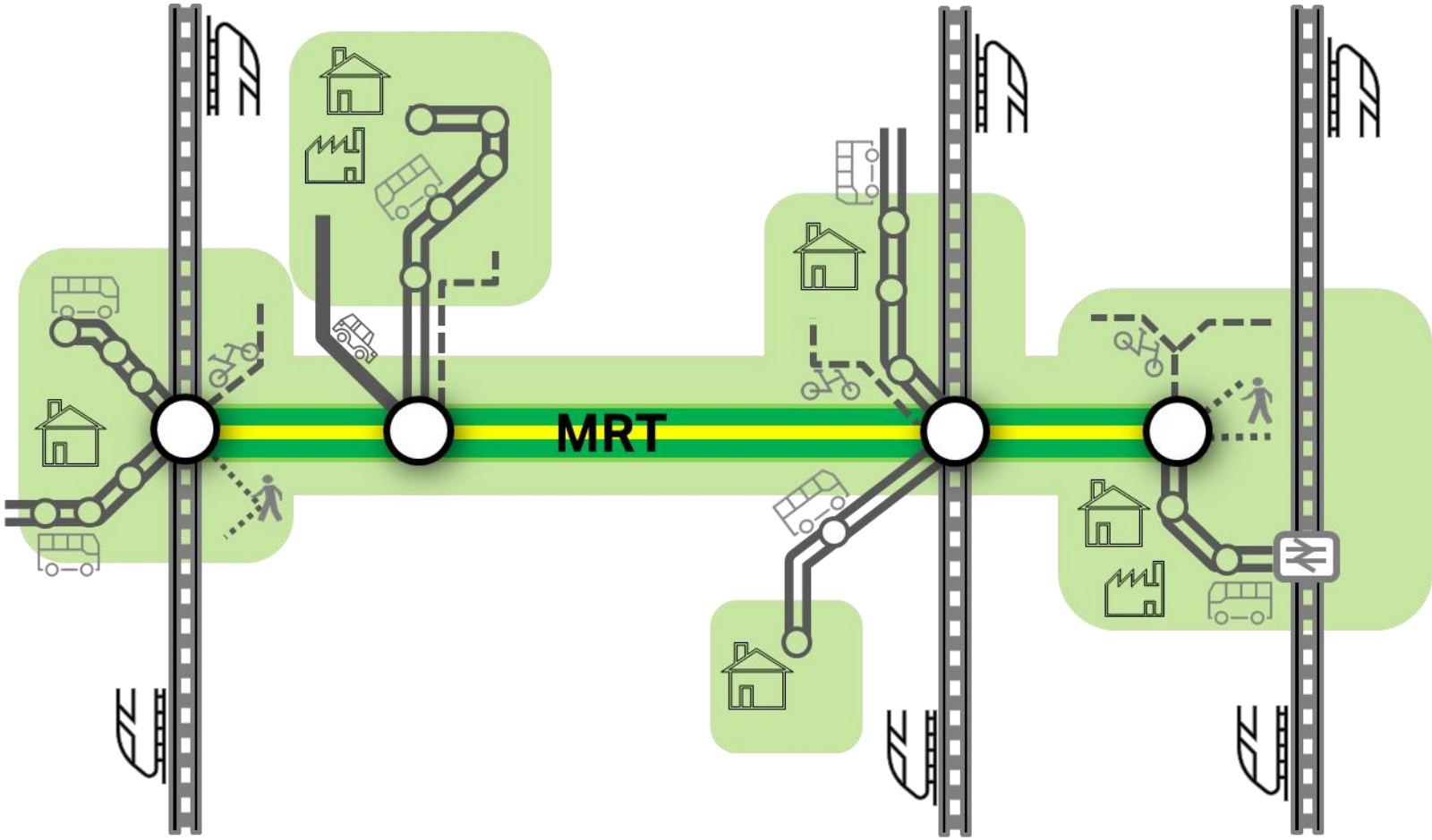
A Mass Rapid Transit needs to connect the key urban areas along the A414 Corridor. Services could connect to major transport hubs, town centres, key employment areas and/or new edge-of-town parkway interchanges and suburbs.



It will not be feasible for an MRT to connect to all places. An integrated travel network will be required for an MRT to be successful, encompassing all modes of travel—car, bicycle, walking and local bus.

Some local bus routes will be reconfigured and improved to act as feeder services to the MRT.

Walking and cycling networks will be improved to provide better local links to MRT interchanges.



Some MRT interchanges could be located at stations on major railway corridors including the West Coast Main Line and East Coast Main Line; at edge of town locations; adjacent to major employment areas (including Maylands and Hatfield Business Park); and in town centres.

MRT interchanges will be high quality, providing a range of facilities including seating, shelters, real time information, wi-fi access and cycle parking. Some interchanges could have enhanced facilities including car parking/drop-off, lockers etc.

Annex

16

Sifting and Packaging

Sifting and Packaging of Interventions

Summary of the methodology

The A414 Corridor Strategy has involved engagement with a wide range of stakeholders and reviews of existing and emerging plans and strategies to develop a long list of potential interventions.

Existing and emerging plans and strategies include the adopted Broxbourne Transport Strategy and the Hatfield Transport Strategy, the South West Hertfordshire Growth and Transport Plan and the emerging (at the time of writing) South Central Hertfordshire Growth and Transport Plan and Harlow Gilston Garden Town Transport Strategy.

In addition, a series of optioneering workshops were held with stakeholders to identify other potential intervention which could address the challenges along the corridor. Reference was also made to previous studies which had focused on particular locations including in the Maylands area of Hemel Hempstead, around A1(M) Junctions 3 and 4 and in Hertford, as well as planning applications and committed projects.

Not all of the intervention concepts and ideas would be appropriate to take forward. Some would not align with the objectives of the Corridor Strategy and may work against the priorities of Local Transport Plan 4 and the district authorities' Local Plans.

A process of sifting therefore needed to be used to identify those interventions that had the potential to align with the objectives of the strategy and which are considered to be affordable, deliverable and can deliver positive change.

With regard to the development of interventions, in many cases the Corridor Strategy represents the starting point as many of the interventions have only been identified as concepts. Subsequent and more detailed work will be needed to develop the concepts further. The challenge therefore is considering interventions where they have not yet been developed in detail.

Sifting took place in two phases. The first phase was a high level sift which involved considering how each intervention could help achieve or hinder achieving the objectives of the A414 Corridor Strategy, LTP4 and Local Plans. Some interventions as a consequence were discounted from the list and not considered further.

The second more detailed sift used DfT's EAST (Early Assessment and Sifting Tool). Each intervention was reviewed again in isolation, eliminating those that performed poorly. This process involved qualitatively assessing each intervention separately in relation to a wide range of criteria. EAST is structured around the UK Treasury five cases business model - Strategic, Economic, Management, Commercial and Financial. For the purposes of the strategy, only the Strategic and Economic aspects of the EAST were focused upon because there is insufficient information available for most of the concept interventions to inform a full assessment. The Strategic and Economic cases include the following criteria which was used to review interventions:

Strategic Case:

- Scale impact
- Fit with wider transport and government objectives
- Degree of consensus over outcomes

Economic Case:

- Connectivity and Reliability of journeys

- Wider economic impacts
- Facilitate new housing
- Carbon emissions
- Air quality and noise

Most of the interventions are identified as concepts at this stage, therefore the assessment will be require review as projects are developed and delivered.

This process was followed by packaging the interventions that remained in scope. The purpose of packaging is to identify dependencies, synergies between interventions, and associated housing and employment developments. These aspects are described below.

Dependencies and Synergies: Different interventions have a different scale of relationship to one another. Certain pairs of interventions could be intrinsically linked, i.e. one cannot be implemented without the other, or there may be a sequence in which they need to be delivered. A simple scale of 1-3 was applied, where a score of 1 represents no or very low level of dependency, 2 represents moderate dependency, and 3 represents a high level of dependency.

Enablers: Looking ahead to when interventions could be developed in more detail after the Corridor Strategy, funding and identifying when interventions need to be implemented to have the greatest effect will be important considerations.

Identifying the links to housing and employment (as 'enablers') will influence the size and composition of packages. Provisional information on where planned new development is expected to come forward was taken into consideration.

This should enable local decision makers to identify where future funding contributions towards interventions could be sourced from.

Alignment with the Corridor Strategy: A final iteration of packaging considered the general fit of particular interventions and packages with what the Corridor Strategy is aiming to achieve and the more strategic scope of the strategy.

Some interventions have been sifted out of the Corridor Strategy because they are relatively small-scale or were geographically on the fringes of the study area. This by no means indicates that these interventions, some of which feature in adopted or draft documents, have been dismissed and will not come forward in the future. They will instead be delivered through other plans and strategies.

Final set of packages: The sifting and packaging process has resulted in 30 packages which are spread across the fourteen segments.

The purpose of packaging is intended to highlight the linkages between interventions, particularly where they share the same desired outcomes. It is unlikely that all interventions in a package will be brought forward together and this will depend on a wide variety of factors including funding.

There are some overlaps between packages and some packages feature in more than one segment. Some interventions for example feature in more than one package as they have many dependencies and synergies, or geographically-speaking, they so happen to span more than one segment.

Annex

17

Place & Movement Assessment

Context and Purpose

The A414 Corridor includes a wide variety of different types of roads with different purposes, carrying varying levels of traffic, with different standards of provision for different users of the highway network and different surrounding land uses which influence how roads are used.

With significant planned levels of housing and employment growth coming forward, the corridor faces a complex set of challenges in accommodating additional movements between places and along links. Many roads within the corridor already experience significant levels of traffic congestion, and this has negative implications on surrounding communities. If congestion levels continue to increase, this may force people to find alternative and less suitable routes within the corridor.

Defining the intended function of highway links can inform the process of evaluating the appropriateness of proposed infrastructure interventions and identify alternative interventions which can reinforce intended functions or seek to reprioritise routes for the betterment of communities.

The purpose of defining the network hierarchy is to identify links or junctions where there is considered to be a 'clash' between different functions which could potentially impact on particular users in a positive or negative way.

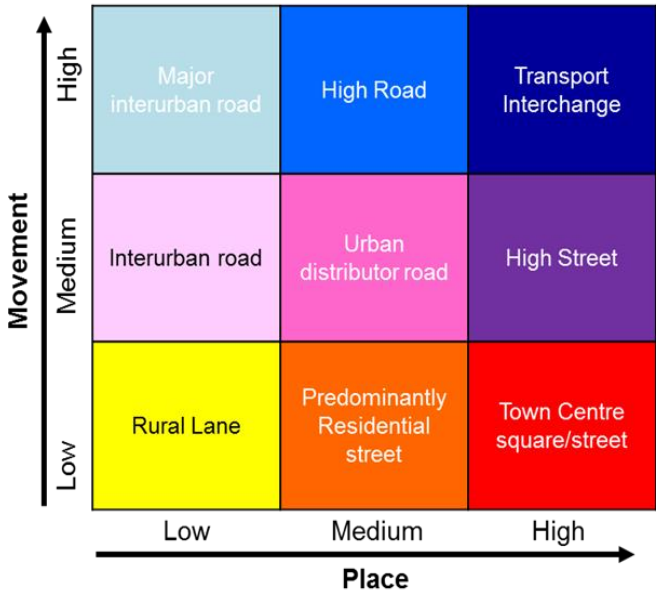
The assessment has been heavily influenced by Transport for London's Street Family which has been used to describe different functions of the capital's roads, which came about as a result of the Roads Task Force recommendations for tackling challenges facing London's roads.

The TfL Street Family is not appropriate to apply to Hertfordshire's network, and therefore the system has been adapted with new road type definitions introduced.

A set of nine road types have been defined. These road types sit within a matrix which qualitatively assesses Place and Movement from low significance to high significance.

The Place axis relates to those functions that are specific to and happen in particular places, including residential and retail. Roads have an impact economically as well as on quality of life, with place-making an increasingly important element in local policy making. Roads are also the foreground to the built environment, and the most successful streets are those that respect and refer to it.

The Movement axis relates to the moving functions across different modes. Roads perform a wide range of movement functions from roads carrying very high volumes and mixes of vehicular traffic and people, to urban street which only have a local movement function.



Rural Lane

→ Low **Place** function

↑ Low **Movement** function

Minor road within rural setting (within countryside or within a hamlet or small village)

Predominantly residential street

→ Medium **Place** function

↑ Low **Movement** function

Inner urban/suburban residential street

Town Centre square/street

→ High **Place** function

↑ Low **Movement** function

Inner urban road or square at the core of a settlement (predominantly retail)

Minor inter-urban road

→ Low **Place** function

↑ Medium **Movement** function

Minor road (A, B or C) connecting two settlements within a rural setting

Urban distributor road

→ Medium **Place** function

↑ Medium **Movement** function

Inner urban/suburban road connecting different parts of an urban settlement and non-residential access road including to industrial estates

High Street

→ High **Place** function

↑ Medium **Movement** function

Inner urban road with a predominance of retail and other commercial land uses, e.g. local shopping parades

Major interurban road

→ Low **Place** function

↑ High **Movement** function

Major A road or Motorway connecting two large urban settlements and carrying more strategic traffic

High Road

→ Medium **Place** function

↑ High **Movement** function

A or B road leading into an urban area with dispersed land uses

Transport Interchange

→ High **Place** function

↑ High **Movement** function

An urban interchange between two or more modes of transport, for example a railway station