HARLOW & GILSTON GARDEN TOWN

PART 2: SUSTAINABLE TRANSPORT CORRIDORS STRATEGY

12 JANUARY 2019

CONTENTS

1 | Introduction

GLOSSARY

AV Autonomous Vehicle: a vehicle that is capable of sensing its environment and navigating partially or wholly without human input.

BRT Bus Rapid Transit: a bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system. BRT systems usually include dedicated bus roadways, and offer priority to buses at junctions where buses may interact with other traffic. They also include design features to reduce delays caused by passengers boarding or alighting buses, or purchasing fares. BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system.

CAV Connected and Autonomous Vehicles: As for AV above, with the addition that connected vehicles use various communication technologies to communicate with the driver, other vehicles (vehicle-to-vehicle [V2V]), roadside infrastructure (vehicle-to-infrastructure [V2I]), and the "Cloud" [V2C]. This technology can be used to not only improve vehicle safety, but also to improve vehicle efficiency and commute times.

E-bikes Electric bikes: a bicycle, also known as a powerbike or booster bike, with an integrated electric motor that can be used for propulsion.

EV Electric Vehicle: a vehicle that uses one or more electric motors for propulsion.

MaaS Mobility as a Service: describes a shift away from personally-owned modes of transportation towards mobility solutions that are consumed as a service. This is enabled by combining transportation services from public and private transportation providers through a unified gateway that creates and manages the trip, which users can pay for with a single account.

Microhub High quality interchange facilities providing seamless and attractive interchange between all modes, includes bike share facilities. These may provide additional facilities such as delivery lockers (for online orders), and should be co-located with local centres to increase their visibility, and community cohesion.

Pocket Place A Pocket Place is a small urban or suburban park that is accessible to the general public, and provides opportunities to sit, dwell and socialise. Pocket Places can act as gateways, for example to larger green spaces or can be standalone spaces. While typically too small for much physical activity to take place within them, they may contain play facilities. They support walking and cycling across all age ranges and levels of physical ability, by providing small delightful and interesting spaces along routes where there are opportunities to rest. Larger Pocket Places can also act as a focus for wider community activity, and could contain public art, and provide important opportunities for social interaction, thereby helping to tackle isolation in local populations.

PT Public Transport: buses, trains, and other forms of transport that are available to the public, charge set fares, and run on fixed routes.

RTI Real Time Information: up-to-the-minute provision of information relating to public transport, enabling customers to plan their journeys with more reliability.

SPONS A comprehensive and up-to-date handbook providing range of indices measuring construction costs and prices.

Supergreenway Attractive walk and cycle routes utilising and expanding Harlow's green network.

TCPA Town and Country Planning Association

TfL Transport for London

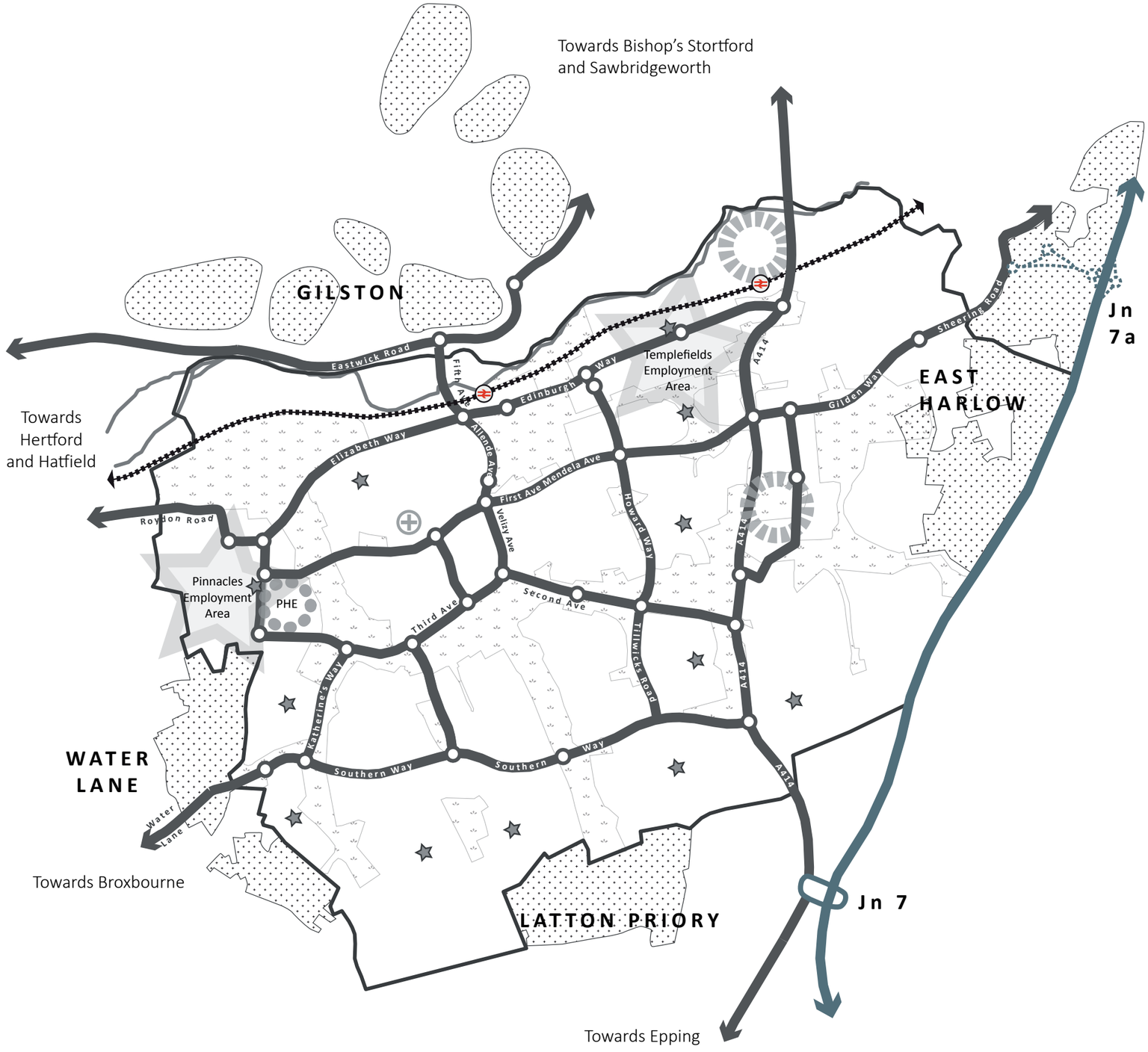
UTC Urban Traffic Control: the method of coordinating traffic signals in a network by the use of timing plans loaded on a centralised computer.

V2V Vehicle to Vehicle: see CAV

VMS Variable Message System: an electronic traffic sign that gives travellers information about special events, traffic congestion, accidents, incidents, roadworks, or speed limits on a specific highway segment. VMS can also provide parking information to guide drivers to available car parking spaces. They may also ask vehicles to take alternative routes.

H&G Garden Town Harlow and Gilston Garden Town.

BASE MAP



Legend

- Harlow Enterprise Zone
- Public Health England
- Hospital
- Hatches
- M11 proposed Junction 7a
- Rail Stations
- Green Wedges
- Proposed Development Sites
- Employment Areas

STRATEGY INTRODUCTION AND PURPOSE

The Harlow and Gilston Garden Town Sustainable Transport Corridors Strategy aims to deliver a transformational increase in the number of people travelling by foot, by bicycle and by public transport, and also seeks to reduce the need to travel. The Part 1 Baseline Report set out the issues currently affecting the Garden Town, and possible opportunities for improvements. This Part 2 report builds on the Part 1 Baseline and sets out the proposed approach and delivery plan to achieve the transformational increase

This document is one of the key strategies which are interdependent and complimentary. The other strategies are;

- HGGT Vision and Design Guide
- Harlow Town Centre Area Action Plan
- HGGT Transport Strategy

The structure of this strategy and its relationship to the Spatial Vision and overarching ambition is illustrated on the opposite page. The elements of the sustainable transport corridor strategy are shown in orange. This document sets out the rationale for, and components of, the Sustainable Transport Corridors strategy.

The Harlow and Gilston Spatial Vision and Design Charter provides an overarching set of principles, design ambition and direction for the delivery of the Harlow and Gilston Garden Town. It has four themes:

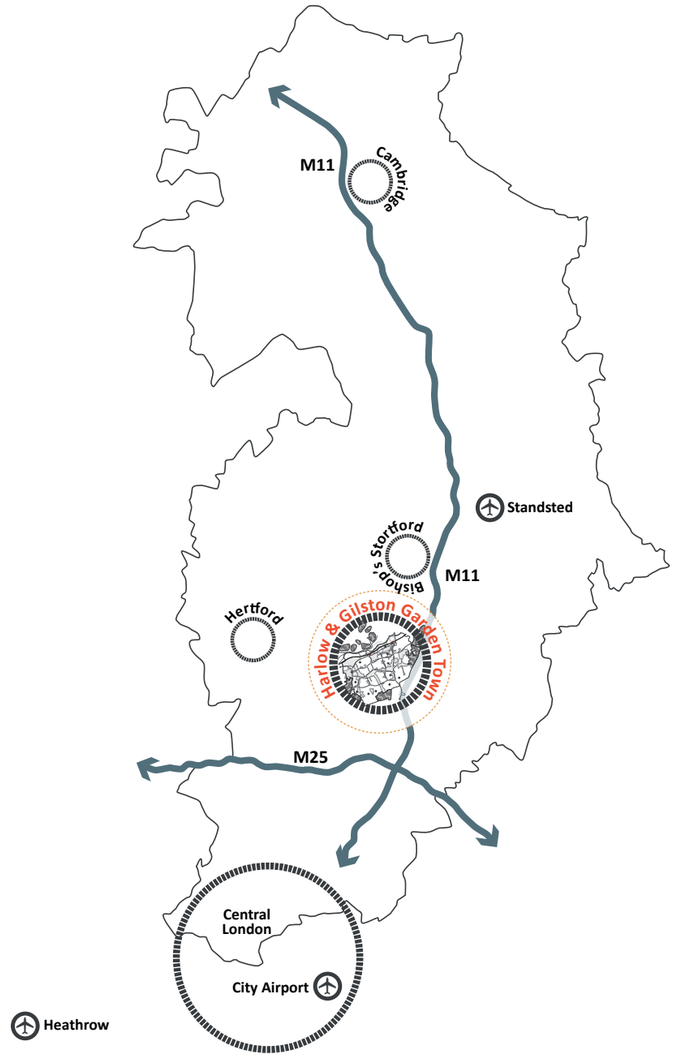
- Placemaking and homes
- Landscape and green infrastructure
- Sustainable Movement
- Economy and regeneration

Clear principles are set out in the Charter that have guided the development of this Sustainable Transport Corridors Strategy and implementation plan. Those relating to sustainable transport and well-being, and also landscape and green infrastructure are particularly relevant to this strategy.

The emerging Harlow Town Centre Area Action Plan (AAP) provides a framework for the delivery of a reinvigorated Harlow Town Centre, and the document anticipates opportunities for improving bus and rail interchange as part of initiatives to encourage active travel. This Strategy has considered suggestions to introduce a Bus Rapid Transit (BRT) system within the Garden Town.

GENERAL POLICY OVERVIEW

The Garden Town is at the heart of the London, Stansted, Cambridge Corridor (LSCC) and is one of the fastest growing economic regions in the UK. The scale of growth is significant but the ambition is to build on the clear identity of Harlow New Town to develop a modern Harlow and Gilston Garden Town.



STRATEGY SCOPE

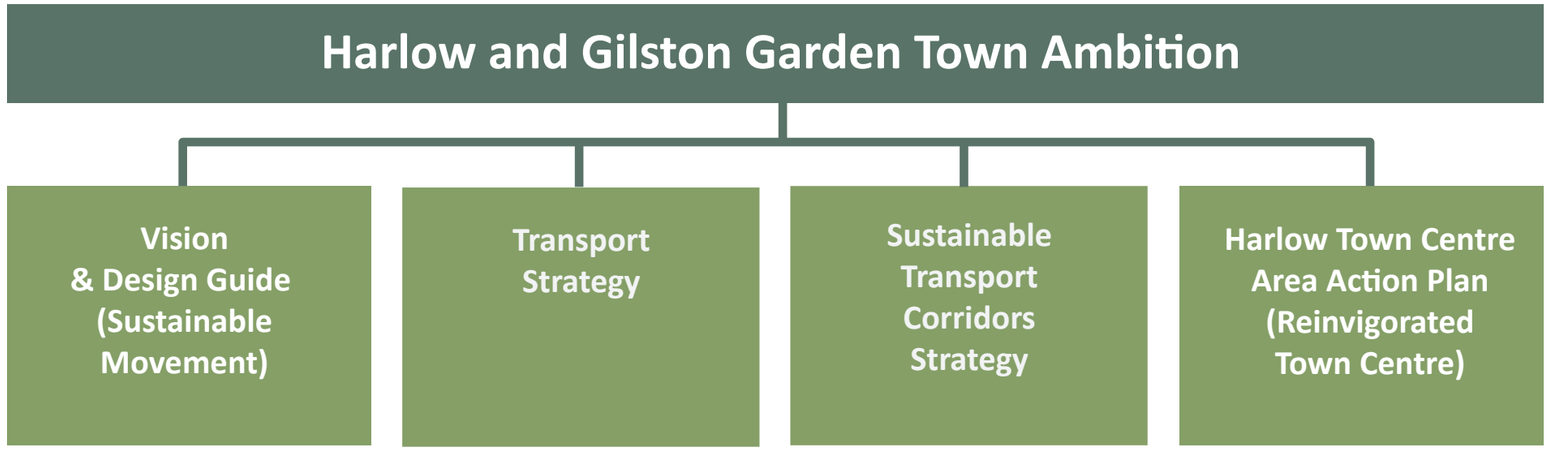
This Strategy consists of three tiers:

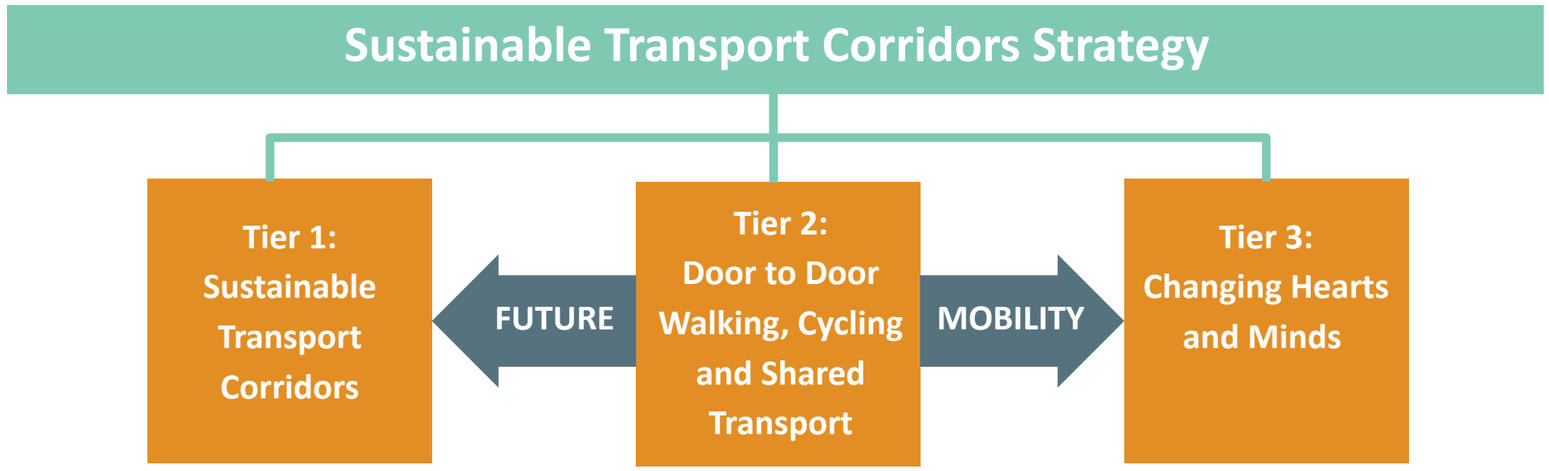
1. **Sustainable Transport Corridors - Walk-cycle super-greenway / Bus Rapid Transit**: These corridors will provide a very high quality 'spine' for walking cycling and public transport. The sustainable transport corridors will be at the top of the sustainable transport network hierarchy and will connect key destinations in the town with each other and with the areas of new development.
2. **Door to door walking, cycling and shared transport**: Walking, cycling and public transport journeys need to be considered from door to door. The sustainable transport corridors are at the top of the sustainable transport hierarchy and this tier addresses the wider street, walking and cycling and local bus service networks within the Garden Town, thereby ensuring that people can travel from 'door to door' sustainably
3. **Changing hearts and minds:** To achieve a transformational change in the levels of use of sustainable modes partnership working including with public transport operators, businesses, schools and the public is needed to change hearts and minds towards sustainable transport

Underlying the three tiers is the consideration of 'Future Mobility'. Solutions throughout the strategy have taken account of known and expected future changes in technology that will impact how people travel. The strategy therefore enables the Garden Town to embrace new technologies as they emerge and take advantage of opportunities that will encourage existing and new residents and employees to choose to travel sustainably.

The structure of this strategy and its relationship to the Spatial Vision and overarching ambition is illustrated here. The three tiers of the Sustainable Transport Corridors Strategy are shown in orange.

The Corridors themselves are described on the following pages.





GARDEN TOWN PRINCIPLES & AMBITIONS TODAY

Delivery of the Harlow and Gilston Garden Town will be steered by East Herts District Council, Harlow Council and Epping Forest District Council.

This joint working seeks to deliver 16,258 new homes within the Garden Town by 2033, including 3,000 homes in the Gilston area.

The table below indicates how this significant housing provision will be split between the three Local Authorities, and provides an indication of potential build-out rates during the current plan period.

The Hertfordshire LEP Concept Framework highlights the proposed development sites in the Gilston area that could ultimately provide 10,000 new homes, with approximately 3,050 of these delivered during the current plan period.

A total of 3,900 new homes are proposed within Epping Forest District at Water Lane (formerly West Katherine's and West Sumners), Latton Priory and East Harlow.

Within Harlow itself, up to 9,308 new homes could be accommodated, with 2,600 of these within East Harlow.

Location/Site	Completions To 2017	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	Total by 2033
West of Harlow		0	0	0	0	100	200	200	200	200	200	200	200	200	200	200	0	**2,100**
East of Harlow (EFDC site)		0	0	0	0	0	50	100	100	100	100	100	100	100	0	0	0	**750**
East of Harlow (Harlow site)		0	0	0	100	200	250	300	300	300	300	300	300	250	0	0	0	**2,600**
South of Harlow		0	0	0	0	50	100	100	100	100	100	100	100	100	100	100	0	**1,050**
Gilston		0	0	0	0	0	50	300	300	300	300	300	300	300	300	300	300	**3,050**
Harlow existing urban area	1,436	562	1,088	820	629	523	200	160	134	75	75	321	354	226	105	0	0	**6,708**
Total strategic	**1,436**	**562**	**1,088**	**820**	**729**	**873**	**850**	**1,160**	**1,134**	**1,075**	**1,075**	**1,321**	**1,354**	**1,176**	**705**	**600**	**300**	**16,258**

The Garden Town will be developed to address nine *Principles for Garden City development* as set out by the Town and Country Planning Association (TCPA) in its publication "Re-imagining garden cities for the 21st century", 2011.

1. Land value capture for the benefit of the community
2. Strong vision, leadership and community engagement
3. Community ownership of land and long-term stewardship of assets
4. Mixed-tenure homes and housing types that are genuinely affordable
5. A wide range of local jobs in the Garden Town within easy commuting distance of homes
6. Beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy communities, and including opportunities to grow food
7. Development that enhances the natural environment, providing a comprehensive green infrastructure network and net biodiversity gains, and that uses zero-carbon and energy-positive technology to ensure climate resilience
8. Strong cultural, recreational and shopping facilities in walkable, vibrant, sociable neighbourhoods
9. Integrated and accessible transport systems, with walking, cycling and public transport designed to be the most attractive forms of local transport

Development of the Harlow & Gilston Garden Town seeks to build upon these foundations to deliver a fit for purpose town, that, in the words of Gibberd, "*... would go on changing and being rebuilt as the needs of people altered*."

DRIVERS FOR CHANGE

To support delivery of the Garden Town ambitions, there are several interconnecting factors that need to be addressed. These are the *Drivers for Change*, and include the need to:

1. Improve the attractiveness of Harlow and Gilston as a place to live, work and visit
   - » Harlow has many attractive areas and greenspaces, but some parts of the town feel vehicle dominated and others lack distinctiveness
   - » Highways serving the town and the segregation of walking and cycling networks also result in severance, maintenance issues and in some locations negative feelings of safety and security for walkers and cyclists
   - » The green wedges are also felt to separate communities rather than bring them together
   - » The Sustainable Transport Corridors Strategy needs to address these issues by enhancing the quality of Harlow and Gilston's streets and spaces, and ensuring that attractive routes connect and enhance key assets
2. Improve health
   - » Healthy life expectancy for residents of Harlow is below the national average and childhood obesity is an issue
   - » Poor health and wellbeing has a wide range of contributory factors but lack of exercise and social isolation can cause or exacerbate both physical and mental health problems. Ensuring there are attractive destinations to walk and cycle to and that the cycling and walking networks are enjoyable to use, visible, legible and accessible to all will be a key component to improving both adult and child health
   - » Also important will be behaviour change programmes which support and encourage walking and cycling and encourage community engagement

3. Support sustainable growth and regeneration
   - » The significant ambitions for growth in Harlow and Gilston Garden Town will generate an increase in travel demand. This demand needs to be accommodated sustainably efficiently - reducing travel where possible - whilst also contributing towards wider objectives including place making, health and sustainability. This means there will need to be a far greater proportion of trips undertaken by sustainable modes of transport.
4. Connect existing and new communities
   - » Currently the green wedges sit between communities, but by providing space for sustainable corridors, they can act as a catalyst to bring them together.
   - » Walk, cycle and greenspace networks have a critical part to play in integrating new and existing communities together
   - » The Sustainable Transport Corridors Strategy has a key role in delivering a sustainable walk / cycle network with a core of very high quality links that connect communities to each other, to key leisure assets, and to work
5. Ensure resilience and flexibility to accommodate new and innovative technologies
   - » As current transport provision is impacted by new technologies including electric and autonomous vehicles (AV), the subsequent changes to the shared transport market - e.g. car clubs - in particular will be important to ensure long term resilience in its provision
   - » Public transport must be financially sustainable and able to respond to changing market conditions and demands. Ensuring the maximum possible catchments, providing comprehensive bus priority, working with bus operators and improving quality, will be key to establishing a resilient high quality public transport offer
   - » Ensure new infrastructure can 'flex' to accommodate a variety of vehicles and interchange requirements and changing behaviours.

Informal pedestrian crossing on Haydens Road illustrates inconsistent provision of tactile paving and dropped kerbs, and excessive use of guardrail. Cracked paving slabs hint at maintenance issues and will eventually become a trip hazard. All crossings must provide inclusive access to all.

2 | Key Challenges and Opportunities

KEY CHALLENGES AND OPPORTUNITIES

There is both an aspiration and need for a transformational change in the levels of use of sustainable modes of transport. There are a number of key transport challenges and opportunities that need to be understood to deliver this.

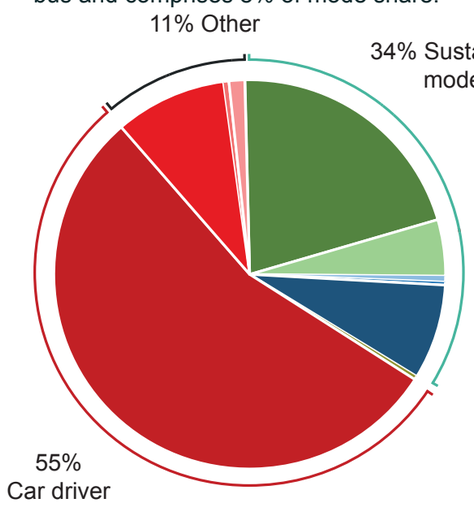
CURRENT TRAVEL BEHAVIOUR

Travel to Work (TTW) behaviour (based on Census 2011) within, to and from Harlow indicates a high proportion of car use but also some clear opportunities to increase the use of sustainable modes building on current levels of sustainable transport use within Harlow.

WITHIN HARLOW

There are already good levels of sustainable transport use within Harlow, but also a real opportunity to increase the proportion of TTW journeys made by sustainable modes, in particular cycling, public transport and car share.

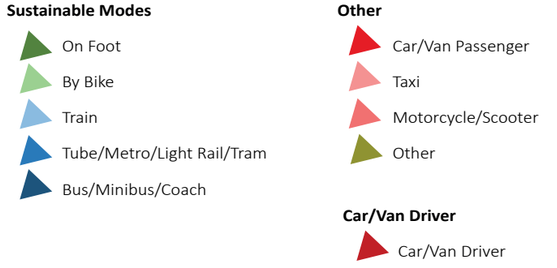
- Car drivers make up 55% of trips, with sustainable modes accounting for 34%, primarily through walking. Just over 9% of TTW journeys are as car passengers, suggesting there is already some car-sharing for local TTW journeys. This is approximately double the proportion from into or out of Harlow as passengers.
- Sustainable mode split comprises: Passenger 9%, Bike 5%, Walk 21%, PT 9%
- Most public transport for TTW within the town is bus and comprises 8% of mode share.

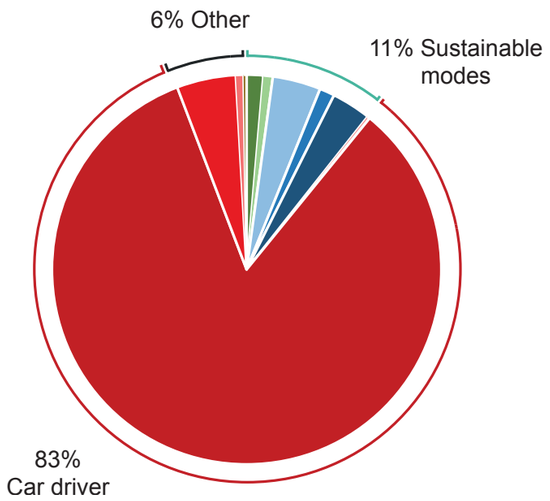


TO HARLOW

For travel to Harlow significant numbers travel from Epping and Bishops Stortford and there is an opportunity to improve access by sustainable modes and encourage car sharing from these places.

- 83% of people travelling to Harlow from outside are car drivers, and only 11% travel by sustainable modes
- Sustainable mode split comprises: Passenger 5%, Bike 1%, Walk 1%, PT 9%
- The breakdown of public transport use is: Rail: 4%, Tube/Metro/Light Rail: 1.2%, Bus: 3%





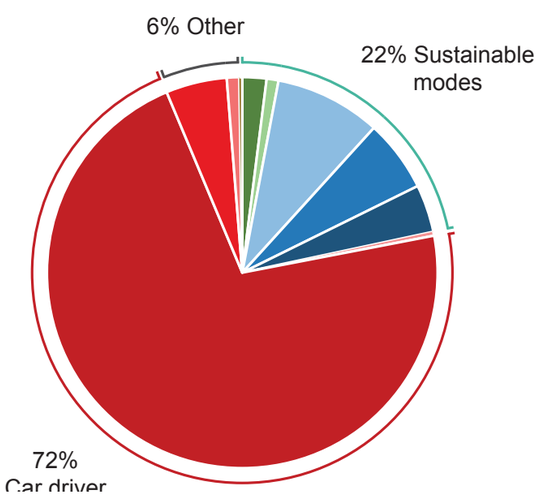
FROM HARLOW

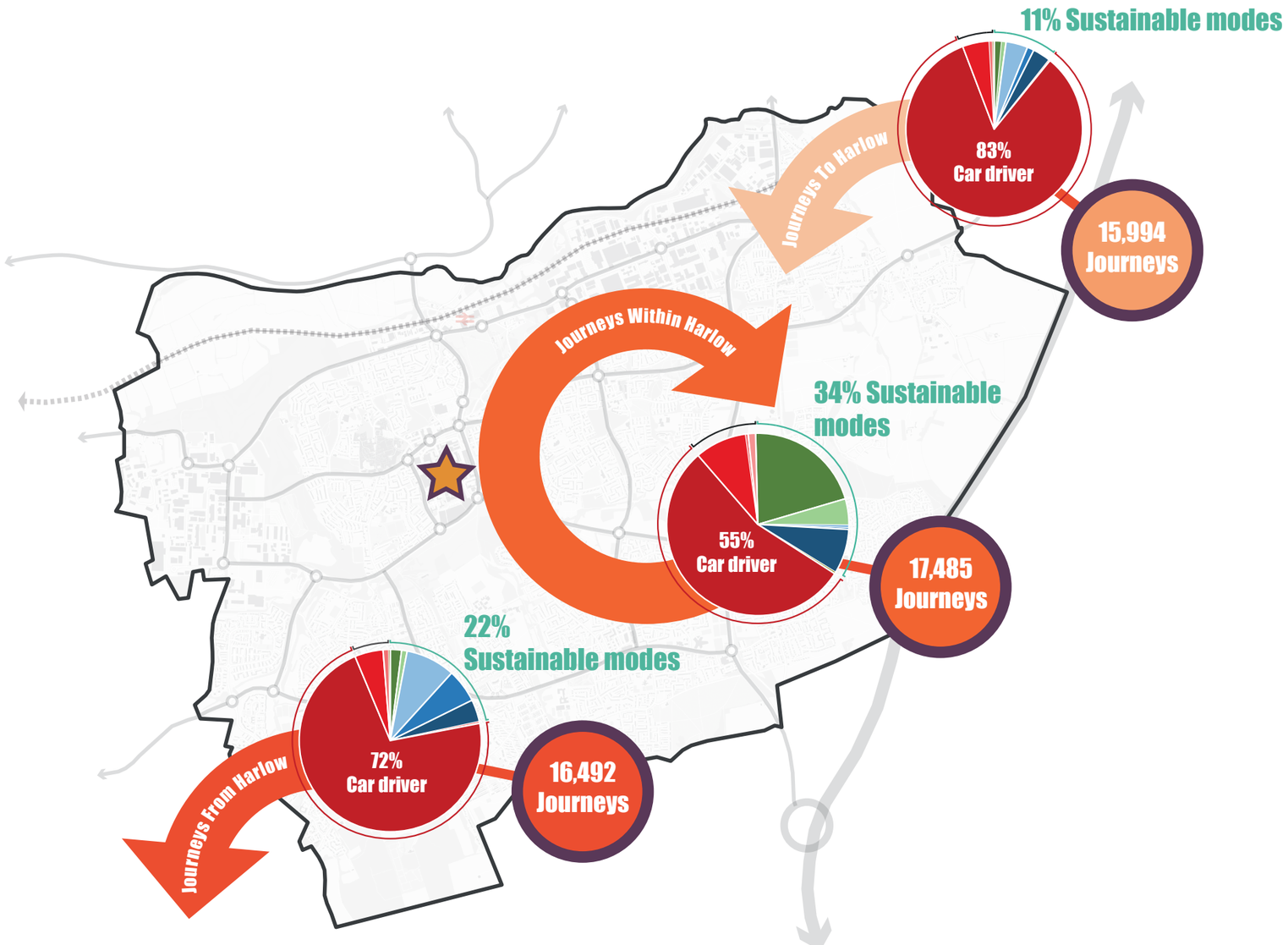
A higher proportion of people travel from Harlow by sustainable modes than to Harlow. This reflects travel patterns into central London. It is likely that a proportion of these sustainable trips also comprise a car trip within Harlow and Gilston as a result of people driving to the rail or underground stations.

- The sustainable mode share is double that of those travelling into Harlow, at 27% - reflecting, at least in part, a significant number of TTW trips from Harlow to work in London, via mainline rail and tube from Epping
- Sustainable mode split comprises: 5.1%, Bike 1%, Walk 2%, PT 19%
- The breakdown of public transport use is: Rail: 9%, Tube/Metro/Light Rail: 6%, Bus: 4%

CHALLENGES

High levels of private car use, and low levels of public transport use for those travelling to work *to* or wholly *within* Harlow represent particular challenges.





RAIL TRAVEL

The table below indicates numbers of people entering and exiting rail stations during 2016-2017. It can be seen that Harlow Town rail station is by far the most popular, with almost 2 million entries and exits during this year.

Improving sustainable links to the station, and passenger facilities at the station, will further enhance use of this mode.

STATION NAME	16/17 ENTRIES & EXITS
Harlow Mill	227,756
Harlow Town	1,908,742
Roydon	131,674
Sawbridgeworth	526,568

LEGEND

- Town Centre
- Journeys To Harlow
- Journeys Within Harlow
- Journeys From Harlow

Sustainable Modes

- On Foot
- By Bike
- Train
- Tube/Metro/Light Rail/Tram
- Bus/Minibus/Coach

Other

- Car/Van Passenger
- Taxi
- Motorcycle/Scooter
- Other

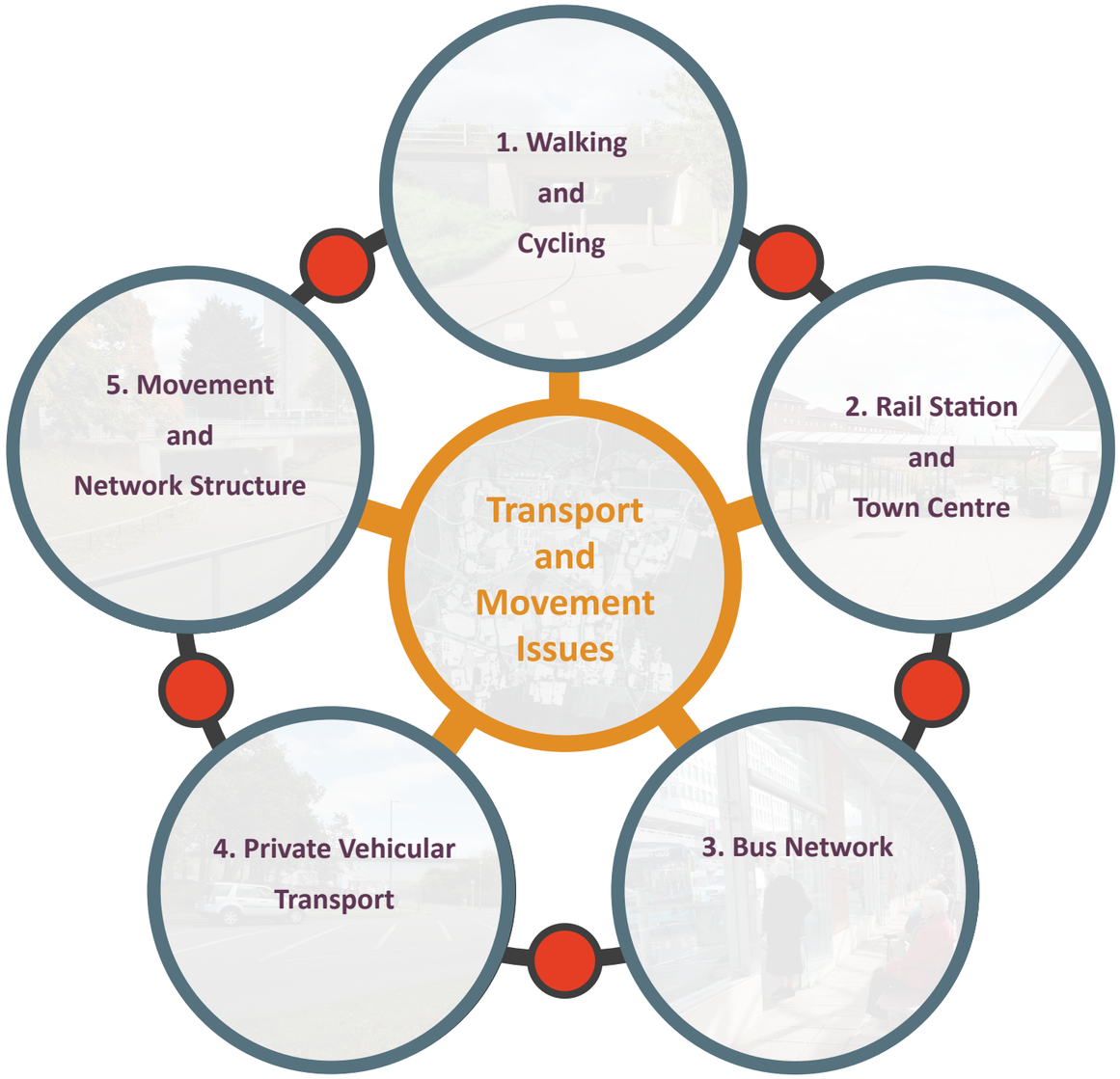
Car/Van Driver

- Car/Van Driver

CURRENT TRANSPORT AND MOVEMENT ISSUES

Given the challenges previously identified in the Issues and Opportunities Report, this diagram highlights the key issues affecting movement and transport in the Garden Town area:

1. Walking and Cycling
   - » Walk / cycle networks are often indirect, lacking in visibility and difficult to navigate
   - » Networks often have sections that are poorly overlooked and don't feel safe at some or all times of day
   - » Key highways can be a barrier to walking and cycling due to speeds, design and lack of crossing facilities e.g. town centre ring road
   - » Lack of regular seating and rest points
   - » Local and strategic networks often lack distinctiveness, interest and quality
   - » Introverted form of development in the town centre presents dead frontage to some routes
   - » High speed limits e.g. residential streets are typically 30mph / key streets 40mph
   - » Some shared walking and cycling provision is typically only 3m wide which is insufficient to accommodate either high volumes of users, or, users wanting go at significantly different speeds, resulting in conflict
2. Rail Station and links to the town centre
   - » Poor arrival and interchange experience at Harlow Town Station and poor and indirect walking and cycling link to the Town Centre
   - » Poor quality environment in places
   - » No northerly access to Harlow Town station
3. Bus Network
   - » Bus station has a poor quality environment and is not ideal operationally
   - » Frequency and quality of local and strategic bus services and infrastructure is variable
   - » Lack of direct services to key destinations e.g. Harlow Town rail station reduces desirability and convenience of using the bus
   - » Congestion in the am and pm peaks causes delay and affects reliability around the town and between the town centre and rail station
   - » Reliance on County Council subsidy (mainly evenings and weekends)
   - » The bus networks are complex. Few are cross town and there are key employment areas that are not served
   - » Residential density is relatively low, resulting in challenging operating conditions
   - » Limited services go into the rail station and egress is particularly difficult for buses
   - » There have been historic issues with low quality operators which are still a concern
   - » Limited real time information available at bus stops
4. Private Vehicular Transport
   - » Despite existing congestion during morning and evening peak hours, vehicle access is generally easy and direct which is reflected by the current journey to work mode share
   - » Existing Town Centre parking is easily available and is inexpensive
   - » Parking is available at employment sites
   - » Ease of use of the private car results in few advantages / benefits to walking / cycling or using public transport for daily or leisure trips
5. General Movement Network Structure
   - » There are key barriers to north / south movement in particular, namely the Stort Valley, the railway line, green wedge network
   - » The street network provides good connectivity within neighbourhoods but provides limited connections between neighbourhoods. The major roads between neighbourhoods also sever connections by virtue of their design and vehicle speeds.



3 | Sustainable Transport Corridors Strategy

OBJECTIVES

To ensure the most appropriate and effective package of measures is proposed it is important to be clear about the outcomes the Sustainable Transport Corridors Strategy is seeking to deliver.

Whilst this Strategy and implementation plan is seeking a transformational change in the level of people using sustainable modes of transport there are also specific objectives that need to be delivered that address both transport and wider issues.

The objectives below have been developed with the client team and were also discussed with stakeholders during a workshop.

OBJECTIVE 1

An average of 50% of all journeys are made by sustainable modes across the town with 60% in the new settlements.

OBJECTIVE 2

High quality, rapid, and high frequency public transport that competes with single occupier car journeys.

OBJECTIVE 3

Harlow and Gilston has a strong walking and cycling culture and most people can identify somewhere they love to walk or cycle to.

OBJECTIVE 4

Easy to access, convenient and inclusive sustainable travel is available to all, and seen as the first choice.

OBJECTIVE 5

The walk and cycle network and associated public spaces are used by all communities and they bring communities together.

OBJECTIVE 6

The transport network is resilient and can accommodate and respond to changing technologies and associated opportunities.

The proposed approach and packages of measures that have been identified are those which will most effectively deliver these objectives.

Monitoring of these objectives will be necessary to ensure adequate progress is being made, and to tailor delivery as required. A proposed approach to monitoring is set out in Section 11.

TOWARDS TRANSFORMATIONAL CHANGE

To achieve a step change in the levels of use of sustainable transport and to address the wider desired outcomes of the Harlow and Gilston Garden Town the following approach is proposed:

1. Develop a three tier intervention plan consisting of:
    - » Changing hearts and minds of existing and new residents and businesses, and partnership working towards a shared goal of more sustainable healthy travel and reducing the need to travel.
    - » Enabling door to door walking, cycling and shared transport
    - » Sustainable Transport Corridors - Bus Rapid Transit (BRT) / Walk-cycle super-greenway
2. Develop an additional *Future Mobility* facet that makes use of emerging technologies to encourage and deliver more sustainable travel, improve resilience and spread the message as far as possible. This will enable the Garden Town to embrace new technologies as they emerge and utilise opportunities to encourage existing and new residents and employees to travel sustainably.

These elements are described in more detail below, and are illustrated on the plan opposite. In addition, Appendix B presents information from places around the UK and in Europe, outlining the key characteristics that have helped them to achieve high sustainable mode share. This has also informed the development of the Harlow and Gilston Sustainable Transport Corridors Strategy.

SUSTAINABLE TRANSPORT CORRIDORS

These corridors will provide a very high quality key network for walking, cycling and public transport. The sustainable transport corridors will be at the top of the sustainable transport hierarchy and will connect key destinations in the town with each other and with the areas of new development. The key components of this approach are;

BUS RAPID TRANSIT – BRT

- High quality high frequency bus service
- Segregated / bus priority where required which can accommodate other ‘ shared ‘ transport services as they emerge
- High quality interchange – town centre / station / micro hubs in new development

WALK-CYCLE SUPER-GREENWAYS

- Segregated from vehicles
- Direct and legible
- Linear parks and Pocket Places
- Accessible and attractive for all users of all ages and abilities

DOOR TO DOOR WALKING AND CYCLING AND SHARED TRANSPORT

Walking, cycling and public transport journeys need to be considered from door to door and the key components of this approach are;

- Ensure the existing street network is attractive for walking and cycling
- Revitalise the town’s existing walking and cycling network, and fill in key missing links
- Provide connections to the walk-cycle super-greenways
- Reduce severance and conflicts
- Deliver streets in the new development that are attractive for and support walking and cycling
- Provide cross town bus services with coordinated timetables

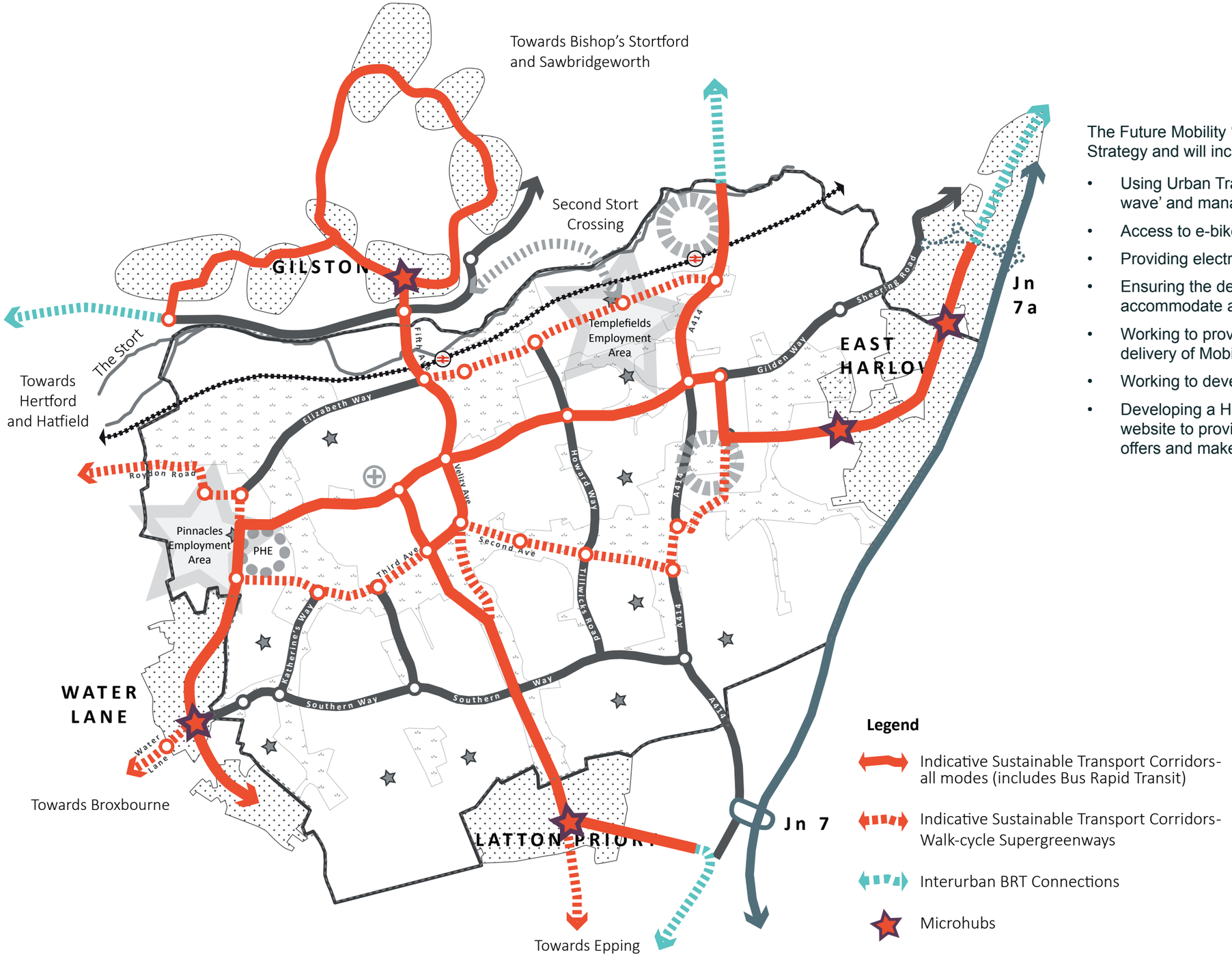
CHANGING HEARTS AND MINDS AND PARTNERSHIP WORKING

To achieve a transformational change in the levels of use of sustainable modes, partnership working including with public transport operators, businesses, schools and the public is needed. The key components of this approach would include;

- Making active travel the first choice
- Formal partnership working with the public transport operators
- Travel planning and behaviour change programmes
- Promoting sustainable transport options including ride sharing, car clubs, e-bikes
- Events e.g. community cycle rides, play streets, pop up cafés

INDICATIVE SUSTAINABLE TRANSPORT CORRIDORS

Those routes that are considered suitable for inclusion as Sustainable Transport Corridors are shown here.



FUTURE MOBILITY

The Future Mobility 'facet' will work across all other aspects of the Strategy and will include:

- Using Urban Traffic Control (UTC) to give public transport a 'green wave' and manage traffic
- Access to e-bikes throughout the Garden Town
- Providing electric charging infrastructure
- Ensuring the design of new infrastructure can 'flex' and accommodate a variety of vehicle types
- Working to provide the transport data necessary to support the delivery of Mobility as a Service (MaaS)
- Working to develop smarter ticketing
- Developing a Harlow and Gilston Garden Town travel 'app' and website to provide up-to-date travel information, promote special offers and make it easy to travel actively

In some locations there are distinct opportunities to reinforce desire lines and provide inclusive access - here on Fourth Avenue, pedestrians have taken matters into their own hands.

4 | Overview of the Sustainable Transport Corridors

CORRIDOR OPTIONS

The key considerations that have determined which corridors should be Sustainable Transport Corridors are set out below. The Corridors have been assessed against the following criteria, and ranked for their compliance in the table opposite:

DIRECTNESS

The Corridors need to provide direct, high quality links.

CONNECT NEW HOUSING AND KEY ASSETS

The Corridors need to connect the new housing areas with key town assets such as the town centre, rail and bus stations, employment areas and retail centres.

POTENTIAL FOR BUS / BUS RAPID TRANSIT (BRT)

Routes need to be well related to existing development. Corridors on existing highway are expected to already accommodate bus services. There should also be either existing bus priority or the opportunity to develop / improve bus priority where required.

POTENTIAL FOR VERY HIGH QUALITY WALK / CYCLE LINKS

Improvements to walking and cycling links offer an opportunity for significant enhancements to upgrade facilities from functional to enjoyable to use. Overlooking/natural surveillance of the links will be important to ensure they improve the perception of safety.

WILL SUPPORT SUSTAINABLE TRAVEL CHOICES FOR NEW AND EXISTING COMMUNITIES

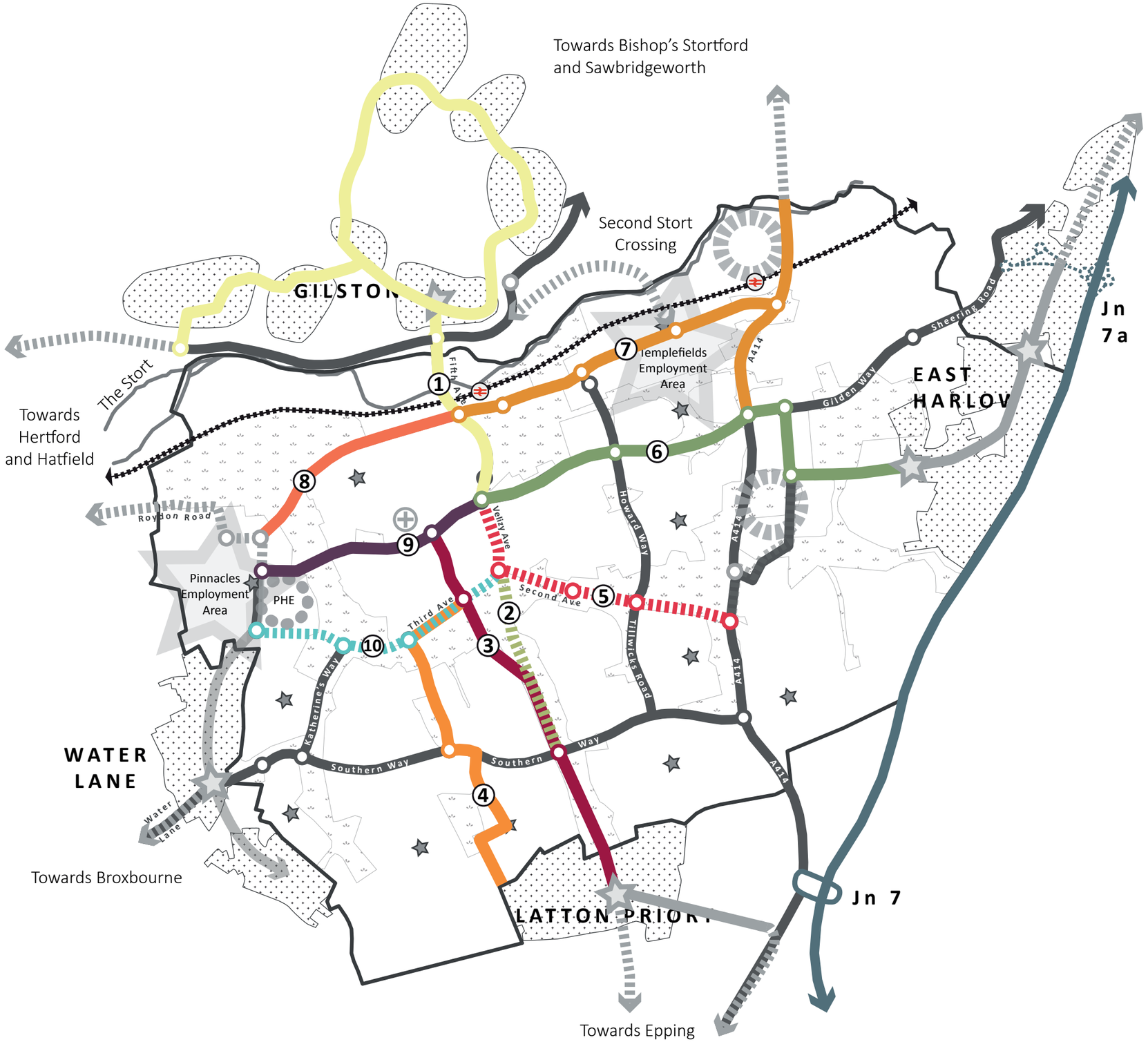
Corridors should be well related to existing development and therefore accessible by existing communities and able to support mode shift within both new and existing communities.

CAN TRANSFORM BRT AND CYCLING / WALKING ON THE SAME CORRIDOR

Providing very high quality public transport and walk / cycle facilities on the same Corridors has a number of key benefits including legibility and the opportunity for interchange.

LONG TERM REVENUE SUPPORT REQUIREMENT

Wherever possible, the locations of the BRT routes need to be such that the risk of a requirement for long term revenue support is reduced/ removed. Providing these routes along corridors where existing bus services run successfully and where there is the highest catchment of riders both from existing and future residents will increase the potential viability of the corridors.



Legend

- North: Option 1- Fifth Avenue
- South: Option 2- Velizy Avenue
- South: Option 3- Haydens Road
- South: Option 4- Abercrombie Way
- East: Option 5- Second Avenue
- East: Option 6- First Avenue
- East: Option 7- Edinburgh Way
- West: Option 8- Elizabeth Way
- West: Option 9- Fourth Avenue
- West: Option 10- Third Avenue

Potential Extension

The table below assesses each of the potential corridors against these criteria using a red amber green weighting.

Red = high risk/poor fit

Amber = medium risk/medium fit

Green = low risk/good fit

The proposed Sustainable Transport Corridors are the ones, from each set of options, rated as having the highest fit/suitability to the considerations cited here. These are the ones with most green entries and fewest amber and red ratings in the table below.

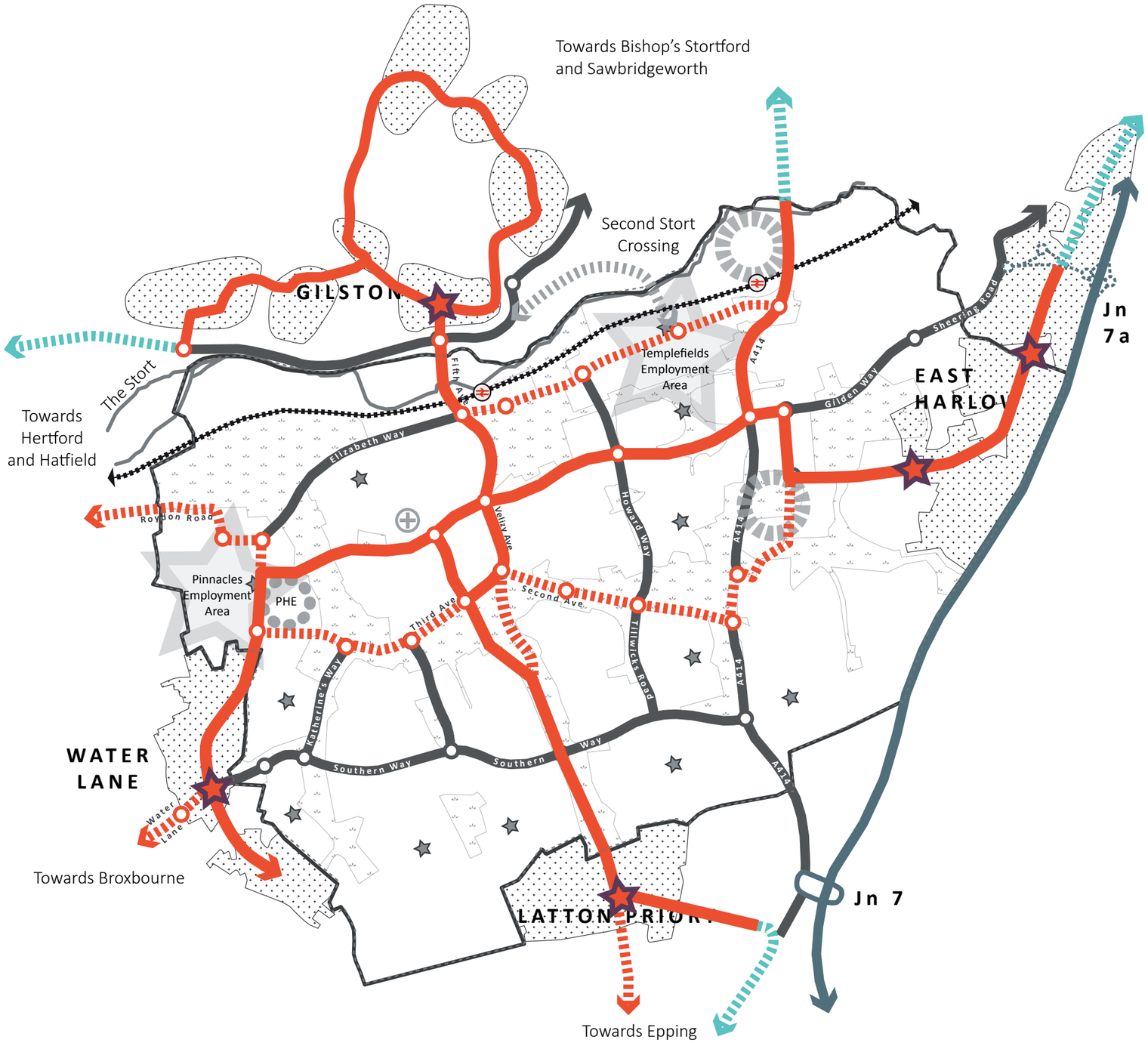
	Direct	Connects new housing developments and key assets	Potential for Bus / BRT	Potential for very high quality walk / cycle links	Will support sustainable travel choices for existing communities	Bus BRT and cycling walking can be transformed on the same corridor	Risk of long term revenue support	Proposed Sustainable Transport Corridor
North: Option 1 - Fifth Avenue								Bus Rapid Transit Cycle/walk Supergreenway
South: Option 2 - Velizy Avenue				★				Cycle/walk Supergreenway
South: Option 3 - Haydens Road				★				Bus Rapid Transit Cycle/walk Supergreenway
South: Option 4 - Abercrombie Way				★				
East: Option 5 - Second Avenue								Cycle/walk Supergreenway
East: Option 6 - First Avenue								Bus Rapid Transit Cycle/walk Supergreenway
East: Option 7 - Edinburgh Way								Cycle/walk Supergreenway
West: Option 8 - Elizabeth Way								
West: Option 9 - Fourth Avenue								Bus Rapid Transit Cycle/walk Supergreenway
West: Option 10 - Third Avenue								Cycle/walk Supergreenway

★ By upgrading existing cycle walk link south through greenspace

INDICATIVE CORRIDORS

A significant increase in the use of sustainable modes of travel within Harlow and Gilston Garden Town will require public / shared transport to be transformed. **Bus Rapid Transit (BRT)** will be at the top of a three-tiered public / shared transport hierarchy that also includes local cross town bus services, and demand responsive services as part of the Door to Door element (see Section 5).

Sustainable Transport Corridors will also deliver a core network of very high quality **Cycle/walk Supergreenways**. These would be enjoyable to use, in places delightful and accessible for users of all ages and abilities. On busy sections cyclists and pedestrians would be segregated from each other and on all sections cyclists and pedestrians would be segregated from traffic. Routes would be constructed in places as linear parks, and elsewhere be enhanced with regular pocket places to create high quality legible links. These links feel safe to use at all times and therefore routes should also be well overlooked.



Legend

- Indicative Sustainable Transport Corridors- all modes (includes Bus Rapid Transit)
- Indicative Sustainable Transport Corridors- Walk-cycle Supergreenways
- Interurban BRT Connections
- Microhubs
- Potential Extension

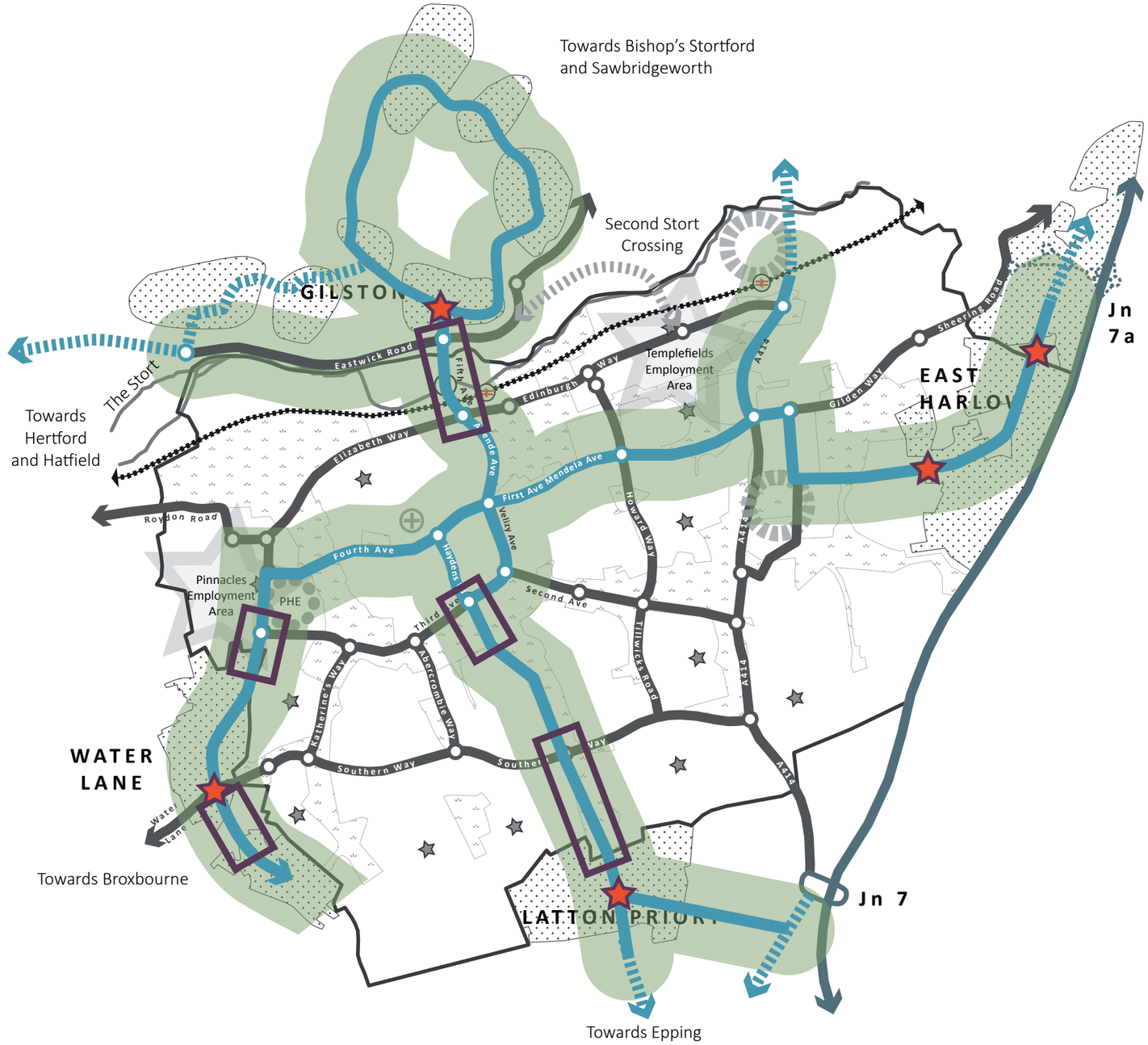
BUS RAPID TRANSIT

Bus Rapid Transit (BRT), running along the Sustainable Transport Corridors, will be focussed on providing a branded limited stop, high frequency service to connect new housing developments with employment including the town centre and wider transport interchange including to rail and the underground. Typical features would include:

- Bus priority where required to ensure reliable quick journey times and to provide an advantage for public / shared transport over single occupier car use
- Using UTC to enable buses to be given priority at junctions and facilitate a bus ‘green wave’
- Providing high quality bus stops with real time information
- Working in partnership with bus operators to drive up vehicle and service quality in particular on BRT routes
- Working to deliver electric buses in particular on BRT routes and associated charging infrastructure
- Working to ensure the transport data which is needed for the development of MaaS platforms is available as open data
- Ensuring the method of providing bus priority can be used by other ‘shared’ vehicles as the MaaS market develops
- Smart ticketing

Improvements to bus services need to address the following issues:

- Significant delay to buses through the town centre and between the town centre and the station in particular
- Approach to providing public transport to new developments needs to be viable within reasonable timeframe and resilient



WALK-CYCLE SUPERGREENWAYS

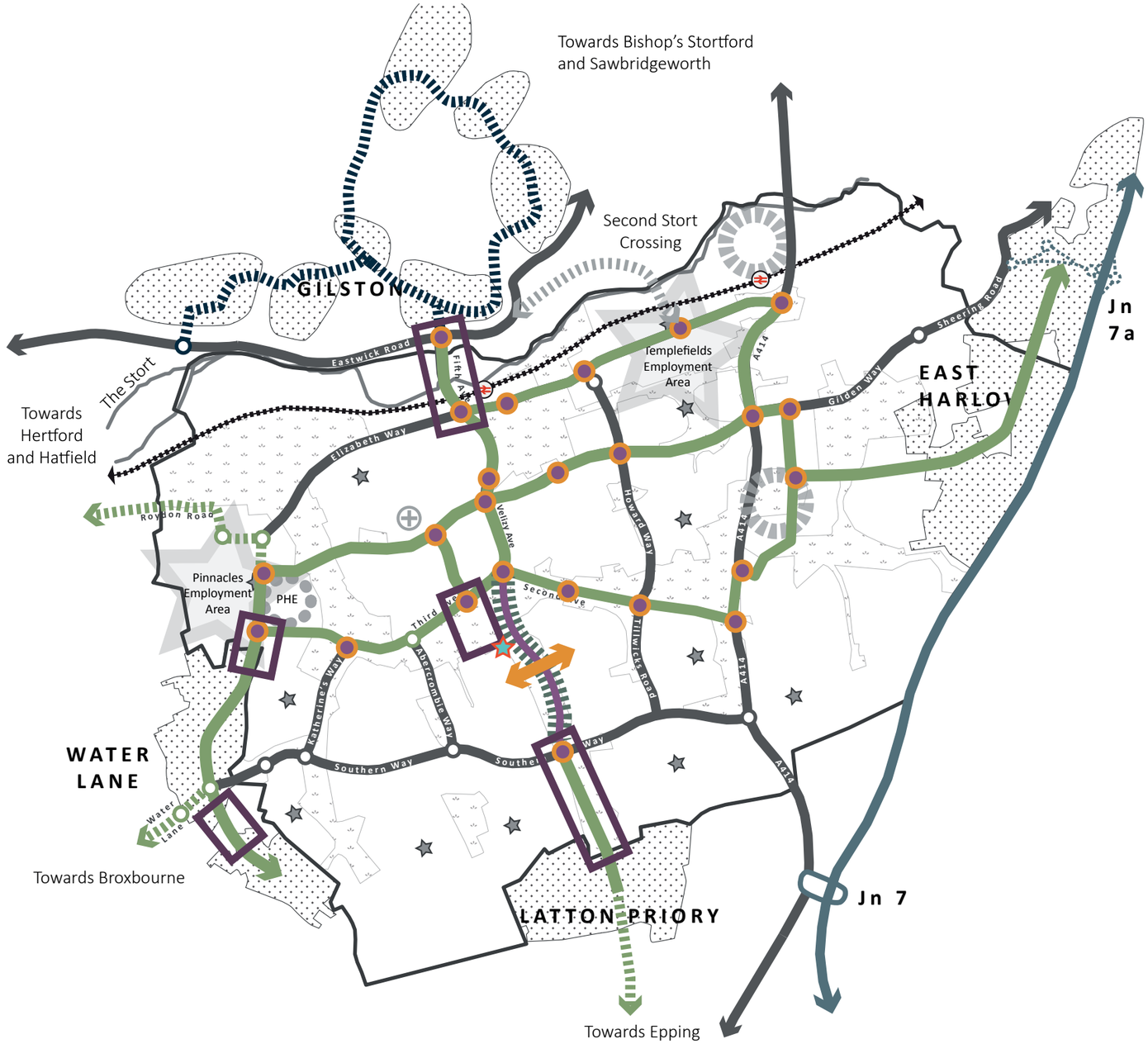
There is an opportunity to deliver a core network of very high quality walk-cycle supergreenways. These would be enjoyable to use, in places delightful, and accessible for users of all ages and abilities.

On busy sections pedestrians and cyclists would be segregated from each other and on all sections pedestrians and cyclists would be segregated from traffic.

Routes would be constructed in places as linear parks, and elsewhere be enhanced with pocket places to create high quality legible links.

In addition these links should feel safe to use at all times and therefore be well overlooked.

- Landscape, pocket places and regular seating to encourage people to dwell
- Distinctive wayfinding, lighting and public art / creative interventions
- Place walk / cycle routes near enough to carriageway edges to enable overlooking and interchange
- Ensure priority at junctions favours active modes, with direct, overlooked and at grade crossings that are suitable for all, irrespective of age and ability. Ensure pavements cross side roads.
- Ensuring overlooking from developments wherever possible.
- Improve crossing facilities and frequency. Desire lines show some areas where there is unfulfilled pedestrian demand, and should be used to guide the location of new facilities, or re-siting of existing ones.
- Ensure the facility is wide enough to accommodate significant growth in walking and cycling, other 'slow modes' vehicles such as 'pods' that may develop in the future, and also accommodate people moving at different speeds
- Good vegetation and route management and maintenance
- Review speed limits and remove highways clutter to enhance the walking and cycling environment
- Create strong gateways to Harlow at the bus and rail stations, and provide access to Harlow Town station from the north
- Encourage active frontages to frame spaces and create natural surveillance
- Join up cycle facilities to create a coherent



Walk-cycle Super Greenway within the urban area alongside carriageway

Walk-cycle Super Greenway wider strategic connections, land anticipated to be required

Indicative extension of Sustainable Transport Corridor

Walk-cycle Super Greenway through open space

Junction Improvements to provide at-grade crossing for all

Manage landscape to open up view and improve overlooking

Open up vehicular link to improve overlooking

Development shaped to improve overlooking and encourage activity

Areas where land requirement is anticipated that is outside the development areas and the highway

Potential Extension

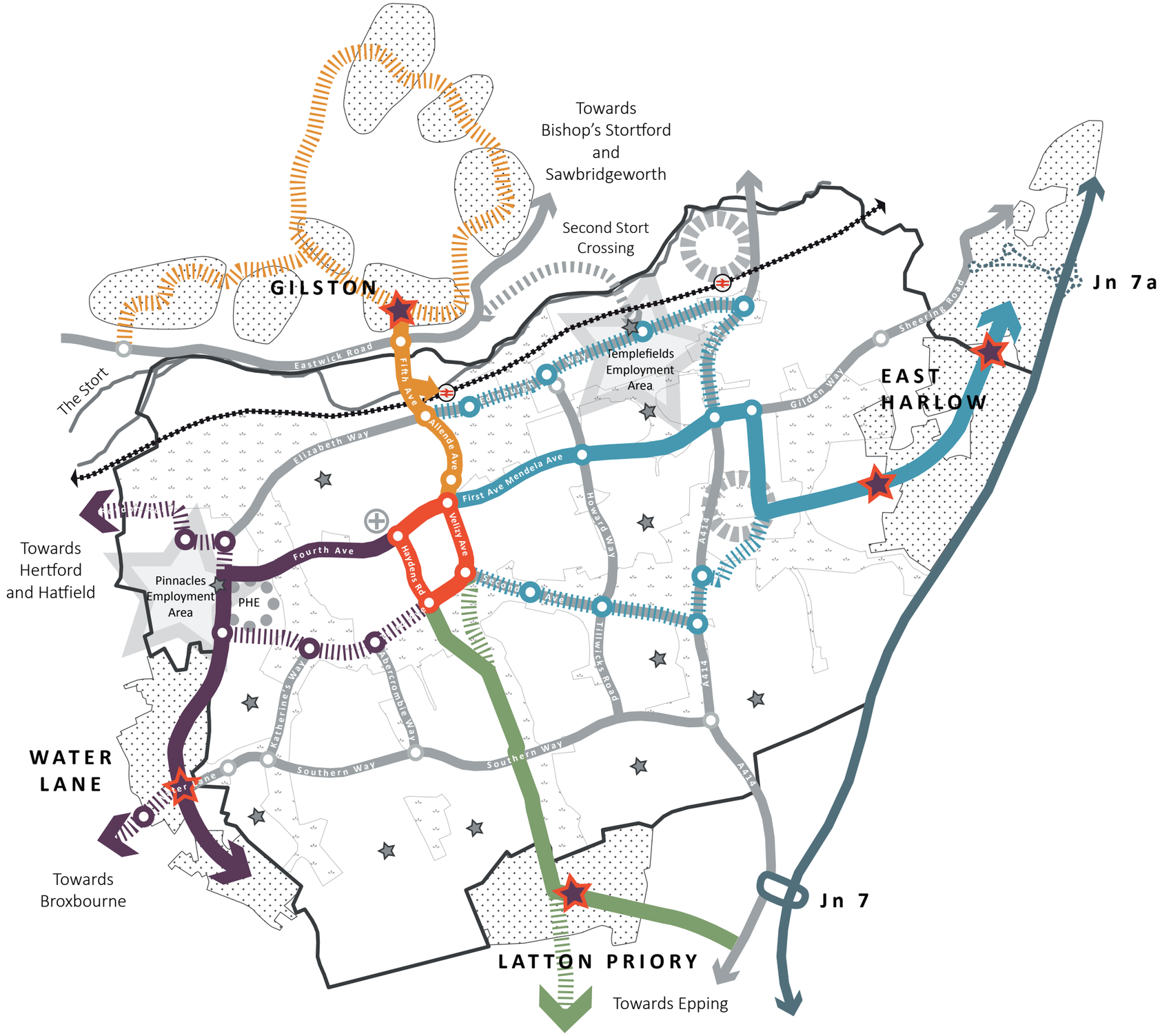
THE CORRIDORS

To ensure these measures can be delivered, four Sustainable Transport Corridors and a Town Centre Interchange have been identified, as shown here.

The Corridors extend from the Town Centre Interchange to the strategic housing sites around Harlow. The Interchange will deliver active travel improvements to this important hub.

Microhubs are locations within the strategic housing sites where additional high quality, seamless interchange facilities should be delivered to encourage people to travel sustainably. These should be co-located with local centres to increase their visibility and community cohesion.

The Corridors are described in detail on the following pages, where a plan and associated table illustrate where and how interventions could be delivered.



Sustainable Transport Corridors

- Corridor 1- North: Town Centre to Gilston
- Corridor 2- South: Town Centre to Latton Priory
- Corridor 3- East: Town Centre to East Harlow
- Corridor 4- West: Town Centre to Water Lane
- Town Centre Interchange
- Microhubs
- Potential Extension

Refer to table on next page

CORRIDOR-WIDE DESIGN PRINCIPLES

In addition to the Corridor-specific interventions outlined on the following pages, the tables on this page set out the *Design Principles* that should be incorporated throughout the Garden Town and broad indicative unit costs.

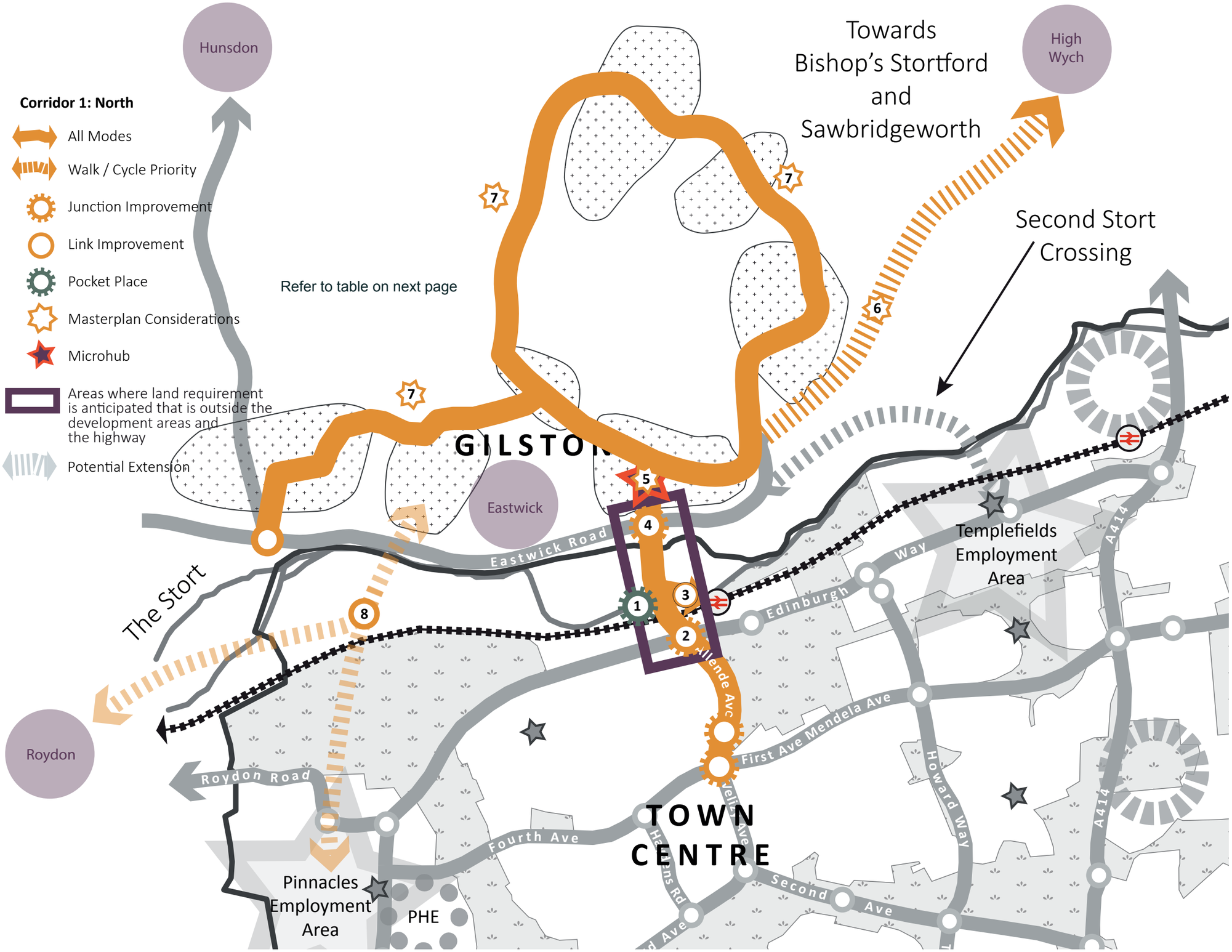
DESIGN PRINCIPLES	INDICATIVE £ PER UNIT
Junction Improvements: • Enable people walking and cycling to cross on direct routes, at grade, on all arms • Where applicable provide an attractive gateway to the town centre • Where applicable provide bus priority and a bus 'greenwave'	
» Small - Pedestrian and Cycle improvements only	£500,000
» Medium - Pedestrians & Cyclists / UTC / Bus Priority	£2,000,000
» Large - Pedestrians & Cyclists / UTC / Bus Priority	£5,000,000
Pocket Places: • Pleasant gateway features at park entrances • Attractive places to stop and rest • Seating arrangements that encourage sociability	
» Small Pocket Places (every 200m)	£40,000
» Large Pocket Places (every 1000m)	£100,000
Bus stops (every 400m) • Provide real time information and WiFi • Have crossing facilities close by • Are well located in residential and employment areas, and other key destinations • Are well overlooked • Provide adequate seating	£10,000
Microhubs (one per strategic site) • Enable seamless interchange between sustainable modes • A facility for 'Kiss and Ride' and car share pick ups • Bike hub facilities including bike repair • Sustainable transport and events information • Taxi drop-off space • Opportunity for additional services such as gym, cafe, online delivery drop-off etc.	£8,000,000

DESIGN PRINCIPLES	INDICATIVE £ PER UNIT
Link Improvements: • Deliver Bus priority through UTC in both directions, and BRT in accordance with the plan on page 22 • Include bus gates where appropriate to ensure bus journey times are shorter to key destinations than for single occupancy cars. • Deliver cycle and walk supergreenways in accordance with the plan on page 23 • Offer a high quality, attractive streetscape • Have regular seating and places to dwell • Are softened with landscape that is well managed and enables views along and into the area to improve overlooking • Improve legibility and wayfinding, and visual connections to key destinations • Deliver new / improved crossing facilities to meet evident and expected desire lines • Provide side-road cross-overs to prioritise walking and cycling • Where appropriate provide formal on-street parking and servicing bays ensuring traffic is not obstructed by parked vehicles	
» Upgrade existing walk / cycle provision to supergreenway	£400 / m
» New walk / cycle supergreenway	£1,200 / m
» Signalised crossings between junctions across dual-carriageway	£200,000
» Signalised crossings between junctions across single carriageway	£125,000
» New bus road in Sustainable Transport Corridors	£1,500 / m
» Bus priority lane	£900 / m

CORRIDOR 1: NORTH - TOWN CENTRE TO GILSTON

With regard to *Sustainable Movement* for Gilston in particular, the Design Guide seeks to ensure that:

- New villages should be integrated into the wider, network of roads and lanes, to avoid these becoming isolated and to ensure a village character informed by a classic village structure
- Attractive, safe and convenient cycling and walking links should be provided between the villages, to the Stort Valley, to the town centre, Harlow Town railway station and employment locations
- New, safe cycling and walking crossings across the A414 should be explored, connecting into Harlow Town Centre and the train station where appropriate
- The Rapid Transit should be accommodated with a STC Microhub (cycle parking and facilities, confluence of walking links, cafe)
- Sustainable travel is integral to serve and support all new villages. Masterplans for new development should support the possible future extension of Sustainable Transport Corridors to wider settlements.



KEY	ADDITIONAL CORRIDOR-SPECIFIC ENHANCEMENTS	INDICATIVE COST OF MEASURE (£)	DELIVERY CONSIDERATIONS (INCL. LAND OWNERSHIP)	APPROVALS	QUICK WIN MEASURE *
1	Pocket Place that: » Promotes walking and cycling to the Stort Valley. Improves visibility of the Stort Valley enabling the River Stort to be a point of unification for the town.	£40,000 - £100,000	Consultation with key River Stort stakeholders e.g. Canal and Rivers Trust	Planning Permission	Yes
2	Junction improvement that: » Improves ease of access to and from the station by all modes	£2,000,000 to £5,000,000	Improvements will require use of land outside development and highway areas		Yes (includes junction improvements south towards town centre)
3	Potential northern access to Harlow Town rail station for people walking and cycling	£6,000,000	Improvements will require use of land outside development and highway areas and liaison with Network Rail	Planning Permission	No
4	Access to the development that provides: » New, safe walking and cycling crossings across the A414 should be explored providing direct access for people walking and cycling to Harlow Town Centre and train station. This could be via a high quality bridge which does not increase direct walk/cycle distances.	£6,000,000	Improvements will require use of land outside development and highway areas		No
5	Micro-hub(s) located in a village centre(s)	£8,000,000	Location of microhub(s) needs to be included in the future masterplan for this area	Planning Permission	No
6	Deliver a strategic cycle connection which connects directly into the walk/cycle supergreenway and extends north beyond the development areas and into the surrounding rural highways towards Bishop's Stortford. Additionally, new developments should support the possible future extension of Sustainable Transport Corridors to other wider settlements	£4,400,000	Requires review as part of Local Cycling and Walking Infrastructure Plan. Masterplans should support the possible future extension of Sustainable Transport Corridors to wider settlements		No
7	Link between villages to include BRT and Walk-Cycle Supergreenway to include: » Adequate carriageway for two-way buses » New houses approximately 10 minute walk of BRT » Walk-cycle Supergreenway » Wayfinding and regular seating	£1,500 / m £400 / m	Masterplan consideration for route and design		No
8	Potential new links to Pinnacles Employment Area and Roydon Station » Walk-cycle Supergreenway	£1,200 / m	Masterplan consideration for route and design	Planning Permission	No

*Quick win = measure that should be implemented as a matter of priority to benefit the existing community and ensure infrastructure is in place when new developments become occupied.

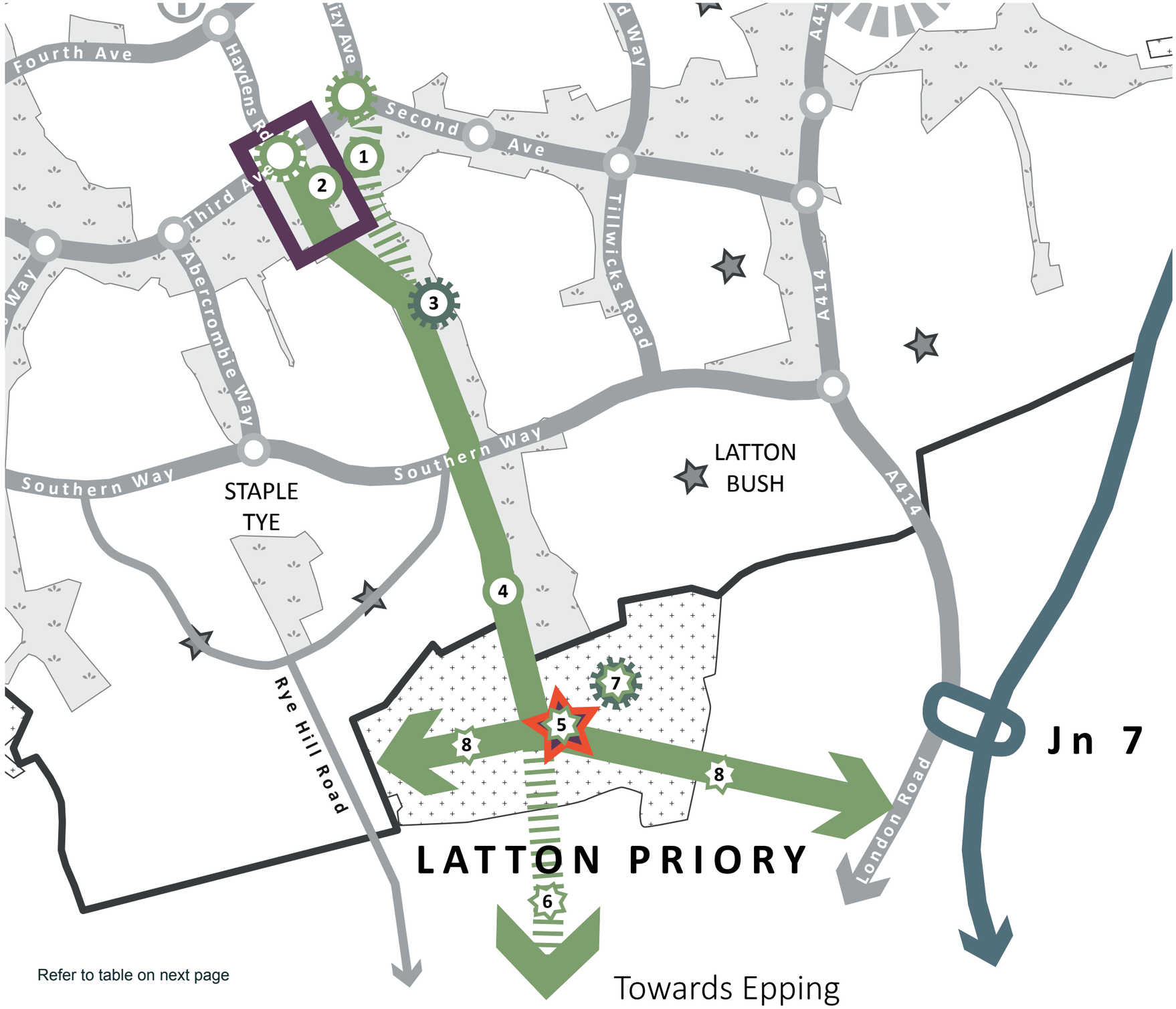
CORRIDOR 2: SOUTH - TOWN CENTRE TO LATTON PRIORY

With regard to *Sustainable Movement* in particular, the Design Guide seeks to ensure that:

- The neighbourhood should be well connected for cyclists, pedestrians and cars with Rye Hill Road and London Road
- The community should integrate with existing neighbourhoods of Staple Tye and Latton Bush. Extending Fern Hill Road and Riddings Lane
- The Rapid Transit should be accommodated, with an STC Microhub (cycle parking and facilities, confluence of walking links, cafe) in the neighbourhood centre
- Attractive and safe cycle links should be provided onto Epping and connecting into surrounding bridleways.
- Consideration should be given to a potential future extension of the Rapid Transit onto Epping - designs should not preclude this from happening.

Corridor 2: South

- All Modes
- Walk / Cycle Priority
- Junction Improvement
- Link Improvement
- Pocket Place
- Masterplan Considerations
- Microhub
- Areas where land requirement is anticipated that is outside the development areas and the highway

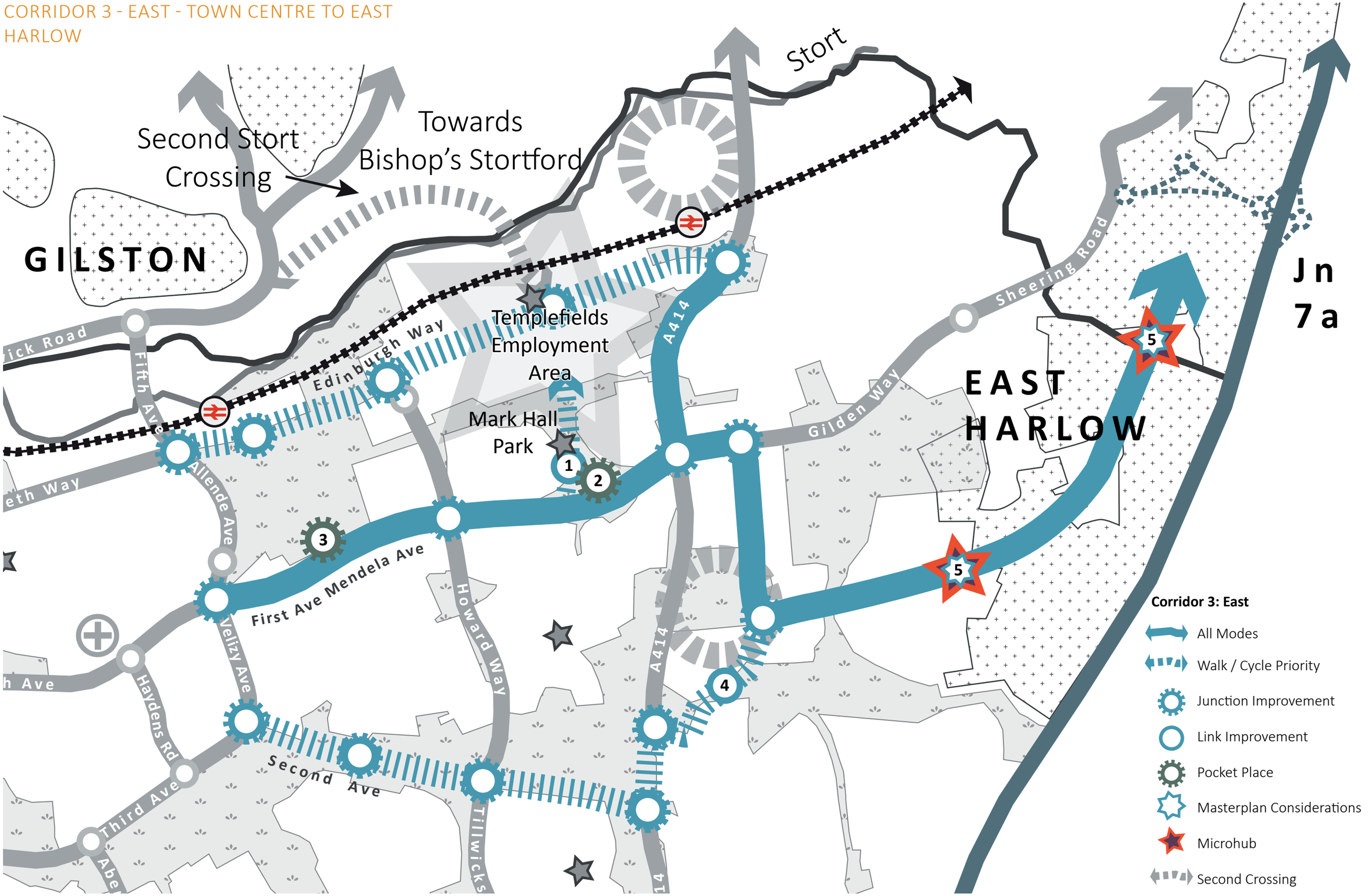


Refer to table on next page

Towards Epping

KEY	ADDITIONAL CORRIDOR-SPECIFIC ENHANCEMENTS	COST OF MEASURE (£)	DELIVERY CONSIDERATIONS (INCL. LAND OWNERSHIP)	APPROVALS	QUICK WIN MEASURE *
1	Existing walk/cycle link upgraded to cycle/walk super-greenway	£400 / m	Improvements will require use of land outside development and highway areas		No
2	Bus/shared transport link that: » Provides bus priority with a new tarmaced link heading south from the Haydens Road roundabout through greenspace (precise alignment to be determined) » Runs in part along existing estate roads to pick up passengers along the route and build in resilience » Has a new walk/cycle connection provided along side it connecting into the Haydens Road junction » Wayfinding	£1,500 / m £1,200 / m	Improvements will require use of land outside development and highway areas		No
3	Pocket Places: » Provided at regular intervals along walk/cycle supergreenway » Provided where access is good from existing residential areas » Points of interaction and activity in green wedge	£40,000 to £100,000	None		No
4	New link and bus gate: » Bus gate into the development to ensure buses have an advantage over cars in terms of journey times and also to discourage rat-running » Adequate carriageway width for two-way buses » Cycle / walk supergreenway » Wayfinding and regular seating	£1,650,000 £1,500 / m £400 / m	Masterplan consideration		No
5	Micro-hub(s) » To be points of interaction and interchange - possibly located in hatches / neighbourhood centres and could include cycle parking/hire, bike/park and ride, concierge facilities, confluence of walking links, café etc.	£8,000,000	Location and facilities of microhub(s) needs to be included in the future masterplan for this area	Planning Permission	No
6	Deliver a strategic cycle connection which connects directly into the cycle/ walk supergreenway and extends south through the fields/along quiet roads, onto Epping. Additionally, new developments should support the possible future extension of Sustainable Transport Corridors to other wider settlements.	£2,700,000	Requires review as part of Local Cycling and Walking Infrastructure Plan Masterplans should support the possible future extension of Sustainable Transport Corridors (including BRT) to wider settlements e.g. Epping and designs should consider this.		No
7	Small new Town Park destination space	£40,000 to £100,000	None		No
8	New east/west route linking new development to include: » Adequate carriageway width for two-way buses » New houses approximately 10 minute walk of BRT » Walk/cycle supergreenway » Wayfinding and regular seating » Onward link east of the site to B1393 London Road	£1,500 / m £400 / m	Masterplan consideration (including safeguarding of link to B1393 London Road)		No

*Quick win = measure that should be implemented as a matter of priority to benefit the existing community and ensure infrastructure is in place when new developments become occupied.


Second Stort Crossing
Towards Bishop's Stortford
Stort
GILSTON
Templefields Employment Area
Mark Hall Park
EAST HARLOW
Jn 7a
Sheering Road
Edinburgh Way
A414
Gilden Way
Fifth Ave
Allende Ave
First Ave Mendela Ave
Velizy Ave
Howard Way
Haydens Rd
Third Ave
Second Ave
Tillwicks
1
2
3
4
5
Corridor 3: East
All Modes
Walk / Cycle Priority
Junction Improvement
Link Improvement
Pocket Place
Masterplan Considerations
Microhub
Second Crossing

KEY	ADDITIONAL CORRIDOR-SPECIFIC ENHANCEMENTS	COST OF MEASURE (£)	DELIVERY CONSIDERATIONS (INCL. LAND OWNERSHIP)	APPROVALS	QUICK WIN MEASURE *
1	Upgrade to walk/cycle super greenway to create improved walk-cycle connection to Temple Fields through Mark Hall Park	£400 / m	None		Yes
2	Key Pocket Place enhancement at Mark Hall Park	£40,000 to £100,000	None		Yes
3	Pocket Place at the entrance to the park which increases its prominence and visibility	£40,000 to £100,000	None		Yes
4	New walk/cycle link to supergreenway standard	£1,200 / m	None		Yes
5	Micro-hub(s) » To be points of interaction and interchange - possibly located in hatches / neighbourhood centres and could include cycle parking/hire, bike/park and ride, concierge facilities, confluence of walking links, café etc.	£8,000,000	Location and facilities of microhub(s) needs to be included in the future masterplan for this area	Planning Permission	No

*Quick win = measure that should be implemented as a matter of priority to benefit the existing community and ensure infrastructure is in place when new developments become occupied.

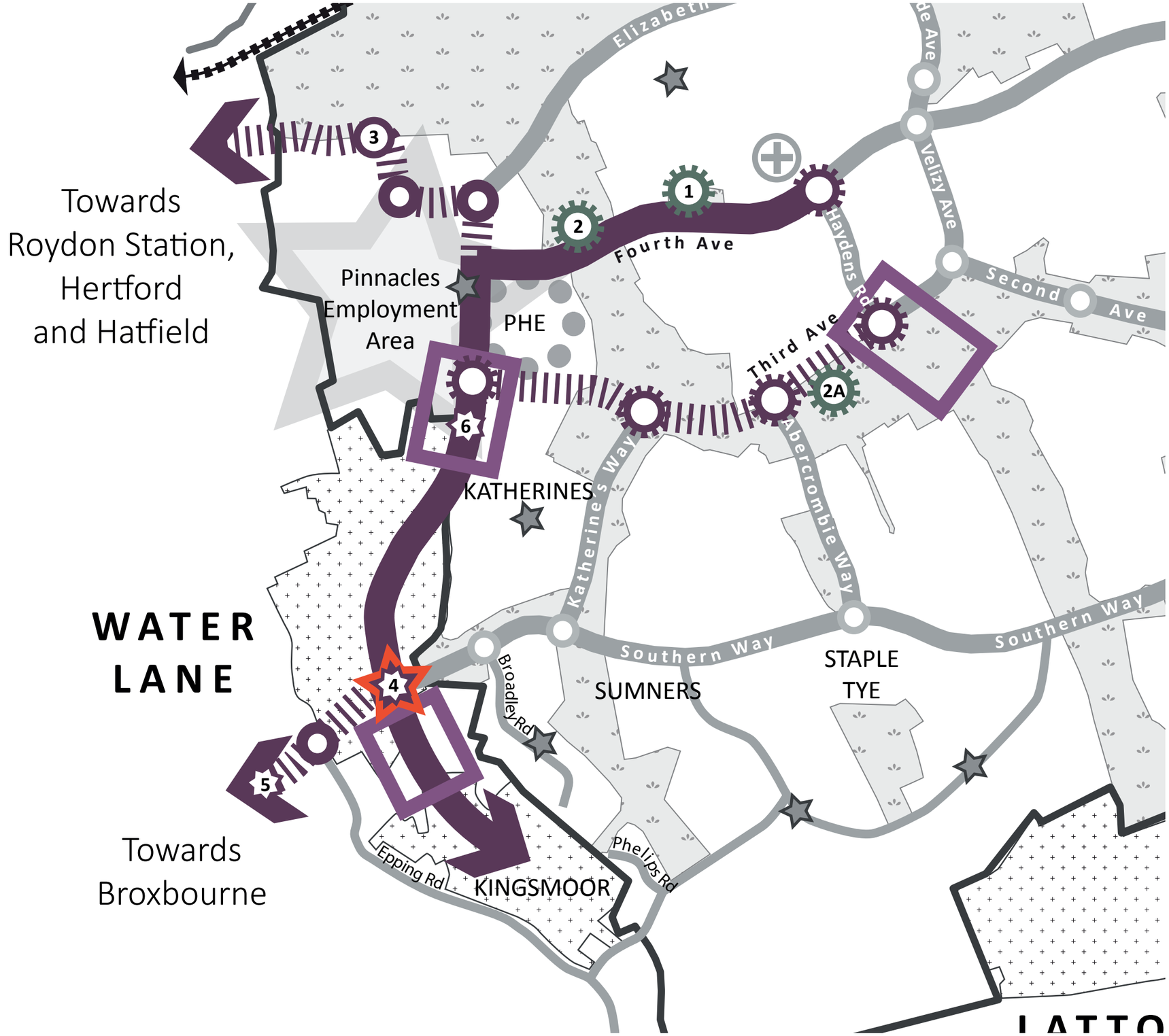
CORRIDOR 4 - WEST - TOWN CENTRE TO WATER LANE

With regard to *Sustainable Movement* in particular, the Spatial Vision and Design Charter seeks to ensure that:

- The neighbourhoods should be well connected for cycles, pedestrians and cars with PHE and Pinnacles to the north.
- The communities should integrate with existing neighbourhoods at Katherines, Sumners and Kingsmoor. Broadley Road and Phelips Road could provide a good local links.
- The Rapid Transit should be accommodated along Water Lane and/or connected south from Pinnacles roundabout.
- Attractive and safe cycle links should be made into the town centre, north to Roydon station and west to Broxbourne station and the Upper Lee Valley.

Corridor 4: West

- All Modes
- Walk / Cycle Priority
- Junction Improvement
- Link Improvement
- Pocket Place
- Masterplan Considerations
- Microhub
- Areas where land requirement is anticipated that is outside the development areas and the highway

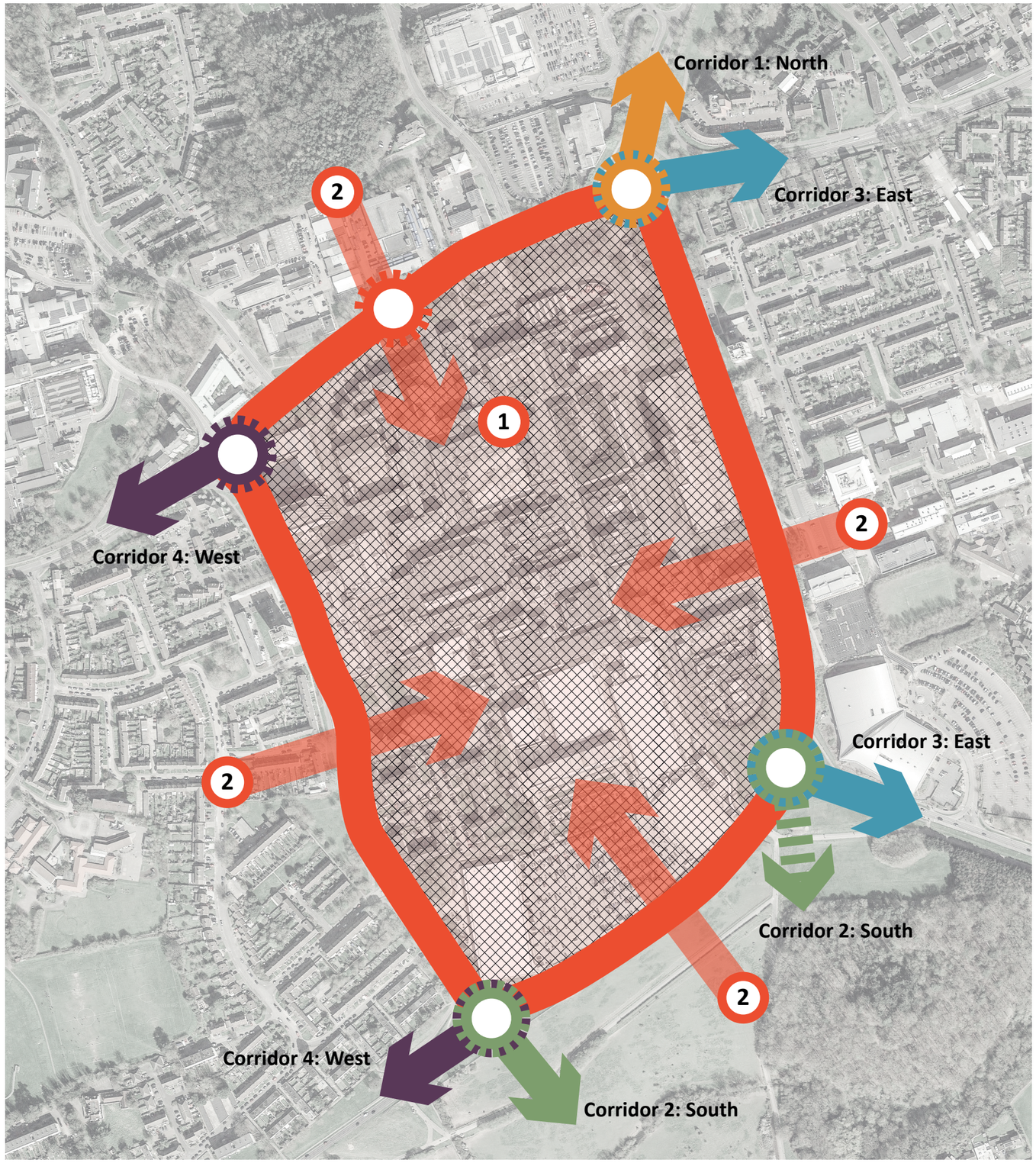


KEY	ADDITIONAL CORRIDOR-SPECIFIC ENHANCEMENTS	COST OF MEASURE (£)	DELIVERY CONSIDERATIONS (INCL. LAND OWNERSHIP)	APPROVALS	QUICK WIN MEASURE *
1&2 &2A	Pocket Place opportunity: » Provided at regular intervals along walk/cycle supergreenway (one adjacent to Canons Brook) » Provided where access is good from existing residential areas » Points of interaction and activity in green wedge	£40,000 to £100,000	None		No
3	Provide enhanced walking / cycling link to Roydon Station	£400 / m	Requires review as part of Local Cycling and Walking Infrastructure Plan		No
4	Micro-hub(s) » To be points of interaction and interchange - possibly located in hatches / neighbourhood centres and could include cycle parking/hire, bike/park and ride, concierge facilities, confluence of walking links, café etc.	£8,000,000	Location and facilities of microhub(s) needs to be included in the future masterplan for this area	Planning Permission	No
5	Strategic cycle link to the Lea Valley and Broxborne either segregated adjacent to PROW or highways or along very quiet lanes where vehicle access can be limited. Additionally, new developments should deliver locally focussed sustainable transport infrastructure, as well as support the possible future extension of Sustainable Transport Corridors to other wider settlements.	£400 / m	Requires review as part of Local Cycling and Walking Infrastructure Plan Masterplans should support the possible future extension of Sustainable Transport Corridors (including BRT) to wider settlements e.g. Epping and designs should consider this.		No
6	New north/south route linking new development with Pinnacles and town centre. Could include: » Junction improvement at Elizabeth Way/Third Ave roundabout » Bus gate into the development to ensure buses have an advantage over cars in terms of journey times and also to discourage rat-running. » Adequate carriageway width for two-way buses » New houses approximately 10 minutes walk of BRT » Cycle / walk supergreenway » Wayfinding and regular seating	£1,650,000 £1,500 / m £400 / m	Improvement at northern junction (GSK) will require use of land outside development and highway areas. Masterplan consideration.	Planning Permission	No

*Quick win = measure that should be implemented as a matter of priority to benefit the existing community and ensure infrastructure is in place when new developments become occupied.

INTERCHANGE - TOWN CENTRE

This Sustainable Transport Corridors Study has identified and recommended these town centre routes as optimum for the objectives of the study. In addition, the recommended location of the bus interchange is the most suitable and deliverable in highway terms. It should be noted, however, that during 2018 Harlow Council is carrying out an Issues and Options consultation for the preparation of a Harlow Town Centre Area Action Plan, which identifies these options for the town centre routes and bus interchange as well as an alternative route and interchange location. In the event that through that piece of work it is concluded that for regeneration and placemaking reasons, the alternative option identified is the preferred option, then further transport technical work will need to be undertaken and the recommended route set out in this report would need to be revisited and revised.



Town Centre Interchange

All Modes

Walk / Cycle Priority

Junction Improvement

KEY	ADDITIONAL CORRIDOR-SPECIFIC ENHANCEMENTS	COST OF MEASURE (£)	DELIVERY CONSIDERATIONS (INCL. LAND OWNERSHIP)	APPROVALS	QUICK WIN MEASURE *
1	Suggested new location for bus interchange to: » Enhance quality » Accommodate growth » Facilitate crosstown bus services » Make provision for charging electric buses » Facility needs to be very close to the retail core with a high quality public realm connection to it and good wayfinding	£8,000,000	Bus interchange needs to be located close to the retail core		No
2	All town centre access points for people walking, cycling and using public transport need to be more attractive than using a car: » Walk-cycle super greenways need to plug directly into the town centre along attractive direct routes that are overlooked, have good wayfinding, connect into the bus interchange and lead to areas of cycle parking » Improved bus interchange needs to be very close to the retail core with a high quality public realm connection to it and good wayfinding.	£400 / m	Some junction improvements will require use of land outside development and highway areas		No
	Junction improvements to deliver: » Easy and direct crossing facilities for people of all ages and abilities walking and cycling - at grade. » An attractive gateway to the town centre » Bus priority UTC ‘ green wave’	Included in Corridors 1, 2, 3 or 4			
	Link improvements to deliver: » Continuous, connected walking and cycling facilities. » At grade crossing places where there is demand. The AAP may influence where these locations are. » Effective bus priority through the town centre to provide north/ south and east / west bus priority corridors. North /south bus priority could be on either Velizy Avenue or Haydens Road and needs to connect directly into the bus interchange. East / west bus priority should be along Fourth Avenue or parallel route close to the northern end of the town and also needs to connect directly into the bus interchange. » Streetscape enhancements (decluttering, comprehensive landscape treatment, humanising) » Wayfinding	Included in Corridors 1, 2, 3 or 4			

*Quick win = measure that should be implemented as a matter of priority to benefit the existing community and ensure infrastructure is in place when new developments become occupied.

Improving bus services, frequencies and waiting facilities will be key to encouraging sustainable travel from door-to-door.

5 | Door to Door Strategy

DOOR TO DOOR STRATEGY

The second facet of the Sustainable Transport Corridors Strategy addresses door to door journeys. These should primarily be made by walking, cycling and/or public transport. This aspect addresses the wider street, walking and cycling and local bus service networks within the Garden Town, thereby ensuring that people can travel from 'door to door' sustainably. The key components of this approach are to connect to the Sustainable Transport Corridors and:

- Ensure the existing street network is attractive for walking and cycling
- Revitalise the town's existing walking and cycling network
- Filling in key missing links in the towns existing cycling and walking network
- Provide connections to the cycle-walk super-greenways
- Reduce severance
- Deliver streets in the new development that are attractive for and support walking and cycling
- Deliver new wayfinding and signage
- Provide cross town bus services with coordinated timetables

To address these components there are three key strands;

1. Streets and connections
2. Local bus network
3. Demand responsive transport

The approach to these strands is set out on the following pages.

To encourage people to travel sustainably door-to-door, walking and cycling routes need to be well overlooked and maintained, and crossing points require consistent application of tactile paving and dropped kerbs throughout the Garden Town.

1. STREETS AND CONNECTIONS

The map illustrates the following street types:

RESIDENTIAL STREETS

- People of all ages and abilities feel safe and enjoy walking and cycling and in some areas playing in these streets
- People walking and cycling can take direct routes
- Streetscape is attractive
- There is regular seating
- Pocket Places on or beside streets provide variety and delight, aid legibility and navigation and encourage people to stop and chat or just sit in the sun
- Speed limits are no higher than 20mph and are self enforcing
- There are clear gateways into residential areas which slow traffic and prioritise people walking and cycling or using other slow modes
- Parking is designed in effectively and does not cause an obstruction to people walking and cycling
- Streets and links are overlooked

EMPLOYMENT STREETS / A414 CORRIDOR

- Streets feel safe for all walking and cycling
- People walking and cycling can take direct routes
- Speed limits are no higher than 30mph where there is significant demand for walking and cycling
- Streetscape is simple and feels well looked after
- Crossing facilities are available where required that can be used by all

LOCAL DISTRIBUTOR STREETS

A number of these streets form part of the sustainable transport corridors and more detail on what is required in those corridors has been provided earlier in this report. On other key streets, which can represent barriers to walking and cycling, the following characteristics are needed:

- Raising the priority of pedestrians and cyclists through provision of regular crossing facilities to ensure these streets are not a barrier to walking and cycling, or use of public transport.
- Bus stops located near crossing facilities
- Attractive streetscape
- Regular seating
- Speed limits no higher than 30 mph where there is significant demand for walking and cycling

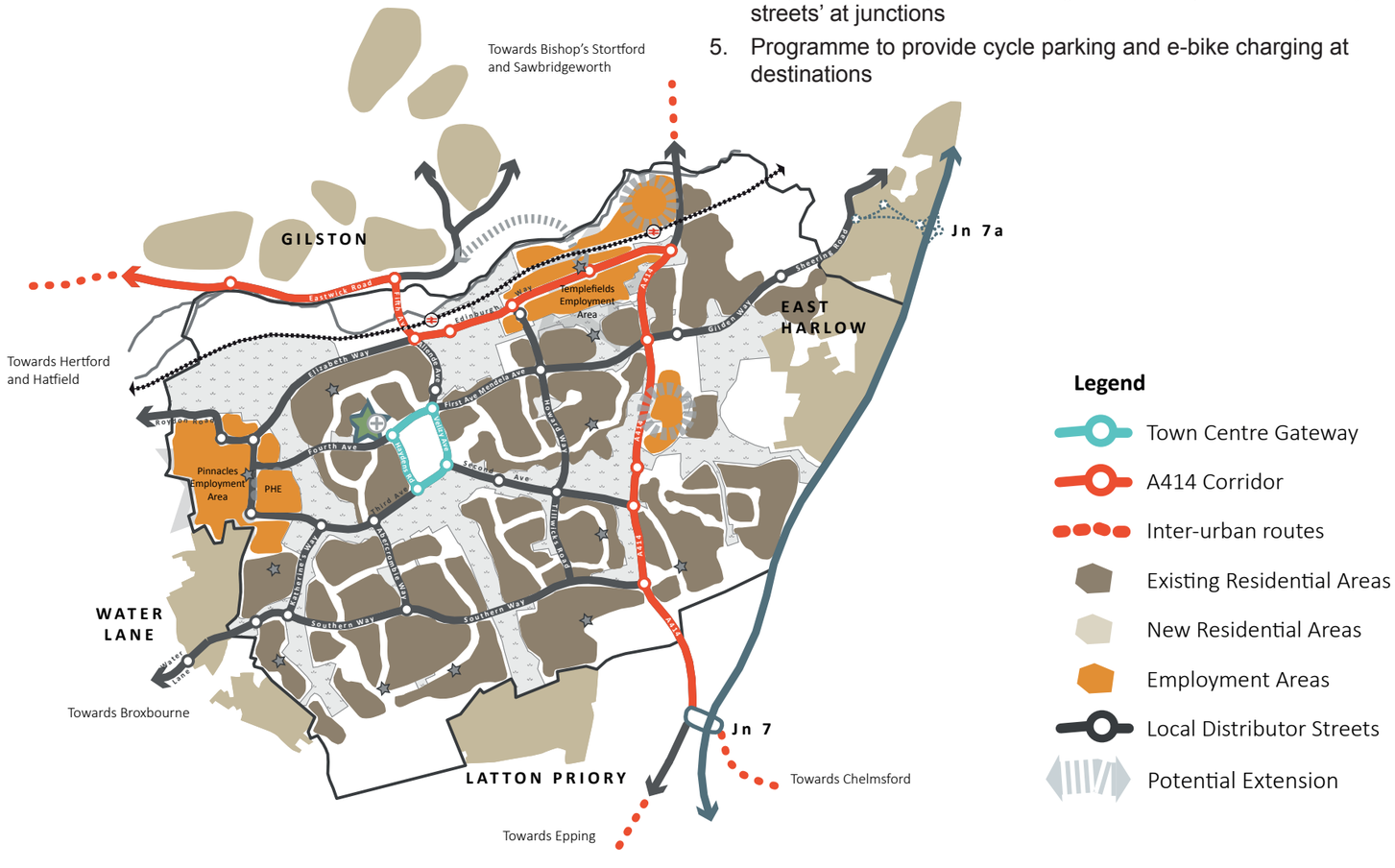
LOCAL CENTRES - HATCHES

- Good public realm
- Cycle parking is provided close to the retail and services provided
- Bus stops are located close to the the centre
- Speed limits are no more than 20 mph

The streets in the areas of new development should be designed to achieve all these characteristics.

Within existing streets a number of programmes will need to be developed to work towards this. These are listed below;

1. Speed management / limit programme including 20mph zones for residential areas
2. Programme of gateway/entry treatments into residential areas.
3. Programme to identify and address key gaps in the walking and cycling networks
4. Programme to improve crossing facilities in particular on ‘key streets’ at junctions
5. Programme to provide cycle parking and e-bike charging at destinations



2. LOCAL BUS NETWORK

The local bus network provides a critical service but at the moment there are limited cross town services, complex routing and quality is variable. Facilities such as real time information and smart ticketing are limited.

Some parts of the network are relatively high frequency (serving the areas of Bush Fair, Staple Tye, Todd Brook and Harlow Common) and these areas have higher bus mode share to work.

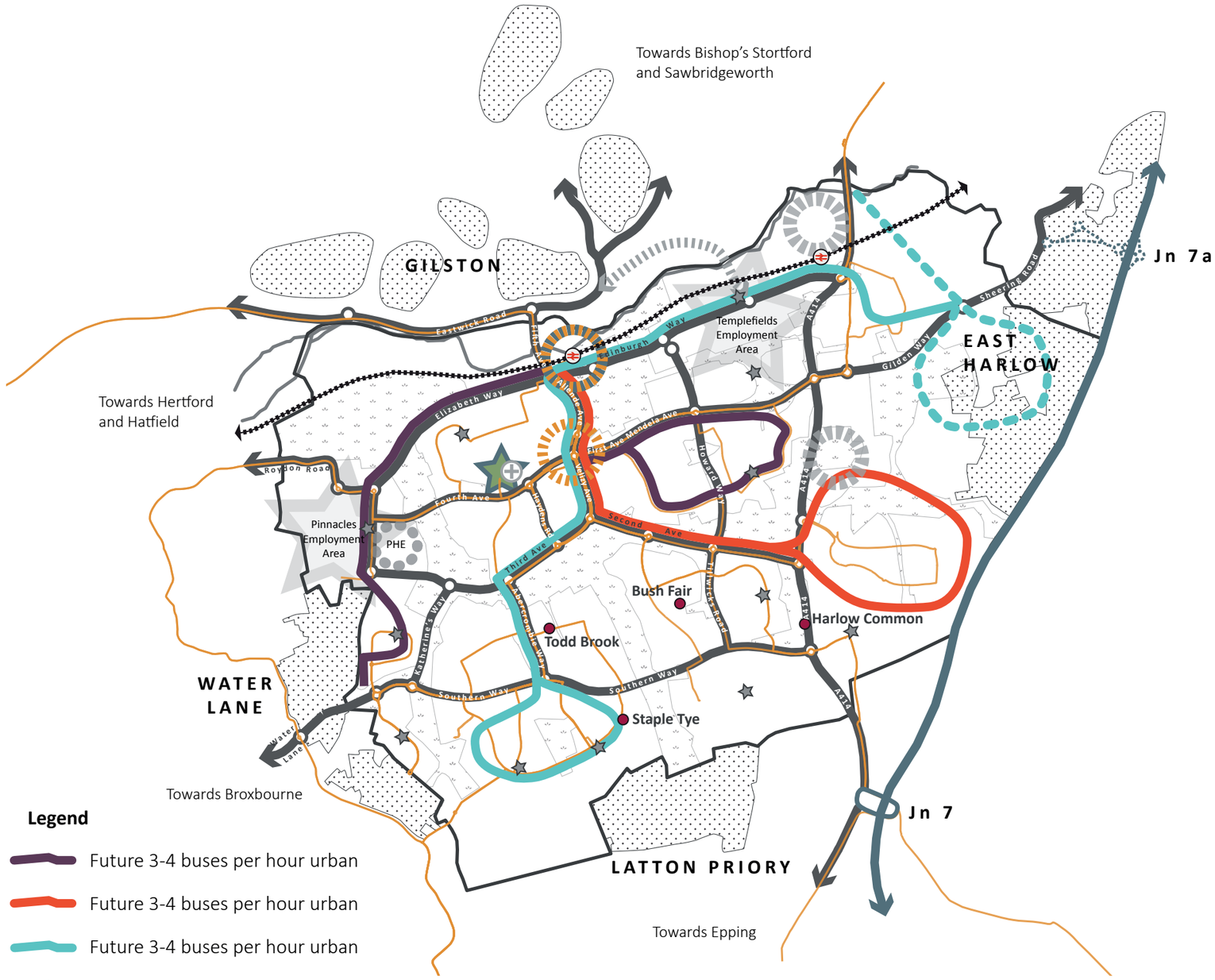
It is proposed that the local bus networks are reviewed in the light of the proposals for BRT. This will also enable specific consideration to be given to the implications of moving the hospital, the major investment being made by Public Health England and the Enterprise Zone on the local bus network.

CROSS TOWN SERVICES

The cross town services would be a recognisably different offer to the BRT and would include:

- A network of simplified cross-town services
- Timetables that are aligned so that interchange in the town centre is easier
- Working to improve the quality of the buses and facilities

The key first step needed to deliver this approach is to commence partnership working with the bus operators. Long terms goals in terms of public /shared transport quality and mode share need to be agreed and coordinated programmes of investment planned through a mechanism such as a bus quality partnership.



3. DEMAND RESPONSIVE SERVICES

Currently, existing shared demand-responsive services like Dial-a-Ride often provide a subsidised service for rural areas or for people who can't use buses easily. These services often require booking in advance and in some cases also only provide journeys during the day. However, the development of technology which allows easy booking, tracking of vehicles and optimisation of routes is anticipated to lead to the expansion of commercial on demand shared transport including that which requires limited forward planning.

In Harlow the provision of on demand shared services would provide an important service that could infill the gaps in timetabled bus services in terms of both the times and geography of operation. These services as they emerge will need to be recognised as a valuable part of the public transport offer and enabled to use the bus priority and other facilities for public transport.

Arriva who are the main bus operator in Harlow are trialling a service called Arriva Click in Kent.

Based on their experience in Sittingbourne, Arriva consider that the presence of a major hospital and more leisure services would be an ideal model location for ArrivaClick. Given the characteristics of Harlow and the ambitions of the Harlow and Gilston Garden Town, the delivery of a similar trial should be explored in Harlow in parallel to the delivery of revised routes for crosstown bus services and BRT.

ARRIVACLICK

ArrivaClick is an Uber-style bus service enabling people to order a minibus via a mobile phone app. Bus passenger who use the on-demand ArrivaClick service determine the route by entering their pick-up point and destination and the technology matches people travelling in the same direction. The app allows people to track their chosen vehicle, tell them the name of the driver, reserve a seat and pay for the journey. Journeys are priced by the mile. The starting price being £1 per mile; making it up to 75% cheaper than taxi fares but also, for shorter journeys, cheaper than a single bus fare.

ArrivaClick was launched in Sittingbourne in Kent in March 2017; the location includes the key employment site of Kent Science Park. After one year ArrivaClick has achieved the following:

- The equivalent of 12% of Sittingbourne's population have downloaded the app.
- 61% of ArrivaClick customers use the service a few times a week or more, with just under half (43%) adopting the service for their daily commute.
- One third (34%) of customers used the service for leisure trips, while just over three in ten (31%) used ArrivaClick to visit friends and relatives.
- More than half (52%) of customers switched from private motor transport, including taxis (22%) driving their own car (18%) or being a passenger in a car (12%).
- Almost nine in ten (8.9/10) customers would recommend using the service to a friend

Following the trial in Sittingbourne, ArrivaClick will be launched in Liverpool in late Summer 2018.

[https://news.arriva.co.uk/news/arrivas-on-demand-public-transport-service-a-success]

CONCLUSIONS

1. STREETS AND CONNECTIONS

MEASURE	QUICK WIN?
Speed management / limit programme including 20mph zones for existing residential areas	Yes
Programme of gateway/entry treatments into existing residential areas	Yes
Programme to identify and address key gaps in the walking and cycling networks	Yes
Programme to improve crossing facilities in particular on 'key streets' at junctions	Yes
Programme to provide cycle parking and e-bike charging at destinations	Yes
Through masterplanning the new communities at **Water Lane** should adopt the overall 'Door to Door' approach. Specifically, the new communities should integrate with existing neighbourhoods at Katherines, Sumners and Kingsmoor. Broadley Road and Phelips Road could provide a good local links.	No
Through masterplanning the new **Gilston Villages** should adopt the overall 'Door to Door' approach. Specifically, the new Gilston villages should be integrated into the wider, organic network of lanes, to avoid these becoming isolated and to ensure a village character informed by a classic village structure. Specifically, the new communities should be well connected for cyclists, pedestrians and public transport users to Harlow Town Centre and the train station.	No
Through masterplanning the new communities at **East Harlow** should adopt the overall 'Door to Door' approach. Safe and attractive cycle links should be provided through the neighbourhoods to the nearby Enterprise Zone.	No
Through masterplanning the new communities at **Latton Priory** should adopt the overall 'Door to Door' approach. Specifically, the new communities should be well connected for cyclists, pedestrians and cars with Rye Hill Road and London Road. The community should integrate with existing neighbourhoods at Staple Tye and Latton Bush. Extending Fern Hill Lane and Riddings Lane would provide good links.	No

2. LOCAL BUS NETWORK

MEASURE	QUICK WIN?
Establish partnership working arrangements with bus operators and other transport providers for investment planning and data sharing purposes	Yes
Agree long terms goals in terms of public /shared transport quality and mode share	Yes
Agree a coordinated programme of investment planned through a mechanism such as a bus quality partnership	Yes

3. DEMAND RESPONSIVE SERVICES

MEASURE	QUICK WIN?
Investigate delivery of a trial service such as 'Arriva Click'	Yes

Quick Wins are measures that should be implemented as a matter of priority to benefit the existing community and ensure measures are in place when new developments become occupied.

6 | Changing Hearts and Minds & Partnership Working

CHANGING HEARTS AND MINDS AND PARTNERSHIP WORKING

Sections 4 and 5 of this report outline the infrastructure improvements needed to achieve the objectives of the Sustainable Transport Corridors Strategy. Providing and improving infrastructure is only one element of the approach needed to significantly increase the number of people using sustainable modes of transport. Programmes which reduce the need to travel and encourage and facilitate people to use sustainable modes along with working in partnership with local transport providers, major employers and schools etc. will be critical. Therefore, alongside these infrastructure improvements, a behaviour change tier focused on changing hearts and minds is key to achieving the transformational change envisioned.

Behaviour change campaigns have traditionally focused on:

- Dedicated people working with businesses - to set up workplace travel plans, promote tele-conferencing and encourage more flexible working patterns;
- A rolling programme of personalised travel planning, targeting approximately 5,000 people each year, probably neighbourhood by neighbourhood, increasing the number of walking, cycling and bus trips.
- A rolling programme to develop school travel plans, including 'safe routes' infrastructure such as cycle tracks, zebra crossings and speed management measures, covering every school in the area over 10 years.
- A partnership with local bus and rail operators to market public transport improvements to local people.
- A broader travel awareness campaign, underpinning the more targeted initiatives.
- A series of smaller projects, such as establishing an authority-wide bike share and car share schemes.
- Community-led initiatives, such as street closures, to allow residents to explore new uses for existing spaces.

However, the area of travel behaviour change is evolving rapidly with the introduction of technology, data sharing, apps and online communication. The long term trajectory is towards 'Mobility as a Service' or 'MaaS'. MaaS recognises the increasing influence of mobile data, real-time information, and associated 'apps' on the way people make decisions about travel and the opportunity this interface offers transport (and non-transport) organisations to promote additional services. A basic example is e.g. when an individual searches for the best way to travel from point A to point B then they are also offered the opportunity to buy their ticket for the journey or pay for their parking. In the longer term, MaaS will be influencing residents and employees in the Garden Town and therefore should be a key consideration for the new development sites.

Delivering this 'Changing Hearts and Minds' Tier in Harlow and Gilston with a view to build towards MaaS could become part of a wider longer term vision and pilot for building towards the concept of Mobility as a Service (MaaS) across Essex and Hertfordshire.

The ultimate goal of MaaS is that residents/employees subscribe to a town-wide service that allows easy access to information on public transport, car sharing and bike sharing through a universal payment system accessed through an app on smartphones.

MAAS IN THE WEST MIDLANDS

Transport for the West Midlands and Whim are currently pioneering a new MaaS scheme in the West Midlands including services provided by Gett taxis, National Express buses, Midland Metro trams, and shortly local train services, city bikes, rental cars and car club vehicles. Customers will have a choice of either pay-per-ride or monthly subscription where customers pre-purchase 'mobility packages' that provides the ability for a customer to consume mobility across all providers participating in the scheme up to set limits – a certain amount of travel by taxi, a certain amount of travel by bus, etc. Launched in April 2015, Whim offers three payments options via mobile phones

- Pay as you go
- Whim Everyday for £99 per month which includes unlimited public transport with taxis and best-price car hire;
- Whim Unlimited for £349 per month which includes unlimited public transport, all taxi rides within a three-mile radius of your location and up to 30 days car hire per month

Small and intentional steps need to be taken now to ensure that the Garden Town is ready to capitalise on the potential of MaaS and its impacts on future mobility. Therefore, the following measures are proposed

QUICK WINS

MEASURE 1: PLANNING FOR AND ONGOING PRIORITISATION OF TRAVEL OPTIONS & NEW TECHNOLOGIES IN NEW AND EXISTING DEVELOPMENTS (ALSO SEE TIER 1 SUSTAINABLE TRANSPORT CORRIDORS AND TIER 2 DOOR TO DOOR STRATEGY)

For MaaS to function, customers require travel options. Without options, the need for MaaS diminishes as a journey cannot be 'optimised' and the private car remains the only choice.

Tier 1 and Tier 2 include the implementation of travel options in existing and new developments. It is important to plan and prioritise for a garden town that is increasingly multi-modal, including the consideration of connected and autonomous vehicle infrastructure needs in key developments. The following infrastructure considerations have been made as part of Tier 1 and Tier 2:

- Walking
- Cycling
- Shared bikes
- Electric bikes
- Public transport
- Car sharing
- Car clubs
- Demand responsive transport e.g. role of Uber or bus ArrivaClick
- Electric Vehicles
- Connected and autonomous vehicles (CAVs) e.g. provision of infrastructure to assist with implementation of the next generation of autonomous vehicles. This could include possible utilisation of segregated routes and provision of infrastructure for communications and operation of CAVs;

- Home working e.g. access to high speed broadband both at home and in communal work hubs to encourage more community based working. This could include a Communal Work Hub that provides work space, meeting areas and support facilities to enable home or community working, reducing commuter travel and fostering a local business community atmosphere;
- Freight e.g. planning for a Micro Consolidation Centre could take receipt of home deliveries for the Harlow and Gilston Garden Town and arrange for their onward delivery by simple and sustainable means. This provides significant efficiency relating to the last mile of travel. Cargo bikes can act as an effective solution to last mile deliveries; cargo-bikes are able to carry payloads of up to 250kg. They are particularly effective in compact and congested towns and cities, as well as being emission-free. Cargo bikes can also be adapted to use electric-assist technology for further vehicle power.

Technology is also key to MaaS. Many users of MaaS will 'bring their own device'. However, to be inclusive, on-street displays can extend the reach of technology. Such dispalys could include:

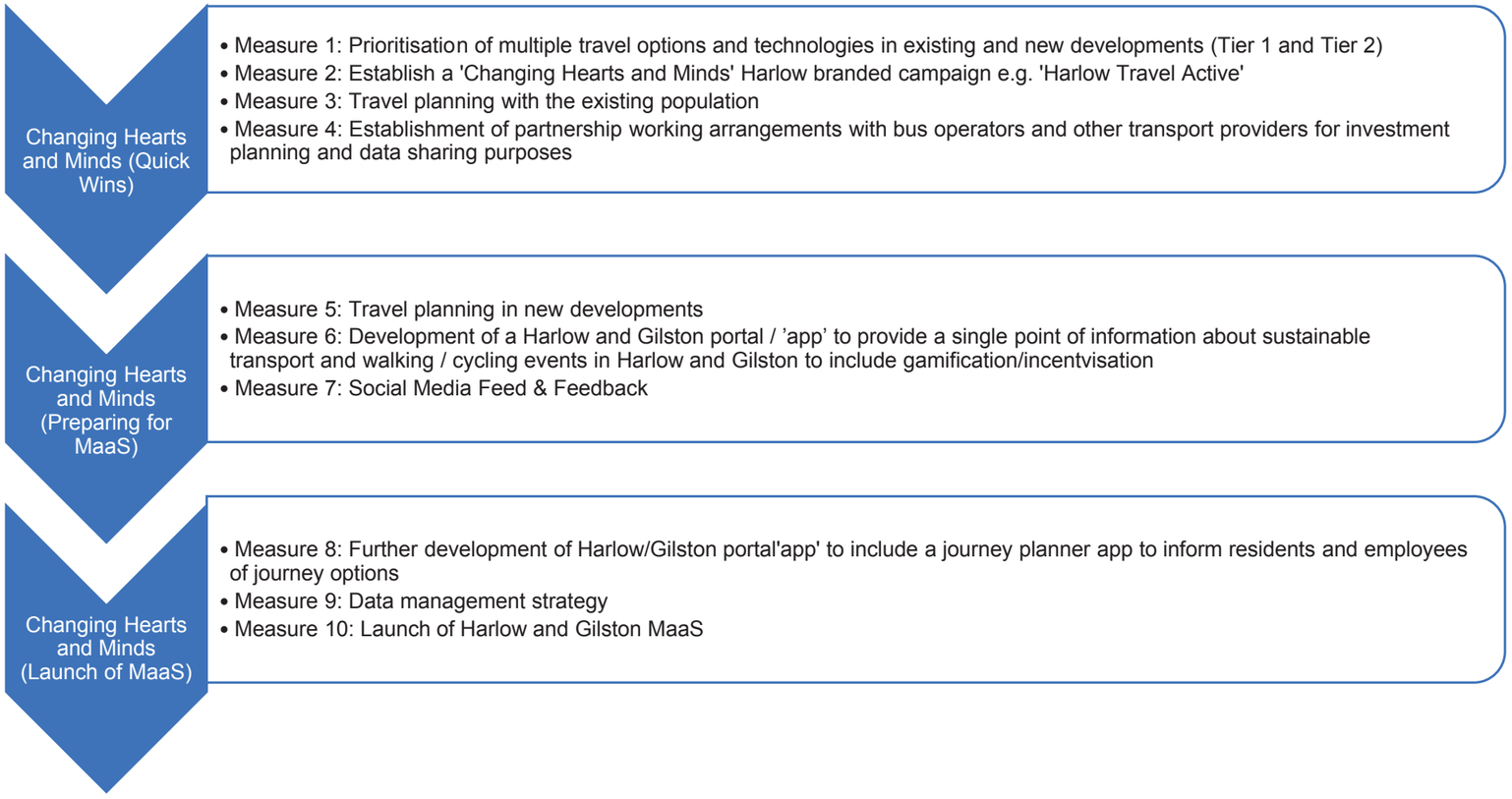
- Real-time bus message boards,
- Variable-messages signs (VMS) that provide cyclists and motorists with real-time information about localised traffic congestion, incidents, roadwork zones and temporary speed limits in addition to parking guidance and capacity information at public car parks.

Other key enabling technology could include:

- Emerging new technologies that allocate additional green time at signals to public transport, cyclists and pedestrians depending on real-time demand and usage will be key to promoting sustainable travel choices.

Some of these technology measures have been discussed in Tier 1 and Tier 2 and it will be key to implement these new technologies in existing urban areas as well as to plan them into the new developments at Latton Priory, Water Lane, Gilston and East Harlow. In the long-term this technological infrastructure will enable real-time communication directly to mobile phones and in-vehicle technology to inform the public of journey times and best travel options and routes.

Ensuring decision makers and developers play their part both in terms of the design of development, provision of facilities and funding will be very important. This will be secured through the local plan policies and



the strategic masterplans that apply to the new areas of development. Local plan policies also have a part to play in encouraging the use of sustainable modes more broadly, and in reducing the need to travel. The availability of extensive cheap parking in the town centre along with easy vehicle access encourages vehicle use. Rebalancing the approach will take time but needs to be considered as the health of town centre improves and more travel options become available.

In June 2015, TfL trialled two types of new cycle priority technology that detected the number of cyclists travelling along Cycle Superhighway 3 on Cable Street, enabling signal timings to be adjusted to give extra green time during peak times when cycle flows are at their highest. Two types of technology can be used for such purposes:

» Radar based technology; and
» Thermal based technology, which detects the heat of riders as they pass a detection zone.

Such technologies allows the timings of signals to reflect demand on a second-by-second basis, and allows greater priority to be given to users of active travel ahead of vehicular road users. If such technology is proven to be successful, there is potential for it to be implemented on key cycle routes and corridors.

Pedestrian Split Cycle Offset Optimisation Technique (SCOOT) could improve pedestrian flow in areas where pedestrian footfall is highest. Similar to vehicular SCOOT, Pedestrian SCOOT makes use of video camera technology to automatically detect how many pedestrians are waiting at crossings, and automatically adjusts signal timings to reflect real-time demand.

Such technology could help to overcome issues at areas of existing conflict between pedestrians and other road users, as with the cycle signal timing technology detailed above, Pedestrian SCOOT provides a greater level of priority to active travel users ahead of vehicular travel.

Weather Dependent Signal Timing are signal timings that are influenced by the weather. The phasing of these signals varies depending on the real-time weather information. For example, in wet weather conditions, a greater length of green time is given to cyclists. Such technology is currently implemented in the Netherlands and could be trialled within in the Abingdon to Oxford corridor.

MEASURE 2: ESTABLISH A 'HARLOW CHANGING HEART AND MINDS' CAMPAIGN E.G. HARLOW TRAVEL ACTIVE

Creating a brand focussed on promoting sustainable travel in the Harlow and Gilston Garden Town provides an identity for the growing town and brand recognition for both existing and new residents. The brand should communicate the culture of the garden town as well as the goal of creating a community that adopts sustainable mobility lifestyles.

MEASURE 3: TRAVEL PLANNING FOR EXISTING POPULATION (RESIDENTS, KEY EMPLOYERS, EDUCATIONAL ESTABLISHMENTS AND KEY DESTINATIONS)

Travel planning is key to promoting the current and emerging sustainable travel options and new technologies to employees and residents living and working in the garden town. Travel planning should be re-invigorated in existing developments and focus on current sustainable travel options, innovation and the future of mobility to capture attention.

Travel plans should be focused on:

- Key employers e.g. through a mechanism such as travel plan forums and the development of action and investment plans. Working with businesses and major employers to promote journeys to work by sustainable modes of transport, or reduce travel demand by facilitating home working will also need to be a key workstream. The arrival of Public Health England and the potential relocation of the hospital offer a really good opportunity to develop a travel plan forum with key employers. This could be used to support the development of a coordinated and evolving programme of activities and investment to promote the use of sustainable modes;
- A comprehensive approach is needed to encourage existing residents to walk, cycle and use public transport for trips of all types. Communication through personalised travel planning, community newsletters and social media should be considered;
- Working with local schools and colleges to develop walk to school programmes and other active travel initiatives;
- Town centre, rail stations and bus station, to ensure public transport services and access by walking and cycling are an attractive alternative to the private car.

Available and emerging travel options and new technologies (journey planner apps, MaaS, electric bikes, electric vehicles, autonomous vehicles) should be marketed to residents and employees through travel plan communication strategies as these new solutions are made available through the implementation of Tier 1 and Tier 2. Travel plans are an opportunity to channel real-time information to people and demonstrate the potential of MaaS e.g. real-time information through message boards at key hubs to publicise expected corridor journey times and the benefit of delaying your journey or changing your mode of travel. Microhubs will also be key locations to promote new travel options and technologies e.g. at Thames Valley Business Park in Berkshire, the travel plan team hold an annual 'EV Fest' for employees to test drive electric and hybrid vehicles. Similar travel plan events in enterprise zones and microhubs and pocket places offer the opportunity to promote future mobility.

PREPARING FOR MAAS

MEASURE 4: ESTABLISHMENT OF PARTNERSHIP WORKING ARRANGEMENTS WITH BUS OPERATORS AND OTHER TRANSPORT PROVIDERS FOR INVESTMENT PLANNING AND DATA SHARING PURPOSES

A partnership with the local bus operators will be vital to delivering both BRT and improving local door to door bus services. Long term goals for public transport quality and mode share need to be agreed and coordinated programmes of investment need to be planned through a mechanism such as a bus quality partnership.

Partnerships can work towards ensuring the transport data which is needed for the development of MaaS platforms is available as open data. Additionally, these partnership can explore emerging opportunities such as smart ticketing, demand responsive transport e.g. ArrivaClick and the co-ordination of new infrastructure such as e-charging points for public and private vehicles.

Given the potential of MaaS and the need for long-term planning with a variety of stakeholders, consideration should be given to the creation of a steering group formed of key local authorities, transport providers and MaaS advisors to ensure collaboration and sharing of knowledge as technology and MaaS develops. Harlow and Gilston could be used as a testbed for the region.

MEASURE 5: TRAVEL PLANNING IN NEW DEVELOPMENTS

Via the planning process travel plans should be key for new developments and the outputs and outcomes monitored as developments become occupied. This will ensure that mode share targets are being achieved in the new developments and residents are firmly encouraged and facilitated to use sustainable transport. Moving house is a key opportunity to change behaviour so all sustainable transport facilities that serve that development also need to be in place when people move in, including bus services. The approaches taken need to include financial and other incentives and events such as community cycle rides, pop up events and play streets, that encourage and enable walking and cycling.

E-bikes and shared bikes are a particular opportunity for the new developments in Harlow and Gilston because of the distances involved. New developments should ensure that people have access to a wide range of bikes including e-bikes and that these are available for trials and promotions.

MEASURE 6: DEVELOPMENT OF A HARLOW AND GILSTON TRAVEL PORTAL AND APP

Using the branding developed as part of 'Measure 2', the development of a portal and app will provide a central hub for travel information in Harlow and Gilston. It can also be used as the beginnings of a full MaaS hub.

Gamification is a useful tool in travel behaviour change and monitoring and this could be incorporated into the app. Gamification applies game oriented approaches such as scoring or leaderboards to non-game contexts such as travel planning. The gamification aspect is used to transform simple, everyday tasks to encourage active travel behaviours such as walking and cycling, it gives new purpose and incentivises those everyday tasks to make it challenging and fun. These tools also have an added benefit of creating social connections and promoting community cohesion. Such tools could be employed in Harlow and Gilston to encourage and reward sustainable travel behaviour.
For example, the BetterPoints app is used in Reading to promote sustainable travel behaviour (www.betterpoints.uk). BetterPoints is a smartphone application and web platform using GPS to track user's movements and rewards them with pre-decided prizes (i.e. shopping/ restaurant vouchers/charity donations) for walking, cycling, car sharing or using public transport. Spending points can be targeted at local towns to support the local economy. BetterPoints also provides rich data to help monitor the travel that has been carried out by the app's users. Other challenges focus on specific modes e.g. European Cycle Challenge (www.cyclechallenge.eu).

MEASURE 7: SOCIAL MEDIA FEED & FEEDBACK

A Twitter feed can broadcast traffic network updates and advance alerts which is also used by radio stations. The Sustainable Transport Corridors could harness social media to provide real-time information on particular transport issues, suggesting alternative routes where feasible (similar to TfL's social media usage at present).

Social media tools can also be used to provide user feedback on the network, for example cyclists and pedestrians can pinpoint areas where they have concerns and mitigating actions can be planned, and motorists can log details about pot holes which can then be logged into asset management tools. Mobile phone data can also be used to map the movement and place interaction of individuals, particularly linked to the railway stations. Monitoring social media feeds can help to identify major and common issues at a local level, including the frequency of congestion or delays at particular pinchpoints.

LAUNCHING MAAS

MEASURE 8: FURTHER DEVELOPMENT OF THE HARLOW AND GILSTON TRAVEL PORTAL AND APP (TO INCLUDE REAL-TIME JOURNEY PLANNING)

There are existing journey planners e.g. CityMapper which offers A to B journey planning incorporating real time information for all modes of transport in London including: underground, rail, bus, cycling, walking and taxi. City Mapper uses open data from Transport for London (TfL) as well as geolocation to provide users with accurate journey times straight to their smart phone. CityMapper is independent from transport operators but relies on the data to notify its users of the services available, compare routes, prices and alert about delays. CityMapper is an example of using open data from multiple sources to provide better linked-up transport solutions. The data generated by such Wayfinding applications is a powerful tool for planners providing a rich seam of data on planned and undertaken trips. Liaising with the developers of such Apps (CityMapper, Walkit) to access their data, can provide a clear evidence base for schemes to improve well used routes and indeed identify less well used routes which could be improved and promoted. Outside of London, comprehensive journey planners are more patchy. However, Oxfordshire's LTP4 discusses the development of an Oxfordshire Journey Planner through the development of the 'Zipabout' and 'CATCH' applications. Investigating the opportunity for the garden town to link with the development of these apps should be explored.

MEASURE 9: A DATA MANAGEMENT STRATEGY.

Combined data from smart card ticketing, mobile phone usage, parking and permits, vehicle to infrastructure (V2I) communication and vehicle to vehicle (V2V) communication will provide rich layers of data, informing when and how people move around during both normal and abnormal periods, e.g. major events. In addition a further layer can be added to encompass feelings and thoughts, sentiment mapping of social media e.g. Twitter can be used to provide heat maps of problems alerting residents of any major or common issues.

All of this data will require a clear data management strategy and Harlow and Gilston should feed into the emerging future mobility strategies of Essex and Hertfordshire County Councils to ensure the garden town's approach is a key part of the region's plans. There should be interoperability between datasets, with standardisation of systems and service architecture. The data itself should be handled securely and anonymised before it is used; where feasible the anonymised data should be made open source allowing developers access and providing a platform for innovation. The Data Management Strategy should be a key focus of discussion and agreement for the steering group suggested as part of Measure 4.

MEASURE 10: LAUNCH OF HARLOW AND GILSTON MAAS

The ultimate goal is for residents and employees to subscribe to a town-wide service that allows easy access to information on public transport, car sharing and bike sharing through a universal payment system accessed through an app on smartphones.

MaaS could transform towns and cities. One scenario points towards streets with less traffic making them pedestrian friendly and making cycle lanes more possible. Air quality improves because traffic congestion has reduced. The streets are no longer lined with parked cars and local authorities no longer spend so much money to maintain and build infrastructure for cars and are able to invest in

cycle lanes, paths and parks with pedestrian walkways. MaaS will emerge over time and increase as people appreciate the benefits and the roadmap is implemented. The greater the number of subscribers the more comprehensive and valuable is the information collected. The information drives service improvement that in turn attracts more people. By analysing the data, providers of mobility services can predict usage and maintain the necessary supply of bikes, cars and public transport to meet demand in specific locations.

The description below of Mary illustrates the potential of MaaS for a resident of Harlow.

MARY - AN EARLY ADOPTER OF MOBILITY AS A SERVICE

IT IS 2020...

Mary lives in Harlow and is a junior doctor at the Princess Alexandra Hospital. She has downloaded the Harlow Mobility App. It is 6.30am on Monday morning and Mary is going to work – it is raining. The mobility app on her phone (through which Mary has specified her parameters for timing), suggests Mary should catch the 7.30am bus to work. At the end of her shift the weather is forecast to be dry and so the app suggests using the new bike share facility for her commute home. She clicks yes on her phone and a bike is automatically reserved for her at the hospital. On the bus, Mary taps her phone on the sensor to pay for her ticket via Apple Pay. At the end of her workday, Mary cycles home on the dedicated cycle and walk greenway and drops the bike at the bike share hub nearest her home. At the weekend, Mary travels by car to Stansted Airport to pick up friends who are visiting for the weekend. VMS signs along the STCs and the M11 provide travel information about current traffic congestion and advise her of the route she should take.

IT IS 2025...

Mary is now a consultant at the Princess Alexandra Hospital. She has subscribed to Harlow's Mobility app. She pays a subscription fee that gives her access to all modes of shared transport in Essex and Hertfordshire and therefore she has calculated that the convenience means she no longer needs to own a car. Mary travels to work based on the advice provided by the app on her phone – this can vary depending on her shift, the weather or any incidents in the area. She does not incur additional costs because her travel is included in her subscription fee and GPS on her phone tracks how she is travelling so that real-time data is collected of her travel around the region. At the weekend Mary travels to Stansted Airport to fly to Belfast. The car share feature on her mobility app notifies her that two others are travelling from her area of Harlow to Stansted. The fee for the car share is automatically split among the three subscribers. The app chooses a route for them and directs them to available parking spaces when they arrive at Stansted.

7 | Indicative Costs

INDICATIVE COSTS

To understand the scale of investment necessary to deliver transformational modal shift, indicative costs have been developed. These costs are high level and give a guide as to the scale of investment necessary.

As design works develop the cost envelope can be refined.

A number of assumptions / exclusions / clarifications are listed with the costs which are shown in summary opposite and a more detailed spreadsheet is contained within Appendix A.

The methodology used to assess costs has been to provide unit rates for individual items within the sustainable transport corridors and then look at how many of these items are likely within the corridor or how much of the corridor length is to be treated.

To assess the costs of crossing facilities for example an assumption has been made as to the frequency of the new crossing facilities to be provided.

Provision for items such as seating, wayfinding, lighting and streetscape enhancements are included in the unit rates for linear enhancements.

The unit rates that have been used are based on a combination of experience and looking at the publicly available costs of schemes which have been delivered and broad guidance from documents such as SPONS. It has to be stressed that these are high level and are geared towards establishing the scale of investment.

The costs for the door to door walking and cycling are based on our experience of the broad costs of delivery of the type of works proposed and assumptions about the number of interventions. Although addressing door to door walking and cycling is important, priority will need to be given to the transformational change on the sustainable transport corridors. All costs identified here reflect delivery costs based on our experience of similar projects elsewhere.

Sustainable Transport Corridors

As detailed in Section 6 and the table on page 64	
Corridor 1: North	£61,174,583
Corridor 2: South	£24,654,250
Corridor 3: East	£27,388,500
Corridor 4: West	£18,543,750
Town Centre Interchange	£38,250,000
TOTAL	£170,011,083

Door to Door Walking / Cycling and Public Transport	**Assumed unit cost (£)**	**Nº**	**Cost**
Allowance for speed management / limit programme including 20mph zones for residential areas	£525,000	1	£525,000
Allowance for programme of gateway entry treatments	£26,250	50	£1,312,500
Programme to improve crossing facilities	£52,500	20	£1,050,000
Programme to provide cycle parking at destinations	£10,500	20	£210,000
Allowance for capital investments to support cross town bus services	£52,500	1	£52,500
Allowance for small capital investment to support on demand trial	£52,500	1	£52,500
TOTAL			£3,202,500

Changing Hearts and Minds and Partnership Working

Travel planning in new developments - assume 10 years commitment required - revenue and events funding	£525,000	4	£2,100,000.
Travel planning across the town including working with businesses - assume 10 years commitment - revenue and events funding	£1,050,000	1	£1,050,000
Development of Harlow Travel App - maintenance done as part of the town-wide travel planning workstream (basic app)	£52,500	1	£52,500
TOTAL			£3,202,500

8 | Delivery Plan

DELIVERY PLAN - 0 TO 5 YEARS

PACKAGE	ACTION
Sustainable Transport Corridor 1 - North	1. Develop an outline business case to support the £175m HiF bid to deliver the Second Stort Crossing. This includes the northern section of the STC from the Burnt Mill roundabout to Third Avenue and also includes the section through the town centre. 2. Develop detailed design for corridor between the town centre and the edge of the Gilston Development and commence delivery 3. Develop design for corridor between the town centre and the edge of the Gilston Development - including modelling, junction design and landscape strategy to support detailed business case 4. Develop / agree Gilston masterplan and agree phasing for the delivery of on-site key infrastructure i.e. access, micro hub and sustainable transport corridor through development 5. Negotiate funding for improvements to this corridor from developments 6. Commence delivery of sustainable transport corridor and micro hub in Gilston in accordance with agreed phasing
Sustainable Transport Corridor 2 - South	1. Maintenance work to the existing cycle/walk network running south from Town Centre 2. Develop design for sustainable transport corridor between town centre and Latton Priory including modelling, land assembly work/ resolving any third party ownership issues and landscape strategy to support a detailed business case. 3. Develop / agree Latton priory masterplan and agree phasing for the delivery of on-site key infrastructure i.e. micro hub and sustainable transport corridor through development to Epping Road 4. Negotiate funding for improvements to this corridor from developments 5. Develop detailed design for sustainable transport corridor between town centre and Latton Priory and commence delivery 6. Commence delivery of sustainable transport corridor and micro hub in accordance with agreed phasing
Sustainable Transport Corridor 3 - East	1. Develop design for sustainable transport corridor between the town centre, Pinnacles and Eastern sites including Burnt Mill, develop detailed business case and delivery plan 2. Maintenance of existing cycle network on key links - surfacing and vegetation maintenance 3. Continue to develop a feasibility study for the East West cycle/walking route, and associated bid for funding in 2019 from the Essex Cycling budget 4. Develop/agree development masterplan and phasing to deliver sustainable transport corridor link through the site and micro hub 5. Commence delivery of the sustainable transport corridor and micro hub through development site

“Quick wins” are highlighted in yellow.

PACKAGE	ACTION
Sustainable Transport Corridor 4 - West	1. Maintenance of existing cycle network on key links - surfacing and vegetation maintenance 2. Develop design for sustainable transport corridor between the town centre and Water Lane sites, develop detailed business case 3. Develop/agree development masterplan and phasing to deliver sustainable transport corridor link through the site and micro hub 4. Develop detailed design for sustainable transport corridor between the town centre and Water Lane sites 5. Commence delivery of sustainable transport corridor and micro hub through development site
Interchange - Town Centre and Ring Road	1. Develop design for whole town centre ring road including design for public transport, at grade crossing facilities, a landscape strategy and modelling to support a detailed business case and in conjunction with the development of the area action plan, and commence delivery 2. Commence designs for new bus interchange facilities
Door to Door Walking and Cycling	1. Develop speed limit plan and proposals for 20 mph in residential areas 2. Comprehensive assessment of missing links to sustainable transport corridors 3. Town-wide wayfinding and signage improvements 4. Deliver first phase of speed limit strategy focussing on delivery of 20 mph zones in areas around the sustainable transport corridors and speed limit changes around the town centre and northern sustainable transport corridor as these corridors commence delivery 5. Deliver first phase of gateway treatments, improved crossing facilities and missing links programme
Changing Hearts and Minds and Partnership Working	1. Implementation of multiple travel options and technologies in existing and new developments (Tier 1 and Tier 2) 2. Establish a “Changing Hearts and Minds” Harlow branded campaign e.g. “Harlow Active Travel” 3. Travel planning with the existing population 4. Establishment of partnership working arrangements with bus operators and other public transport providers for investment planning and data sharing purposes 5. Seek funding from developments for the sustainable transport corridors 6. Seek funding from developments to fund travel planning within developments but also across town 7. Commence behaviour change programmes in new developments as housing is completed 8. Develop focussed behaviour change work streams for the Hospital and PHE 9. Continue to seek funding from developments across the Harlow and Gilston Garden town for the sustainable transport corridors

DELIVERY PLAN - 5 TO 10 YEARS

PACKAGE	ACTION
Sustainable Transport Corridor 1 - North	1. Complete delivery of the corridor between the town centre and the edge of the Gilston Development 2. Continue delivery of the sustainable transport corridor through the development to the agreed phasing plan Complete the micro hub. Seek early completion of a cycle-walk link into the lanes to the north of the site. 3. Commence BRT operation
Sustainable Transport Corridor 2 - South	1. Complete the sustainable transport corridor between town centre and Latton Priory 2. Deliver the complete sustainable transport link through the development site to Epping Road. Complete the micro hub 3. Commence BRT operation
Sustainable Transport Corridor 3 - East	1. Commence delivery of the sustainable transport corridor between the town centre and Eastern site 2. Complete delivery of the sustainable transport corridor link with Pinnacles and the eastern development sites 3. Commence BRT operation
Sustainable Transport Corridor 4 - West	1. Commence delivery of the sustainable transport corridor between the town centre and Water Lane sites 2. Complete delivery of the sustainable transport link through the development 3. Commence BRT operation
Interchange - Town Centre and Ring Road	1. Continue delivery of ring road transformation 2. Continue delivery of new bus interchange facilities
Door to Door Walking and Cycling	1. Complete delivery of 20 mph zones and changes to speed limits on sustainable transport corridors as they are delivered 2. Continue delivery of gateway treatments, missing links and improved crossing facilities 3. Trial on demand shared transport service
Changing Hearts and Minds and Partnership Working	1. Continue delivery of town wide behaviour change, partnership working and events programmes 2. Continue development behaviour change programmes 3. Continue partnership working with public transport operators 4. Commence monitoring

DELIVERY PLAN - 10 YEARS +

PACKAGE	ACTION
Sustainable Transport Corridor 1 - North	1. Complete sustainable transport corridor through development
Sustainable Transport Corridor 2 - South	1. Complete sustainable transport corridor through development
Sustainable Transport Corridor 3 - East	1. Complete sustainable transport corridor through development
Sustainable Transport Corridor 4 - West	1. Complete sustainable transport corridor through development
Interchange - Town Centre and Ring Road	1. Complete town centre ring road transformation 2. Complete new bus interchange facilities
Door to Door Walking and Cycling	1. Complete speed limit review 2. Continue to deliver gateway treatments, crossing facilities and missing links
Changing Hearts and Minds and Partnership Working	1. Continue delivery of town wide behaviour change, partnership working and events programmes but informed by monitoring outputs 2. Continue development behaviour change programmes but informed by monitoring out puts 3. Continue partnership working with public transport operators 4. Continue monitoring

Fostering a culture of walking and cycling is a key outcome of the Sustainable Transport Corridors Strategy, encouraging people to make the most of existing active travel routes. In some parts of the town, these would benefit from additional overlooking.

9 | Outcomes and Monitoring

SUSTAINABLE TRANSPORT OUTCOMES AND MONITORING

To ensure the Sustainable Corridor Strategy is delivered it is important that the outcomes are monitored. The outcomes which have been set out earlier in the document are listed here along with potential approaches to monitoring.

These outcomes were developed through discussion with stakeholders and the client team.

Outcome	Method of Measurement
An average of 50% of journeys to work are made by sustainable modes across the town with 60% in the new settlements	1. Measurement of journey to work mode share through biennial survey and census
High quality, rapid, and high frequency public transport is available that competes with single occupier car journeys	2. Public transport mode share for journey to work through biennial survey and census 3. Survey of perception of public transport
Harlow and Gilston has a strong walking and cycling culture and most people can identify somewhere they love to walk or cycle to	4. Walking and cycling mode share for journeys to work through biennial survey and census 5. Biennial survey which explores how many people have somewhere they love to walk and cycle to
Easy to access, convenient and inclusive sustainable mobility is available to all.	6. Availability of sustainable, accessible door to door transport. Develop initial measure and monitor against that. 7. Availability of shared transport at evenings and weekends
The cycle and walk network and its associated public spaces are used by all communities and they bring communities together	8. Biennial survey of users to identify who uses which spaces , how often and for what purpose
The transport network is resilient and as far as possible can accommodate and respond to changing technologies and associated opportunities	9. Develop a measure which scores the resilience of the network against key uncertainties / trends. This should include the move towards electric vehicles and managing the potential impacts of CAV.

Appendices

APPENDIX A | COSTS

APPENDIX B | CHARACTERISTICS OF PLACES WITH HIGH SUSTAINABLE MODE SHARE

APPENDIX A | COSTS

COSTS

To understand the scale of investment necessary to deliver transformational modal shift, indicative costs have been developed. These costs are high level and give a guide as to the scale of investment necessary.

As design works develop the cost envelope can be refined.

The methodology used to assess costs has been to provide unit rates for individual items within the sustainable transport corridors and then look at how many of these items are likely within the corridor or how much of the corridor length is to be treated.

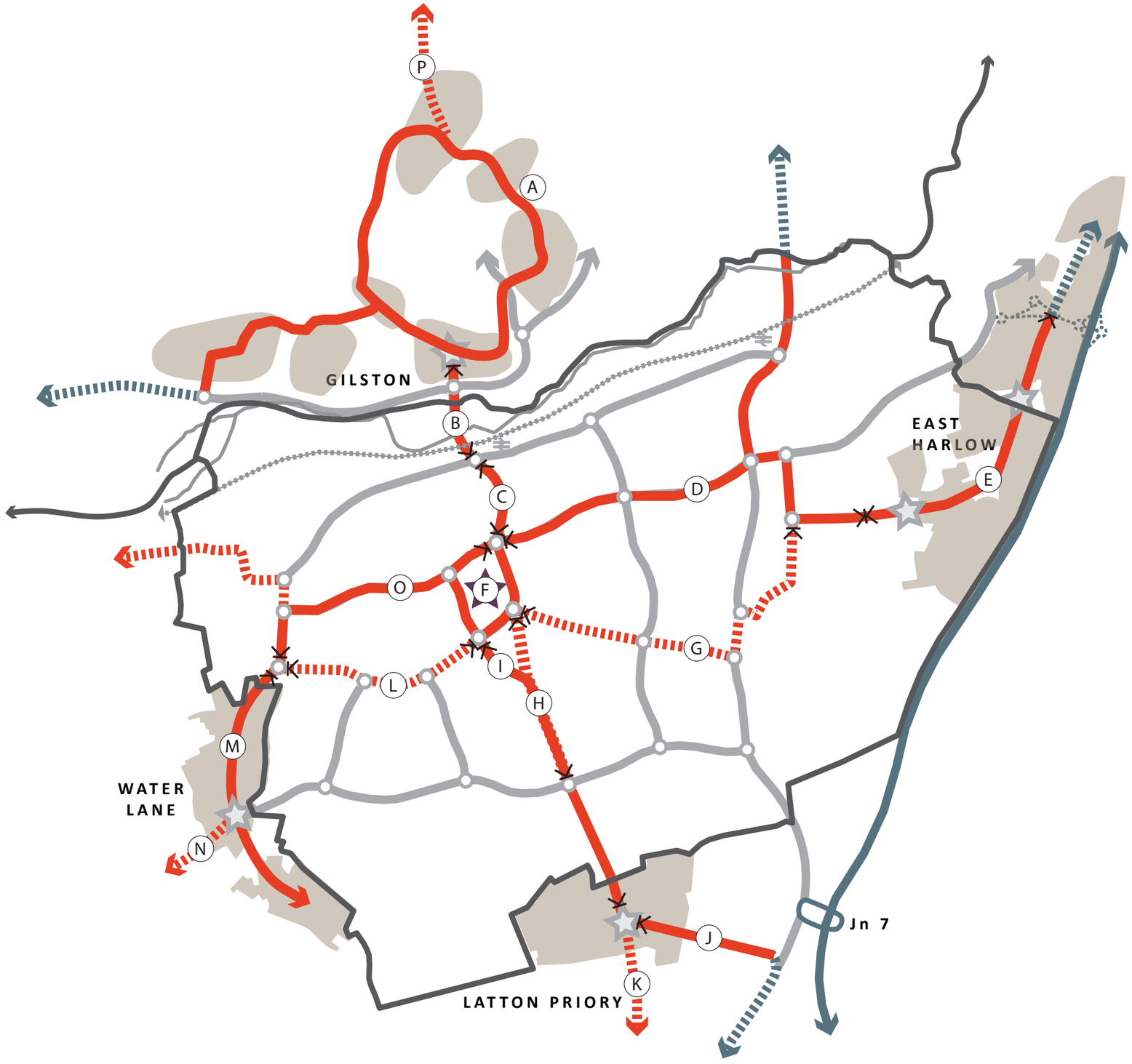
To assess the costs of crossing facilities for example an assumption has been made as to the frequency of the new crossing facilities to be provided.

Provision for items such as seating, wayfinding, lighting and streetscape enhancements are included in the unit rates for linear enhancements.

The unit rates that have been used are based on a combination of experience and looking at the publicly available costs of schemes which have been delivered and broad guidance from documents such as SPONS. It has to be stressed that these are high level and are geared towards establishing the scale of investment.

The costs for the door to door walking and cycling are based on our experience of the broad costs of delivery of the type of works proposed and assumptions about the number of interventions. Although addressing door to door walking and cycling is important, priority will need to be given to the transformational change on the sustainable transport corridors. All costs identified here reflect delivery costs based on our experience of similar projects elsewhere.

This diagram illustrates the location of the “Segments” referred to in the following costs table.



COMPONENTS		ASSUMED UNIT COSTS £			NORTH - CORRIDOR 1			
SEGMENTS					A		B	C	P
INDICATIVE COSTS	UNIT	FREQUENCY	REFERENCE		CAPITAL COSTS WITHIN GILSTON DEVELOPMENT	BUS REVENUE SUPPORT ASSUMED REQUIRED UNTIL C 2000 UNITS BUILT = C 6 YEARS PUMP PRIMING AFTER FIRST OCCUPATION GILSTON F			
SUSTAINABLE TRANSPORT CORRIDORS									
CORRIDOR SEGMENT LENGTH	M				6,500M		1,000M	800M	11,000M
STREETWIDE PUBLIC REALM TRANSFORMATION	M²			£300.00					
NEW BUS MALL / INTERCHANGE	NO			£8,000,000					
EXISTING CYCLE WAY/FOOTWAY ENHANCEMENT - SUPERGREENWAY	PER M			£400					
NEW CYCLE WALK FACILITY - SUPERGREENWAY	PER M			£1,200	£7,800,000		£1,200,000	£960,000	£13,200,000
SIGNALISED CROSSING FACILITIES BETWEEN JUNCTIONS ASSUME EVERY 200M - ACROSS DUAL CARRIAGEWAY	Nº	300		£200,000				£533,333	
SIGNALISED CROSSING FACILITIES BETWEEN JUNCTIONS ASSUME EVERY 200M - ACROSS SINGLE CARRIAGEWAY	Nº	300		£125,000					
SMALL POCKET PLACE - SUPER GREENWAY - ASSUME EVERY 200M	M	200		£40,000	£1,300,000		£200,000	£160,000	
LARGE POCKET PLACE - SUPERGREENWAY - ASSUME EVERY 1000M	M	1000		£100,000	£650,000		£100,000	£80,000	
NEW BUS ROAD (C6.5M) / DEVELOPMENT SUSTAINABLE TRANSPORT CORIDOR - EXCLUDING ANY ENGINEERING WORKS	M			£2,500	£16,250,000		£2,500,000		
BUS PRIORITY LANE X 1 - EXCLUDING ANY ENGINEERING WORKS	M			£1,200				£960,000	
HIGH QUALITY BUS STOP WIFI AND RTI - ASSUME BUS STOP EVERY 400 M	M	400		£15,000 EACH	£243,750		£37,500	£30,000	
MICROHUB AND INTERCHANGE		1 PER DEVELOP-MENT	CYCLEPOINT IN LEEDS: £500K IN 2010	£800,000	£800,000				
JUNCTION TRANSFORMATION - SMALL - PEDESTRIANS AND CYCLISTS	Nº			£500,000					
JUNCTION TRANSFORMATION - MEDIUM - PEDESTRIANS AND CYCLISTS / UTC / BUS PRIORITY	Nº			£2,000,000				£2,000,000	
JUNCTION TRANSFORMATION - LARGE - PEDESTRIANS AND CYCLISTS / UTC/BUS PRIORITY	Nº			£5,000,000			£5,000,000		
PEDESTRIAN / CYCLE BRIDGE	Nº		CAVERSHAM READING STATION	£6,000,000	£6,000,000				
COST PER BUS PER YEAR ASSUME 3 BUSES REQUIRED FOR A HIGH FREQUENCY SERVICE TO GILSTON, LATTON PRIORY AND WATER LANE. ASSUME 4 BUSES REQUIRED FOR THE SITES ON THE EAST OF HARLOW	Nº			£130,000		£1,170,000			
PUBLIC TRANSPORT REVENUE COSTS						£1,170,000			
SEGMENT TOTAL - CAPITAL COSTS WITHIN DEVELOPMENT SITES					£33,043,750				
SEGMENT TOTAL - CAPITAL COSTS WITHIN HARLOW AND GILSTON - EXISTING							£9,037,500	£4,723,333	
STRATEGIC CYCLE CONNECTIONS OUTSIDE HARLOW									£13,200,000

CORRIDOR 1 TOTAL: £60,894,583

SOUTH - CORRIDOR 2				EAST - CORRIDOR 3				WEST - CORRIDOR 4				TOWN CENTRE INTERCHANGE	TOTALS
H	I	J	K	D	E		G	L	M	N	O	F	
		WITHIN LATTON PRIORY			WITHIN EAST HARLOW	BUS REVENUE SUPPORT ASSUMED REQUIRED UNTIL C 2000 UNITS BUILT = C 6 YEARS PUMP PRIMING AFTER FIRST OCCUPATION ON THE EASTERN DEVELOPMENT SITES			BUS REVENUE SUPPORT ASSUMED REQUIRED UNTIL C 2000 UNITS BUILT C 10 YEARS					
1,650M	3,100M	1,100M	6,800M	3,600M	2,200M		3,600M	1,900M	2,000M	7,800M	2,100M	2,100M	
										£2,340,000		£15,750,000	
												£8,000,000	
£660,000	£124,000		£2,720,000	£1,440,000	£2,640,000		£1,440,000	£760,000			£840,000		
	£744,000	£1,320,000							£2,400,000				
	£125,000			£1,500,000									
£330,000	£620,000	£220,000		£720,000	£440,000		£720,000	£380,000	£400,000		£420,000		
£165,000	£310,000	£110,000		£360,000	£220,000		£360,000	£190,000	£200,000		£210,000		
	£7,750,000	£2,750,000			£5,500,000				£5,000,000				
	£3,720,000												
		£41,250		£1,350,000	£82,500				£75,000		£78,750		
		£800,000			£800,000				£800,000				
				£500,000			£1,500,000	£1,500,000			£1,000,000	£500,000	
				£2,000,000								£4,000,000	
				£5,000,000								£10,000,000	
			£2,145,000			£1,560,000				£1,950,000			
			£2,145,000			£1,560,000				£1,950,000			**£6,825,000**
		£5,241,250			£9,682,500				£8,875,000				**£56,842,500**
£1,155,000	£13,393,000			£12,126,000			£4,020,000	£2,830,000			£2,548,750	£38,250,000	**£88,083,583**
			£2,720,000							£2,340,000			**£18,260,000**
CORRIDOR 2 TOTAL: £24,592,250				CORRIDOR 3 TOTAL: £27,388,500				CORRIDOR 4 TOTAL: £18,543,750				£38,250,000	**£170,011,083**

Sustainable Transport Corridors

As detailed in Section 6 and the table on page 64	
Corridor 1: North	£61,174,583
Corridor 2: South	£24,654,250
Corridor 3: East	£27,388,500
Corridor 4: West	£18,543,750
Town Centre Interchange	£38,250,000
TOTAL	£170,011,083

Door to Door Walking / Cycling and Public Transport	**Assumed unit cost (£)**	**Nº**	**Cost**
Allowance for speed management / limit programme including 20mph zones for residential areas	£525,000	1	£525,000
Allowance for programme of gateway entry treatments	£26,250	50	£1,312,500
Programme to improve crossing facilities	£52,500	20	£1,050,000
Programme to provide cycle parking at destinations	£10,500	20	£210,000
Allowance for capital investments to support cross town bus services	£52,500	1	£52,500
Allowance for small capital investment to support on demand trial	£52,500	1	£52,500
TOTAL			£3,202,500

Changing Hearts and Minds and Partnership Working

Travel planning in new developments - assume 10 years commitment required - revenue and events funding	£525,000	4	£2,100,000.
Travel planning across the town including working with businesses - assume 10 years commitment - revenue and events funding	£1,050,000	1	£1,050,000
Development of Harlow Travel App - maintenance done as part of the town-wide travel planning workstream (basic app)	£52,500	1	£52,500
TOTAL			£3,202,500

APPENDIX B | CHARACTERISTICS OF PLACES WITH HIGH SUSTAINABLE MODE SHARE

As well as exploring the current issues affecting the environment for sustainable travel in Harlow and Gilston Garden town it is also possible to learn from places where the use of sustainable modes are high.

Looking at 'precedent places' such as Cambridge, Norwich, Groningen and Freiberg does not give a precise template with which to determine what needs to be done in Harlow and Gilston, but it does provide clear insight into the characteristics of places where sustainable and shared modes of transport compete effectively with car travel and have high levels of use.

A review of precedent places with high non car mode share revealed that they have some or all of the characteristics listed on the right.

To deliver transformational change in the levels of sustainable transport mode share in the Harlow and Gilston Garden Town the issues with the current sustainable transport network need to be addressed and the characteristics of the transport networks in places where sustainable mode share is high used to inform how this is done.

WALKING AND CYCLING:

- Local destinations such as food shops, schools and local centres are within walking distance
- High frequency high quality public transport stops are within walking distance (c 400m) of most homes
- The walking and cycling environment is inclusive and can be used independently by people of all ages and abilities
- Street design gives people walking and cycling freedom of movement and allows them to take direct routes without any significant distance or level penalties
- Walking and cycling networks feel safe and are generally well overlooked
- Walking and cycling networks are comfortable and have rest points and stopping places
- Walking and cycling networks are dense, well connected and give people a choice of routes - in Norwich, five "Pedalways" spread outwards from the city centre and two more form an inner and outer circuit around the City, providing a comprehensive network of cycle routes
- The walking and cycling environment is stimulating and attractive and connects key destinations, including leisure destinations
- Speed limits are low generally 20mph (residential areas) to 30 mph (key vehicle corridors)
- Walking and cycling is more convenient than driving - in Cambridge, more than 50% of people cycle at least once a week

PUBLIC TRANSPORT:

- High Frequency
- High quality, often with facilities such as real time information and WiFi
- Stops are within walking distance of most people – c400m
- Quicker / more convenient than driving - in Groningen all urban and regional buses start or terminate at the central train station
- New urban extensions are shaped around access to the public transport (PT) network
- The PT network for new areas extends existing successful PT
- There is one ticketing system. In Freiberg, there is a policy that any ticket for a concert, sports event, fair, or big conference also serves as a ticket for public transport.
- There is ease of access to information
- There is a limited requirement to interchange, but interchange is easy and convenient
- There is good surveillance and overlooking of stops
- Denser development closer to PT core

PRIVATE VEHICLES:

- Parking at destinations limited and / or expensive and / or in less convenient locations
- Private vehicles take less direct routes
- Freiberg has a vehicle-free city centre except for trams and cycles


HARLOW CIVIC SOCIETY 2008
To honour the work of
Sir Frederick Gibberd
1908 - 1984
Architect, Landscape Designer
Master Planner of Harlow
1947 - 1984
IF YOU SEEK MY MONUMENT - LOOK AROUND YOU

SYSTRA