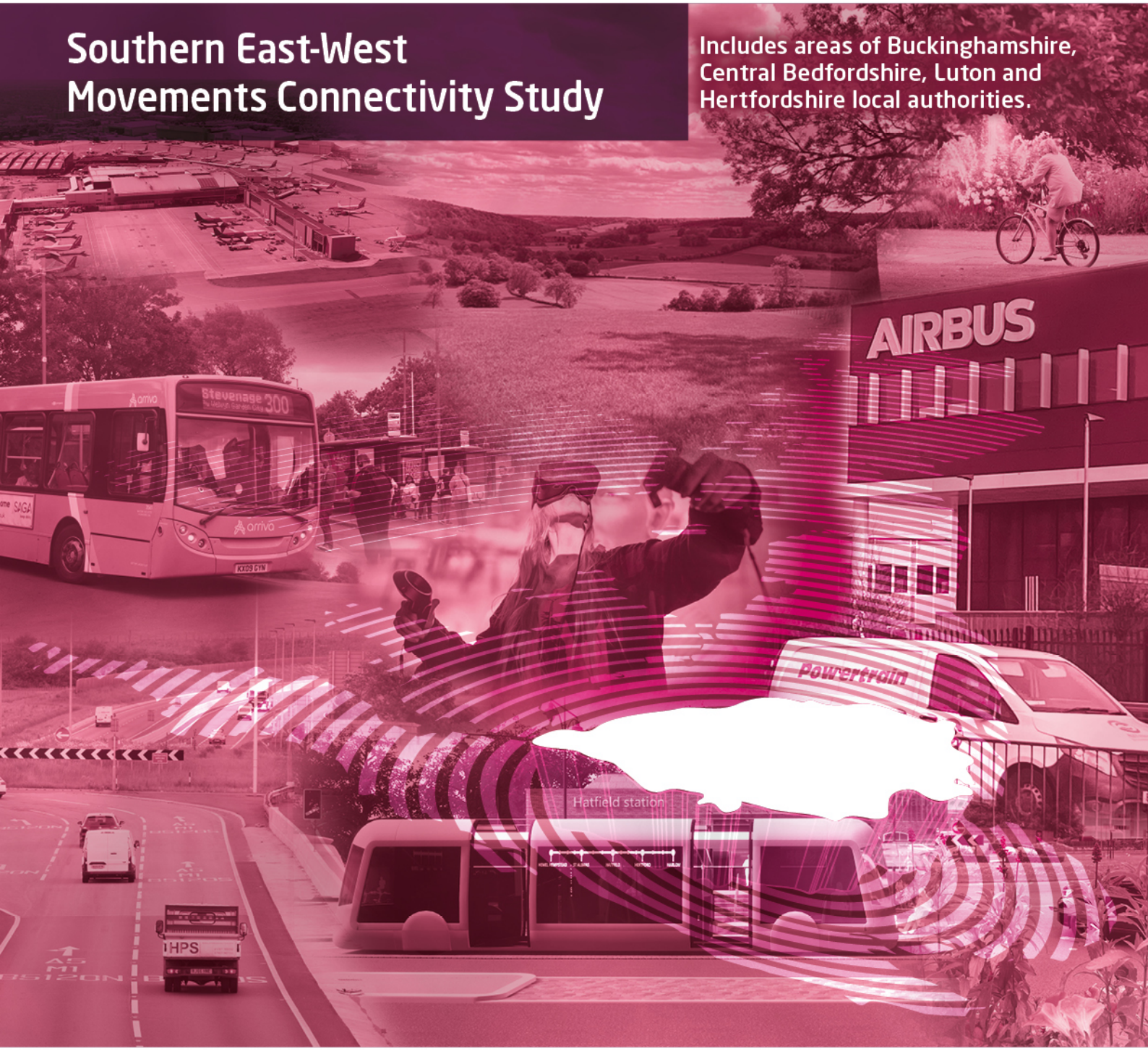
ENGLAND'S ECONOMIC HEARTLAND

Southern East-West Movements Connectivity Study

Includes areas of Buckinghamshire, Central Bedfordshire, Luton and Hertfordshire local authorities.



Prepared in partnership with EEH by Steer and WSP

Table of Contents

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Overview

England's Economic Heartland (EEH) is the sub-national transport body responsible for bringing together local transport authorities in a strategic partnership for the region extending from Swindon to Cambridgeshire and North Northamptonshire to Hertfordshire.

Our 2021 Transport Strategy, ***Connecting People, Transforming Journeys***, set an ambitious policy framework with the vision for our transport system:

> *"To support sustainable growth and improve quality of life and wellbeing through a world-class, decarbonised transport system which harnesses the region's global expertise in technology and innovation to unlock new opportunities for residents and businesses, in a way that benefits the UK as a whole."*

Our strategy highlights that ours is **one of the world's leading economic regions**, with its success HERfounded on science and technology innovation, powered by a network of world-leading universities and research centres.

We work closely with infrastructure owners and operators to support a smooth transition to a decarbonised regional transport network in line with the science and legal requirements, as well as our ambition to reach net zero by 2040. This is done while maximising economic opportunities, increasing resilience and access, and reducing car dependence and congestion caused by development.

Since 2021 a **programme of six Connectivity Studies has examined** areas of the region in more detail, identifying packages of multimodal infrastructure, service, or policy interventions to help achieve the Transport Strategy's objectives and inform the EEH Investment Prioritisation Framework.

Based on a detailed methodology, the Framework is intended to record, track, and assist in prioritisation of strategic transportation interventions that have been proposed in or may significantly impact the EEH region.

This fifth study in the programme examined the area from the M40 corridor to the M11 corridor between the urban areas of Aylesbury, Luton, St Albans, Stevenage, Watford, and various commuter towns to the north of London (see Figure 1). The study had a **focus on improving east west connectivity between various urban areas and employment clusters, reducing pressure on the A414 corridor in particular and also reducing the need for journeys across the region to be made via London or M25 for strategic road connectivity.**

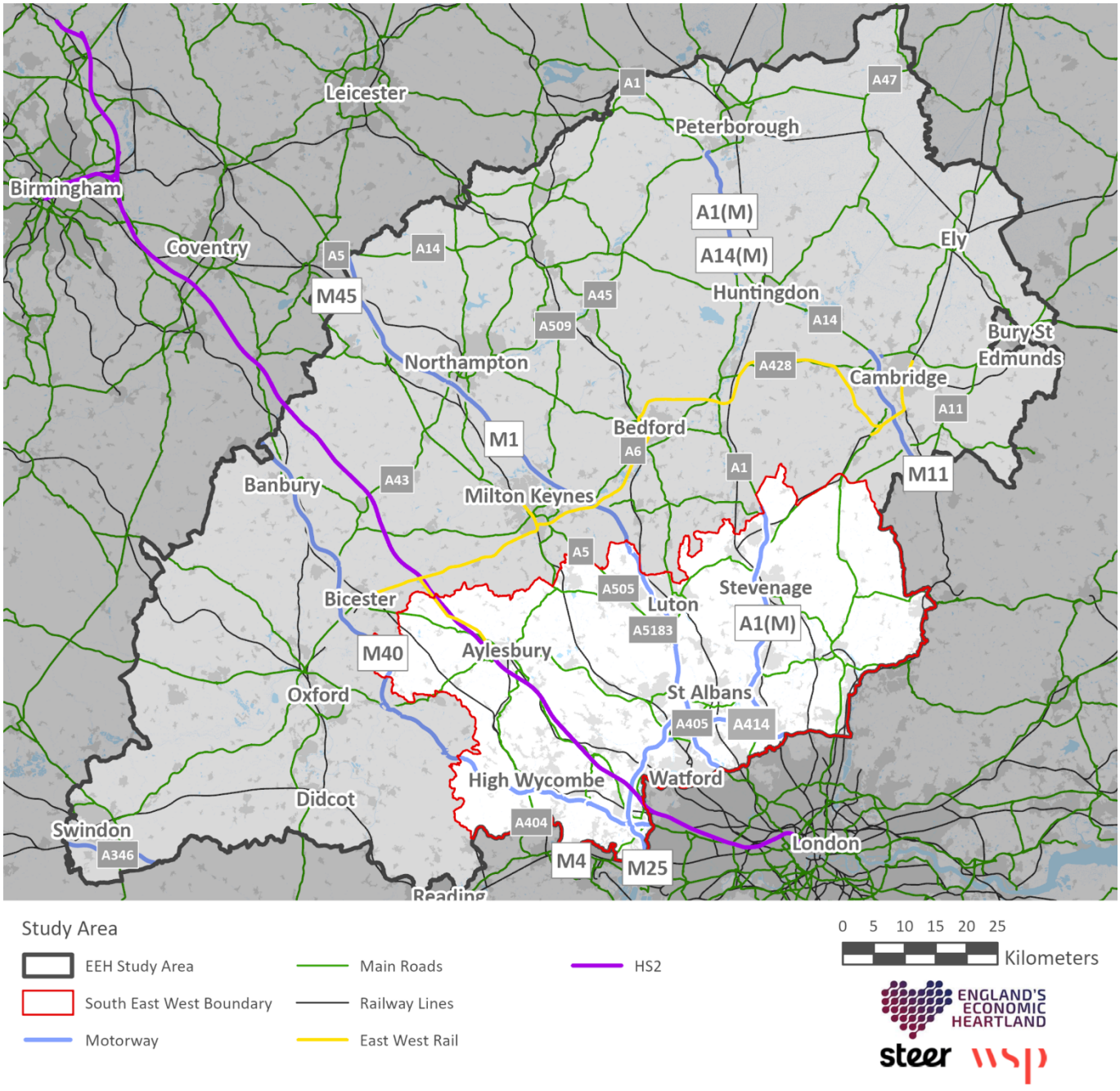
The area is home to the University of Bedfordshire, University of Hertfordshire, BRE Innovation Park, Butterfield Business Park, Hatfield Business Park, Stevenage Bioscience Catalyst, Rothamstead Estate and Research Farm, Maylands Business Park in Hemel Hempstead, Elstree Studios, Leavesden Studios, Pinewood Studios, Westcott Venture Park, and Symmetry Park. The study area also covers a large proportion of the Chilterns Area of Outstanding Natural Beauty (AONB) and more rural communities.

Several regional and nationally significant road links are also included in the area, including the M1, A1(M) and the M40, as well as the north west portion of the M25. Key east west routes within the area comprise of the A414 and A505. Key rail lines include the Chiltern Main Line (CML), the East Coast Main Line (ECML), the West Coast Main Line (ECML), the West Anglia Main Line (WAML), the Midland Main Line (MML) and the Metropolitan Line.

Across the study area there are significant opportunities and potential for investment in transport that improves accessibility and connectivity across the area, helps to support better access to opportunities, especially in more deprived areas, while also contributing to improved air quality, safety, health and well-being, and to achieving net zero requirements.

This Final Summary Report provides an overview of this study, with additional detail contained in the supporting Evidence Base and Full Technical Reports.

Figure 1: Study Area



Study Aims

This study was developed by EEH with the support of consultants at Steer, WSP, and 5th Studio (collectively the 'project team').

The policy framework set out in the transport strategy is guided by four key principles that form part of how interventions were assessed and packaged as part of this connectivity study:

1. Achieving net zero no later than 2050, with an ambition to reach this by 2040.

2. Improving quality of life and wellbeing through a safe and inclusive transport system accessible to all which emphasises sustainable and active travel.
3. Supporting the regional economy by connecting people and businesses to markets and opportunities.
4. Efficient movement of people and goods through the region and to international gateways.

This report sets out the rationale for packages of interventions which will address the objectives and critical success factors developed for the study area. Its two key sections combine to form a pre-strategic programme outline case (SPOC):

Options Appraisal Process: This aligns with the strategic and economic dimensions within the Treasury's 'five case model' and Department for Transport's (DfT's) transport analysis guidance (TAG). This considered the context, current and future situation, a long list of interventions, and the development of packages aligned with the strategy.

Recommended Connectivity Plan: This consists of the combined packages of interventions and initial consideration at a strategic level how they could be implemented in terms of rationale for delivery (via a theory of change framework) and finance.

The overall method is summarised in Figure 2.

Stakeholder Engagement

Development of the connectivity study involved comprehensive engagement, including a public call for evidence, stakeholder workshops and the development and progress of the study was led by a Steering Group formed from a wide representation from across the study area.

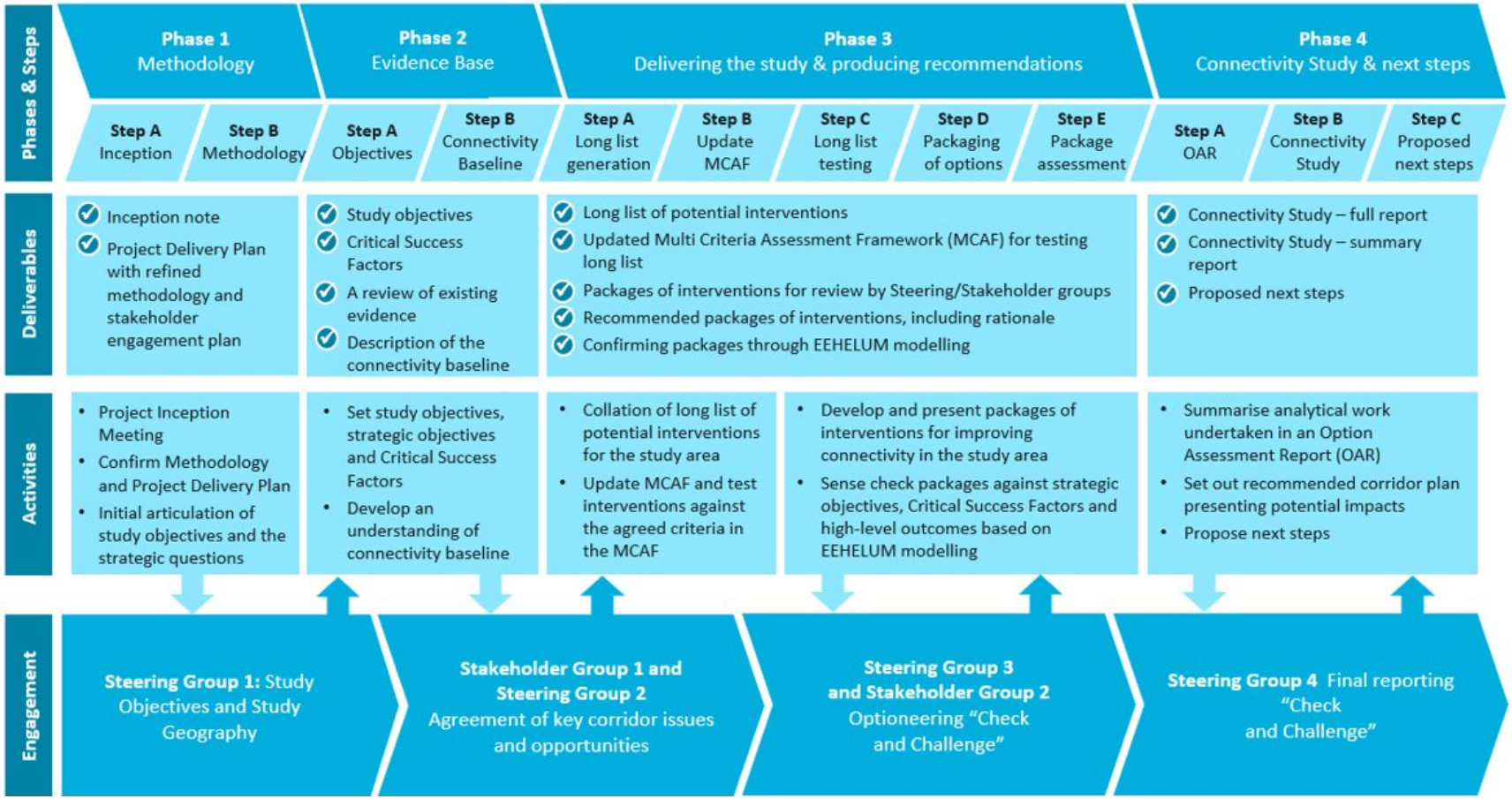
The project team worked collaboratively with stakeholders to develop the evidence base, identify possible interventions, and assess their likely impact and combine them into packages.

Stakeholder engagement and connectivity evidence were gathered through the following forums:

- **Steering group:** Virtual workshops with local authority planning, local enterprise partnerships and transport officers, alongside National Highways and Network Rail to gain local insights into connectivity issues and opportunities.
- **Stakeholder group**: Virtual workshops were undertaken with transport, place, and environmental stakeholder groups to gather insights on issues and opportunities and potential solutions. A number of topic specific 1:1 discussions were also held.
- **Call for evidence**: Gathering of further insights through an online survey, providing the opportunity for wider participation from members of the public businesses and interest groups in identifying key connectivity issues in the study area and potential interventions.

This was complemented by various subject matter experts from across Steer and WSP who were engaged to advise on identified interventions and assisting in capturing additional connectivity opportunities in the area.

Figure 2: Study Method



The Study Area

The study area (see Figure 1 on Page 5 above) is an attractive place to live, exhibiting diverse social characteristics, a strong economy and with relatively good transport connectivity compared to other parts of the United Kingdom. However, the nature of the study area results in complex social, economic and connectivity challenges to be addressed and opportunities to be maximised.

The study area contains some of the Heartland's important economic assets including the key settlements of High Wycombe, Aylesbury, Luton, Stevenage, Hemel Hempstead, Watford, St Albans, Welwyn Garden City and Hertford, as well as several universities and innovation clusters – including some of the most significant facilities and businesses associated with the film and television industries.

Transport movements in the study area are dominated by M1, A1(M) and the M40, providing connections to London as well as the north west portion of the M25. The east west highway links are limited to the A414 and A505. Key rail lines include the Chiltern Main Line (CML), the East Coast Main Line (ECML), the West Coast Main Line (ECML), the West Anglia Main Line (WAML), the Midland Main Line (MML) and the Metropolitan Line that provide extensive rail connectivity between London and rest of the UK. There are key differences in characteristics across the study area, such as dense urban populations compared to rural sparse populations, variation in income levels and employment and comparative access to key services and jobs by public transport. Improving connectivity and equality of access opportunity across the various socioeconomic groups while achieving net zero carbon emissions is a key challenge.

Whilst there are some key east west highway connections such as the A414, A505 and M25, there are limited passenger transport links or connectivity between the rail lines in the north and south by sustainable modes.

Where people live

The resident population in the study area is close two million people, with the largest urban settlement being Luton in the north, which has a population of 233,500[1]. This is almost twice the size of the next largest settlement in the area, Watford.

The larger settlements are generally located in the centre of the corridor and are in close proximity to each other, providing greater opportunity for inter-urban connectivity especially by public transport and active travel modes. The eastern and western parts of the study area consist of smaller settlements and areas of rurality.

The resident population of the study area grew by 9% between 2011 and 2021. Population growth at the periphery of existing urban areas presents challenges to sustainability as these areas are often longer distances from everyday services and amenities and are often less well connected by active and public transport, meaning high reliance on private vehicles or a lack of access to opportunity for those without access to a vehicle.

Most major settlements in the south of the study area, are 'dormitory towns'. These are commuter towns that principally serve London, and therefore have strong transport links to the capital. In commuter towns such as St. Albans and High Wycombe, rail travel is often the most popular mode of travel to work (with London being a notable origin or destination). In these settlements there may be opportunities to improve local sustainable travel links to major rail hubs to help improve first mile/last mile connectivity for local residents and the movement of freight.

[1] Figures quoted refer to the main built-up urban areas only as opposed to the larger local government boundary.

Some of the larger settlements in the study area are surrounded by sparsely populated more rural areas, for example the area to the west of Aylesbury, and the area to the east of Stevenage. This results in high levels of car dependency by people traveling to or from these areas as public transport options are often limited and active travel is not feasible even with the use of e-bikes.

Key Where People Live Challenges:

- The larger settlements have a higher concentration of services, amenities and employment opportunities, meaning that these areas generate high travel demand from the surrounding areas and transport options are largely limited to highway and rail.
- Lower population densities in the rural areas tend to increase car dependency due to it being less viable to run frequent bus or rail services without operational investment and historically limited investment in safe active travel routes.
- East west links based on more sustainable modes can be limited between settlements due to lack of rail lines and effective bus services with priority measures such as dedicated lanes. This lack of more sustainable travel options and high population density is likely to create high car dependence.

Where people work

The workplace population (those people in employment) of the study area in 2021 was approximately 1,021,000, which equates to approximately half of the overall EEH workplace population.

There is a large number of residents who commute out of the study area to destinations such as central London and Milton Keynes.

The settlement with the largest number of employees in the study area is Luton, with 103,500 employees. In respect to ethe number of employees, Hemel Hempstead has the second highest count of 94,800. Hemel Hempstead also has a comparatively high number of employees relative to its population, assumed to be in part because of the Maylands Business Park which includes major employers such as Amazon. Settlements of Aylesbury, High Wycombe, St Albans and Stevenage also generate in-commuting from surrounding residential areas with fewer employment opportunities.

Key Employment Challenges:

- It is necessary to improve transport links from all parts of the study area to key employment centres to unlock the potential economic benefits.
- To minimise the number of car trips, interventions must focus on ensuring there are sustainable travel options for access to key local employment destinations, as well as improving connectivity to regional travel hubs which provide linkages to wider employment opportunities via public transport or active travel.
- There is a high proportion of commuters in the residential populations in the study area, in settlements including Aylesbury, High Wycombe and St. Albans. This can result in high levels of car use between home locations and major regional rail hubs if no effective first mile/last mile options are available.

Community diversity

In comparison to England on average, the study area is economically and socially diverse. The average household income across the study area is £51,300 (salary before tax). This is higher than the average of the EEH region (£49,484) and notably higher than the average for England (£43,888).

There is a clear urban-rural divide in respect to relative deprivation, with a high level of deprivation concentrated in central urban areas and less deprived neighbourhoods in rural areas. The urban centres of Luton, Stevenage, Aylesbury, and parts of northern Watford experience higher levels of relative deprivation and are within the 10% most deprived areas in England.

The average income to house price ratio varies noticeably across the study area, with the south of the study area, closer to London, generally being much less affordable than the north. The affordability of housing is lowest around key settlements to the south and east of High Wycombe, east of Hemel Hempstead, Harpenden, and east of Stevenage. High house prices and incomes can also be found in Northaw and Cuffley to the north of London, as well as areas to the east of High Wycombe.

As such, for many people working in these areas housing will be unaffordable, prompting them to live in other more affordable settlements within and outside the study area. This has the potential to result in longer, car based, inter-urban commuting journeys.

Improvements to long distance public transport can make it more attractive for people to live further away from London and in turn potentially contribute to easing housing affordability and road network pressures, noting however that housing markets are complex and demand currently outstrips supply. Should people from outside of the study area purchase homes because of the improved connectivity, this can increase house prices.

Key Community Challenges:

- High levels of relative deprivation are observed in some parts of the study area. Improved public transport and walking, wheeling, and cycling infrastructure can help reduce relative deprivation by providing better access to employment opportunities and key services. It can also promote more positive health outcomes.
- The north-south and urban-rural disparity in average income level and housing affordability across the study area may present challenges in respect to successfully decarbonising transport and improving accessibility, as low carbon options will need to be affordable and provide an integrated accessible network across the geography.

Economic activity

The EEH region is the heart of UK's academic and commercial research sector. EEH has a clear strategy to enhance the area as an 'innovation powerhouse', building on the region's combination of scientific and cultural assets, resulting in a highly skilled workforce.

Within the study area, professional, scientific, and technical activities are the largest employer being higher than the average for England. Prominent industry hubs and business parks within the study area include centres for life sciences, retail/logistics, aviation and aerospace and the film industry.

To maximise the economic potential of key industries within the study area, interventions should focus on connecting centres of employment with a skilled workforce (for example, creating mass transit east-west connections to benefit those needing to travel across the region and or who lack direct rail services to make such journeys via London).

Opportunities may exist given the level of high-tech industries within the study area, as these professions may suggests the population could be more likely to be interested in new technology driven transport interventions. As such, these interventions may be particularly successful in the area.

The study area is a major contributor to the success of the region, contributing towards 40% of the EEH region's Gross Value Added (GVA).

'Real Estate Activities', 'Wholesale and Retail Trade', and 'Manufacturing' are the top three contributing factors (accounting for 14.9%, 13.7%, and 10.6% of the total GVA, respectively), demonstrating the popularity of the study area as a place of living as well as the importance of manufacturing and retail industry in the area such as Tesco HQ in Welwyn Garden City and Vauxhall in Luton.

Key Economic Activity Challenges:

- To maximise the economic potential of key industries within the study area and support decarbonisation, interventions should focus on better connecting existing and emerging industry hubs with a skilled workforce via more sustainable modes of transport, particularly those situated outside large urban areas.

Public transport services

The radial rail network within and passing through the area is extensive with a high number of north-south rail routes connecting with London. At present, east-west rail connectivity is limited and can require lengthy detours via London. For example, there is no direct rail or mass transit connection between Luton, Aylesbury, and Stevenage.

High station usage on the main railway lines shows that rail travel is an important mode of transport for the study area. Although there is a relatively high number of existing railway stations, connectivity to and between the stations remains an issue, particularly for east-west movements.

There is a clear rural-urban divide in respect of the frequency of bus services, with most existing high frequency bus routes also running north-south. Demand Responsive transport (DRT) pilot schemes have been established in North Herts, East Herts, Dacorum and Three Rivers (HertsLynx) and Buckinghamshire (PickMeUp) to serve surrounding rural communities where traditional bus services lack frequency due to less commercial viability.

Key Public Transport Challenges:

- Station usage varies across the area with the absence of rail stations in the north west likely to result in higher levels of dependency on private car.
- New high quality, direct and non-traditional east-west mass transit services could provide an attractive alternative to the private car.
- It is important that public transport times are competitive with that of car journeys, particularly for smaller settlements which currently have poor accessibility where interventions could be targeted.

Highway network and travel by car

Highway connectivity in the area comprises nationally significant routes that form part of the Strategic Road Network (SRN) managed by National Highways, the Major Road Network (MRN) managed by local authorities, and a large number of local roads.

Road transport movements in the study area are dominated by SRN routes of the A1 (M), M1, M25, and M40, apart from the M25 which provides connectivity towards London. East west strategic connectivity is limited to the Major Road Network A414 and A505 as apart from the M25 there is not a route forming part of the SRN that provides connectivity across the region and the lack for east west rail connectivity means that there is often no alternative for east west movements to the car.

Car dependency and mode choice is heavily influenced by the accessibility of everyday services and amenities by different transport modes. At present private cars provide much better accessibility for all trip purposes than public transport in the study area, with the vast majority of the area accessible from at least one key settlement within 60 minutes driving.

The catchment size of the private car is over double that of public transport, covering almost the entirety of the wider EEH zone region and the majority of the north of Greater London. Whilst it is acknowledged that the study area has relatively high rail use for commuting, for public transport to be an attractive alternative to private car travel for all trip purposes, it must provide more comparable journey times than is often currently the case.

The region provides important strategic routes for freight. The highest flows are on the major motorways including the M1, M25 and M40 with maximum flows reaching an average of greater than 10,000 HGV vehicles per day.

The A10, A505, A41 and A5 are examples of roads with HGV proportions exceeding 5% of local traffic. There are also significant HGV volumes in villages

accessing the SRN especially near the M25 in villages such as Iver. This remains an issue as such roads do not include the resilience for withstanding HGV breakdowns/accidents.

HGV freight movements remain a barrier for many of EEH's future sustainability principles due to high carbon emissions of existing vehicles and road safety concerns. There are opportunities to decarbonise freight movements throughout whilst acknowledging the economic importance of freight industries.

The distribution of Electric Vehicle Charging Points (EVCP) shows a clear urban-rural divide being concentrated in Watford (13%), Luton (10%), Welwyn Hatfield (8%) and East Hertfordshire (7%). Clusters of EVCP can also be found in Aylesbury, High Wycombe and Stevenage.

Reported collision data reveals that the number of Personal Injury Accidents (PIA) generally increases around large urban areas, with the highest concentration occurring around Aylesbury, Luton, and Watford. Many PIAs have been recorded on the M1 between Watford and Luton, as well as along the M25 between Uxbridge and Potters Bar, with most of the accidents having taken place close to junctions.

Key Highway Challenges:

- High car dependency can be linked to a number of factors including lack of infrastructure or funding to support public transport or walking and cycling alternatives or settlements and amenities largely being developed which are heavily weighted to single occupancy car use only.
- Smaller settlements and rural communities have limited access to alternative transport modes than more urban areas.
- Public EV charging infrastructure deployment is favored in towns and cities rather than in rural areas.
- Whilst road haulage is essential to the growth and success of businesses in the study area it is important that any adverse impacts on the environment and local communities are minimised as far as possible.
- Safety challenges are presented by relatively high-volume, high-speed highway infrastructure.

Active travel

At present, cycling to work is most common in dense urban centres, for example in the centre of Luton and Aylesbury. The distribution of strategic active travel infrastructure throughout the study area varies.

There are strategic connections utilising old railway lines between Luton and Harpenden, St Albans and Hatfield (Alban Way) and Welwyn Garden City and Hertford (Cole Green Way).

A number of medium size settlements are poorly connected by active travel routes, notably High Wycombe and surrounding settlements. This potentially limits opportunities for users to undertake medium and long distance trips by cycle or other micro-mobility modes (for example using e-bikes).

There are opportunities for new inter-urban active travel routes to be developed between settlements, such as former rail alignments that are active travel routes in Hertfordshire. Micro-mobility modes are small lightweight personal vehicles such as e-bikes and e-scooters and are becoming increasing popular for first mile/last mile journeys. Buckinghamshire Council has a scheme operating in High Wycombe, Princes Risborough and Aylesbury, with ebikes also available in Watford and Borehamwood and an ebike scheme is being developed in Hemel Hempstead. It should be noted that e-scooters are illegal to use on public roads unless part of UK Government trials.

Key Active Travel Challenges:

- To help facilitate longer-distance sustainable movements it is important that active travel networks provide high quality local connections between rail stations and residential and employment areas.
- Despite large populations, no micro-mobility schemes have been identified in Luton, Hemel Hempstead, St Albans or Stevenage.

Strategic Mobility Hubs

The study area already benefits from several strategic mobility hubs allowing easier transfer between different modes of travel. Notable amongst these are locations such as the University of Hertfordshire's Park & Ride and bus-rail interchange facilities in centres such as Watford which provide private car users with the ability to avoid driving into central areas by connecting with reliable bus services.

London Luton Airport Parkway is another notable local mobility hub example, providing direct access via the Luton DART system (Direct Air-Rail Transit) to the airport and rail connections with London and the north via Midland Main Line services. It also provides large numbers of cycle parking spaces, connects with multiple local bus services, and provides amenities and a small retail offer. **Mobility hubs are important strategic transport nodes** that reflect the needs of the local community, respond to local geography, and maximise opportunities for users to choose more sustainable modes for all or part of a given journey.

Key Mobility Hub Challenges:

- Many potential mobility hubs and similar facilities have sought to avoid private cars travelling into busier urban areas rather than maximising their ability to facilitate more sustainable strategic and local journeys across all relevant modes for that location.
- Naming sites as "Park & Ride" and focusing their design on large car parks, while useful for private vehicle drivers, could limit their potential to be valuable strategic hubs for all types of travel and user.
- Many areas that could benefit from a hub to transfer between modes (for example, quality walking and cycling routes, and provision of cycle parking to facilitate transfer with local and intercity bus services) do not currently have facilities like toilets or e-cycle charging.

Digital connectivity

Since the COVID-19 pandemic there has been a significant increase in the number of people working from home and an increased importance in good digital connectivity. It is also leading to changes in the way that offices are structured.

Digital connectivity varies across the study area, where there is a clear urban-rural split with the larger

key settlements having the highest proportion of Gigabit availability, for example within Luton, Watford, St. Albans, and Stevenage. Whereas more rural areas like Puckeridge and Naphill can be seen to have the lower coverage.

For mobile connectivity, the UK's four mobile network operators are currently rolling out 5G services, which offer higher speeds and lower latency. The "EEH Working from Home Propensity and Capacity Release" report outlines through using the Capacity Release Model estimates that remote and hybrid working could result in a 12% reduction in traffic congestion for the study area.

Improved digital connectivity, particularly in rural areas like Eaton Bray, further from the main urban centres where the lowest coverage of connectivity can be found, will help facilitate the adoption of agile and hybrid working practices.

Key Digital Connectivity Challenges:

- Digital connectivity is highly variable across the study area.
- Working from home varies across the study area – those who cannot work from home are reliant upon physically being present and create requirements to travel.

Landscape and Protected Areas

The Chilterns is an Area of Outstanding Natural Beauty that spans from High Wycombe to Hitchin.

The eastern part of the study area along the River Lea is particularly susceptible to flooding, with small pockets in the north-west of the study area, especially the land surrounding Aylesbury, being susceptible to flooding.

There are numerous protected areas within the study area. A large proportion of the study area is encompassed within the green belt spanning from High Wycombe to Stevenage. This has a substantial influence on the location of planned growth in the study area.

A large proportion of listed buildings are situated in the surrounding areas of Stevenage, particularly to the north.

Key Natural Landscape Challenges:

- The delivery of large-scale infrastructure improvements may be challenging due to the potential flood risk.
- The Greenbelt has a substantial influence on the location of planned growth, and the resultant connectivity requirements.
- Protected areas within the study area may hinder the delivery of new large scale transport infrastructure.

Emissions and air quality

To address the UK's Greenhouse Gas (GHG) emissions the Government set a legally binding target to reach net zero carbon emissions by 2050, with a reduction of 78% required by 2035. As part of this there is a need for decarbonisation and or electrification of the national vehicle fleet.

In 2019, the total amount of CO2 (Carbon Dioxide) emissions from road-based sources by local authorities in the study area was 4,147 KTCO2e, equating to 41% of all the road-based CO2 emissions in the EEH region as a whole.

The highest road-based carbon emissions can be found along the major motorways within the study area including the M1, M25 and M40. Key settlements and radial A-roads also reveal significant carbon emissions including through Watford, Hemel Hempstead, and Luton.

There is a key challenge in balancing the local environmental impact of London Luton Airport, against its proposed expansion, with its economic importance. This is also applicable to Stansted Airport, which provides significant economic benefit to East Hertfordshire, but has environmental concern particularly for settlements such as Bishop's Stortford.

Areas of poor air quality can be identified from the location of Air Quality Management Area (AQMAs). There are a total of 48 AQMAs within the study area, representing a total of 53% of the AQMAs within the EEH region.

Many AQMAs can be found on the southern border of the study area surrounding the M25 and M1. A relatively large number of AQMAs can also be found surrounding the M40.

Key Emissions and Air Quality Challenges:

- AQMAs highlight the severity of air quality issues in the study area. AQMAs associated with the strategic road network are challenging to address as these roads support longer distance through trips.
- Encouraging behaviour change and modal shift towards sustainable modes.
- Greening of public and private vehicle fleets in areas where active travel is not feasible and public transport services are not commercially viable.
- There is a need to address high transport carbon emissions throughout the EEH region, high car dependency and traditional combustion engine travel creates heavy carbon emissions.
- The use of alternative fuel vehicles, in particular for HGVs, and a transition to sustainable modes can help with reducing the total carbon emissions.

Key Opportunities and Need for Intervention

The current challenges facing the study area are primarily due to dominant radial routes passing through the area and uncertainty of what capacity may be unlocked by new infrastructure such as HS2. In addition, there are a range of rural and inter-urban connectivity challenges within the study area.

Reinforcing the region's role as an economic and innovation powerhouse, while also meeting the requirement to reach net zero emissions by 2050 (at the latest), creates a range of opportunities set out in Figure 3.

Figure 3: Key Opportunities for the Study Area

Mass Rapid Transit

The HERT scheme proposed mass rapid transit connection between Hemel Hempstead, St. Albans, Hatfield/Welwyn Garden City, Hertford/Ware and Harlow (and onward connections to Stansted Airport) is a significant opportunity to promote high quality sustainable transport within the study area and decarbonise the transport system.

Shared mobility services

Further expansion of shared mobility schemes can help offer affordable and attractive access to active travel opportunities to replace car travel and update interchanges to improve public transport journey times and reliability.

Rail improvements

Disused railway lines in the area, for example the Watford to Croxley Branch line, present a great opportunity to implement new sustainable travel links including designated active travel greenways, or direct bus rapid transit links.

Sustainable first/last mile and rail freight

Greater use of consolidation, walking and cycling freight options combined with rail-based transport and freight interchanges can help move freight transport away from traditional HGV road-based movements.

Pinch point improvements

Highway improvement schemes focussed on key strategic locations which would reduce rat running on local roads.

Strategic mobility hubs

Combining public transport, active travel and demand responsive services in hubs can help to reduce difficulties of linking travel between different transport modes and encourage more sustainable travel choices.

Urban active travel improvements

Infrastructure improvements to include better priority and segregation for active travel modes to help promote safer and more attractive active travel patterns can help reduce car dominance in urban centres and reduce carbon emissions.

Study Objectives

Figure 4 details the **objectives established with stakeholders for the study area** based on the evidence base and issues and opportunities identified. These are centred around the four key strategic principles set out in England's Economic Heartland's Transport Strategy.

Figure 4: Study Objectives

Key Principles from EEH's Transport Strategy			
Achieving net zero no later than 2050, with ambition to reach this by 2040.	*Improving quality of life and wellbeing through a safe and inclusive transport system which emphasises sustainable and active travel.*	*Supporting the regional economy by connecting people and business to markets and opportunities.*	*Efficient movement of people and goods through the region and to international gateways.*
Objectives for the study area			
1a – Harness innovation to reduce all emissions including carbon and manage transport demand to make more efficient use of existing network capacity **1b** – Promote and enable the use of more sustainable travel modes and transport technologies	**2a** – Create a transport network that reduces car dependency and provides comprehensive, equitable, and sustainable access to services and opportunities for all **2b** – Improve public health and individual wellbeing outcomes by minimising road traffic danger, and transport-related air and noise pollution	**3a** – Better connect people and businesses through sustainable modes to help create more employment, innovation, and collaboration opportunities **3b** – Ensure planned development is part of a well-connected, sustainable, and accessible transport network	**4a** – Enable efficient, safe and sustainable movement of people and goods through the study area and to key international gateways, ensuring impacts on local communities from freight traffic are minimised **4b** – Facilitate sustainable first mile/last mile connectivity for people and goods in both urban and rural areas

Critical Success Factors

To help shape the development of this Connectivity Study and the development of a long list of transport interventions for the study area, **nine critical success factors were identified** to provide an articulation of the need for intervention. They also helped to bring specificity around the outcomes that need to be achieved through the study without defining what specific interventions are required for achieving those outcomes. These Critical Success Factors were:

1. The carbon emissions from transport are reduced to net zero with an ambition to reach this by 2040.
2. Improved digital infrastructure reduces the need to travel.
3. A high-quality, sustainable, integrated and accessible transport network connects all places of strategic importance.
4. Improved transport connectivity enables sustainable and high-quality planned development that improve accessibility and links to improved quality of life.
5. Rural communities are well connected to services and opportunities by a safe and reliable public transport network.
6. Everyone can access the benefits of new and improved technologies (e.g. shared electric vehicle services).
7. The benefits of new strategic/major infrastructure are maximised for the whole study geography (e.g. HS2 creates freight capacity on the WCML).
8. The transport network enables safe and sustainable distribution of goods within and through the area via appropriate routes.
9. There is a substantial increase in active travel mode share for local and first mile/last mile journeys, contributing to better connectivity, increased health benefits through increasing physical activity and improved air quality.

Scenario Planning

The Department for Transport's Uncertainty Toolkit identifies the need to consider future uncertainty in the transport network during the appraisal process and scenario planning is increasingly viewed as good practice in long-range planning given uncertainty about the future.

To ensure that each Connectivity Study has been developed in such a way that allows for a good level of resilience to potential future changes in travel patterns, a set of "**Alternative Futures**" were developed at an EEH region level, led by technical specialists, and informed by stakeholder input:

- **Radical Change**: high government spend, radical change in policy to support improved health and decarbonisation and a resilient economy.
- **High Tech**: positive public and government attitudes towards technological change, high levels of home working, lower overall and peak travel demand, reduced demand for traditional public transport and private car ownership.
- **Slow Recovery**: slow return to the pre-Covid business-as-usual and an economy vulnerable to economic shocks, fewer journeys for all trip types, across all modes especially peak time.

Completing these are "**Infrastructure Scenarios**" developed with stakeholders to represent different approaches to intervention planning that could contribute to realising our vision and addressing the objectives and critical success factors of this study.

Through a shortlisting process known as Multi Criteria Assessment Framework (MCAF), potential interventions were then assessed in the context of the Alternative Futures and Infrastructure Scenarios with the purpose of considering if any interventions which were assessed as being borderline under a Business-as-Usual state would be more appropriate recommend under an alternative future(s).

They were also assessed to help ensure the packages were resilient to different potential future states.

Intervention Identification and Assessment

An initial long list of potential interventions and options was developed **from a wide range of sources**, including input from the project team, Steering Group, Stakeholder Group, Call for Evidence and subject matter experts, with additional desk research also undertaken. This included a review of local transport planning policy documents as well as a review of the challenges and opportunities identified in the evidence base.

In total, **283 'potential' interventions** were included in the long list. From these 283 potential interventions options were then excluded if they:

- Did not primarily address movement within the study area.
- Were not considered to be at sufficient scale to have regional significance (i.e., a specific, small-scale cycle intervention) – note that many small-scale interventions are covered by wider regional interventions.
- Are a committed intervention (schemes where construction had already started or those with identified funding and a clear delivery timescale).
- Did not pass a basic 'common sense' feasibility test (i.e., if they were based on an unproven technology) (e.g., Hyperloop).

From this initial assessment, a total of 182 potential interventions were excluded. The reasons for exclusion ranged from the scheme already being committed or delivered, being a duplicate, not supporting strategic movements in the study area, being addressed as part of another connectivity study, through to not being in the study area.

The remaining 101 potential interventions then progressed to detailed assessment.

Multi-Criteria Assessment

A multi-criteria assessment framework (MCAF) was developed based on DfT's Early Assessment and Sifting Tool (EAST) Guidance and used as an early assessment and sifting tool for this study.

The MCAF was used to sift out options that perform poorly, and to organise and compare options to help develop coherent packages of interventions. For each option, they were assessed against three different types of criteria:

- **The Strategic Dimension**: How well each option contributes to achieving the study's principles and objectives and how well it is aligned with national, EEH and local policy.
- **The Economic Dimension**: The nature and scale of the economic, environmental, and social impacts of each option.
- **The Deliverability Dimension**: The deliverability of each option, specifically: An options financial case (likely cost and affordability), an options deliverability / management case (timescale, technical complexity and acceptability) and the quality of supporting evidence.

The MCAF does not provide an overall score or rank for each option assessed. Instead, professional judgement has been used to establish a criteria scores for each potential intervention.

A **technical review** of the assessment process was undertaken by the project team at several stages of the assessment. This ensured that the assessors were both adhering to the principles outlined within EAST guidance in particular.

Stakeholder moderation was also facilitated with initial MCAF assessment results reviewed by EEH and shared with the steering and stakeholder groups. Consideration was given to suggested changes and where appropriate results updated.

Packaging of Interventions

Following assessment of the 101 potential interventions against the MCAF, the project team worked with key stakeholders and technical advisors to develop a set of coherent packages that together will help realise our vision based on the objectives defined for the study while also reinforcing the region's position as an economic and innovation powerhouse.

These packages have been developed through workshops, discussions, and careful analysis of results of the assessment of the long list of possible interventions described in the preceding section. The inputs informing package development are summarised in Figure 5 below:

Figure 5: Inputs Informing Package Development

The packages combine consideration of the EEH's Transport Strategy, study specific sub-objectives, Critical Success Factors and Infrastructure Scenarios, expert advice, stakeholder and officer feedback.

This 'vision led' approach was then combined with the individual assessment of the long list, with interventions not taken forward at this time deemed as 'parked'.

A proposed intervention may be parked for a wide range of reasons, and this should only be seen as EEH not taking it forward as part of this Connectivity Study. An intervention could be supported at a later stage (such as part of a future EEH study or council project) should circumstances or priorities in the area change. Following this assessment, the 101 interventions were reduced down to a total of 82.

Based on insights from previous Connectivity Studies in the programme, it was decided that priority should be given to the following four ways of grouping the 82 interventions in order to more accurately reflect the multi-modal nature of transport infrastructure:

1. Around a single location (for example, a coherent urban area);
2. An existing or potential transportation corridor (for example, along a rail service or motorway route)
3. Based around common types of locations (for example, science parks or market towns); and
4. By mode type or other characteristic (for example, freight or electrification).

Phasing and Indicative Timeframes

Based on stakeholder input from the Infrastructure Scenario development, intervention phasing was considered in three key time periods:

- **Short term** schemes were judged to have a construction start date between 2025 and 2032 with benefits beginning to be accrued within this timescale.
- **Medium term** schemes were judged to have a construction start date between 2033 and 2040.
- **Long term** schemes were judged to have a construction start date from 2041 onwards.

The indicative timeframe for each intervention is included as part of the full list in Appendix A.

Recommended Connectivity Plan

This study recommends **82 interventions** to achieve a step change in connectivity for the area (full list of included in Appendix A).

These have been **grouped into five packages** that together will help to realise our Transport Strategy vision:

1. **Aylesbury – Luton – Stevenage** - Enhanced interurban connectivity centred on significantly improved bus connectivity and expansion of the Luton-Dunstable Busway services.
2. **Amersham – Watford – St Albans** - Enhanced urban connectivity centred on provision of new rail and improved bus connectivity.
3. **Hemel Hempstead – St Albans – Stansted** - Facilitation of the Hertfordshire Essex Rapid Transit (HERT) scheme and associated projects and connectivity benefits.
4. **Sustainable Rural and Freight Connectivity** - Better connecting market towns and rural areas through improved transport choice and partnering with the private sector to ensure freight uses the right parts of the network, as well as securing the future of regional freight terminals.
5. **Creating an Integrated Transport Network** - Better integrating modes and reducing their overall cost and impact on the environment to encourage multi-modal journeys that more sustainably meet individual travel needs.

In addition to **reducing car dependency and providing significantly improved access to employment and education opportunities** across and beyond the study area, the logic and benefits of each package was also confirmed through modelling using EEH's Economy Land Use Model (EEHULUM), a high-level model that simulates transport, people, employers, and land use interaction over time.

Compared to a business-as-usual baseline, the EEHULUM results show that if implemented in full, the recommended connectivity plan could achieve the following step change each weekday by 2049 compared to the business-as-usual baseline:

- **80,000 fewer journeys by car and other private vehicles;**
- **45,000 more journeys by bus or on the HERT;**
- **85,000 more trips made by walking, wheeling, or cycling; and**
- **5,000 more journeys by train.**

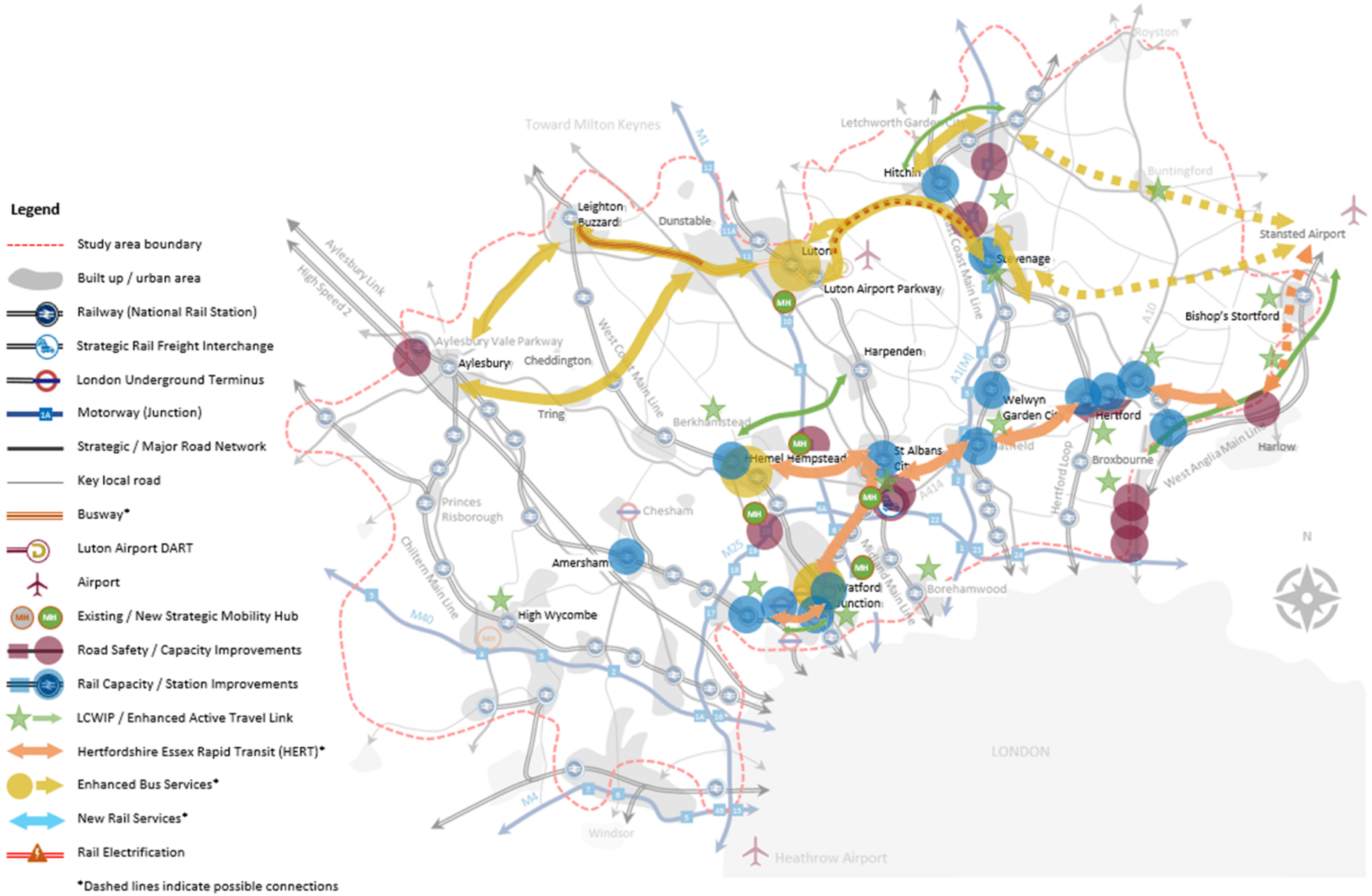
While further detailed work on costs and benefits will be undertaken as schemes are progressed by relevant authorities, the indicative capital investment required to deliver this plan is £4.3 billion, with estimated annual maintenance and renewal requirements of £280 million, over 30 years.

By 2049 this investment could deliver the following for the area compared to the business-as-usual baseline:

- **22 KTCO2e less CO2e emitted per year;**
- **3,800 additional new jobs created;**
- **£600 million in Gross Value Added (GVA) per annum; and**
- **1,400 additional new residents.**

This ambitious plan will help us deliver our Transport Strategy vision. EEH will continue to lead on delivery of the investment pipeline, working with officers and the Strategic Transport Leadership Board to scope its onward development.

Recommended Connectivity Plan Summary Map



Package 1: Aylesbury – Luton – Stevenage

The focus of this first package is on ***enhanced interurban connectivity centred on significantly improved bus connectivity and expansion of the Luton-Dunstable Busway services.***

Recommended interventions build on existing services and infrastructure to create a northern east-west transit route connecting key urban areas and radial rail connections to and from London. This route will be complemented by East West Rail to the north and the HERT to the south, to create a more comprehensive and integrated regional network.

Central to the route is the expansion of the Luton-Dunstable Busway services to the west to Leighton Buzzard and provision for Bus Rapid Transit Services east as far as Stevenage (via Hitchin), with the option for services to extend further to major origin and destination locations such as Stansted Airport. The measures will also help reduce road congestion and car dependency, including by providing for improved connections with London Luton Airport.

Benefits of this package are expected to include:

- **Expanded busway to provide faster and more frequent services** by taking current and enhanced services off local roads through the use of dedicated infrastructure, including possible use of former railway alignments;
- **Bus priority measures and dedicated lanes** that will make bus journey times less prone to variation and disruption through initiatives that prioritise buses and make best use of existing roads; and
- **Enhanced bus services and active travel connections** by making it easier to access an increased number of buses with longer operating hours, through improvements to local walking, wheeling and cycling infrastructure.

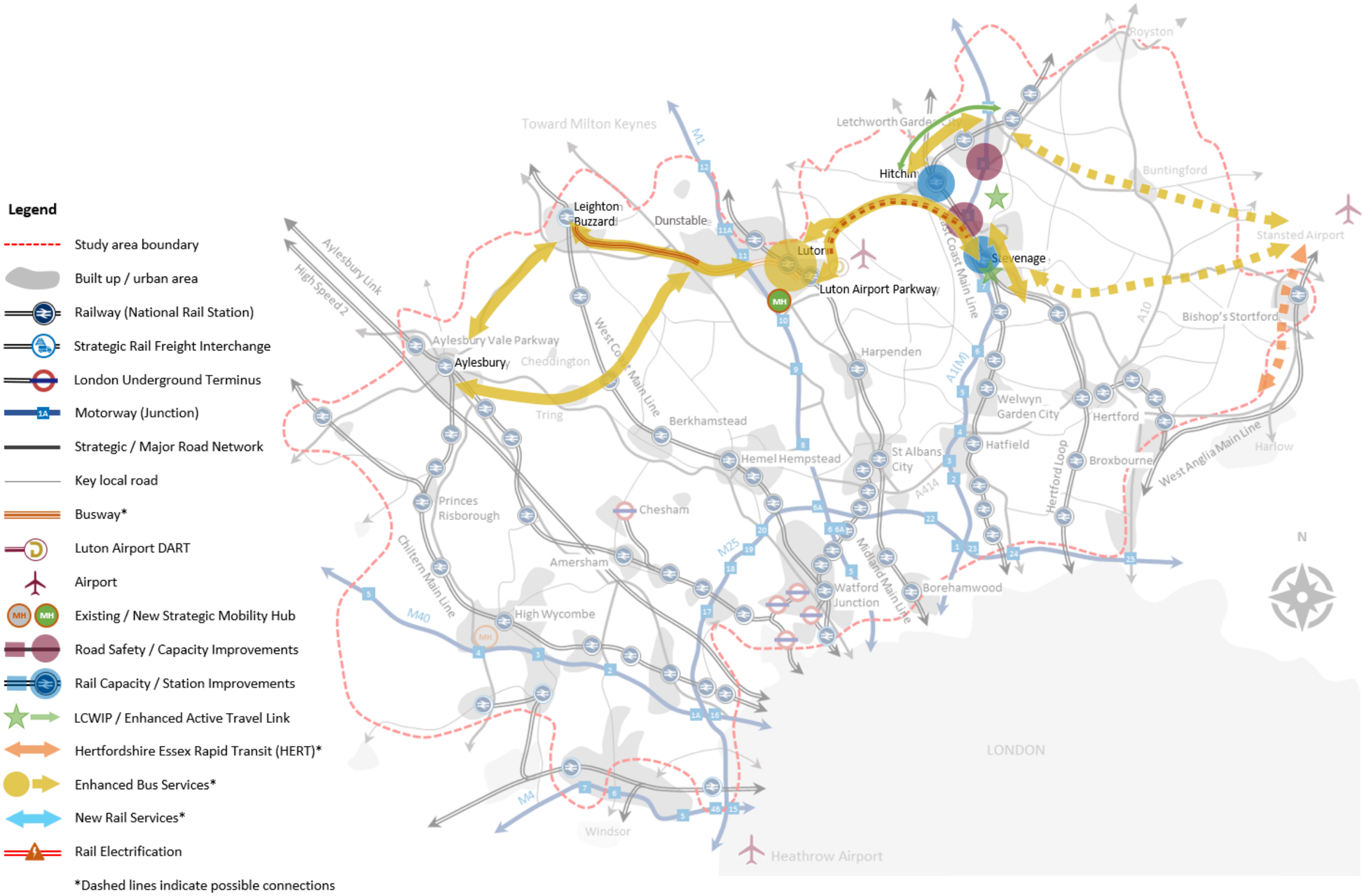
Key links to other packages include:

- **Complementing bus service rural improvements**, notably those recommended in the concurrent Thames Valley - Northampton Connectivity Study (Study 4) for rural Buckinghamshire and West Northamptonshire, in particular services to and from Aylesbury and connecting to Leighton Buzzard;
- **Measures to create a more integrated network** such as improved alignment between bus and rail services (Package 5) and integrated ticketing (Package 5) will help build additional demand for enhanced bus services and strengthen business case and funding applications; and
- **Expansion of rural on-demand and non-timetabled services** such as community transport (Package 4) will provide more options for users of bus and rail services to make multi-modal journeys and avoid driving.

To ensure delivery of interventions aligns with our Transport Strategy vision of net zero carbon by 2050 at the latest, consideration needs to be given to:

1. Development of enhanced bus services, priority measures, and dedicated routes should be undertaken together to ensure existing infrastructure is best used and that there is the strongest case for new infrastructure;
2. A future network plan being developed to give long term certainty to decision-makers and users, as well as employers and developers, with priority measures and dedicated routes such as busways then delivered in stages as funding becomes available; and
3. Proprietary and or bespoke technologies should be avoided where possible to ensure maximum use, coverage and longevity of systems for the public.

Package 1 Summary Map



Package 2: Amersham – Watford – St Albans

The focus of this second package is on ***enhanced urban connectivity centred on provision of new rail and improved bus connectivity***.

This will deliver a step change in connectivity between the St Albans area and communities serviced by the Chiltern Main Line and Metropolitan Line through making better use of the Abbey Line and former Croxley to Watford Junction rail alignments. Enhanced passenger transport service frequencies, journey times and accessibility will be delivered through connecting these areas as part of the south western branch of the Hertfordshire Essex Rapid Transit scheme.

Combined with a growing network of strategic mobility hubs connected with improved bus, walking, wheeling and cycling routes, as well as railway station improvements, this package will allow more trips to be made in whole or part by active travel and public transport.

Benefits of this package are expected to include:

- **Substantially improved connectivity with the south western branch of HERT** providing a significantly enhanced level of east west connectivity for communities such as St Albans, Watford, Croxley, Amersham, and many others in between compared to existing bus and rail services;
- **Exploring options for better integration as part of a new regional mass transit** (HERT); and
- **Reduced road congestion on key and local routes** through development of additional strategic mobility hubs that will provide an alternative to large number of single or low occupancy vehicles travelling on routes better suited to enhanced bus services or the HERT scheme.

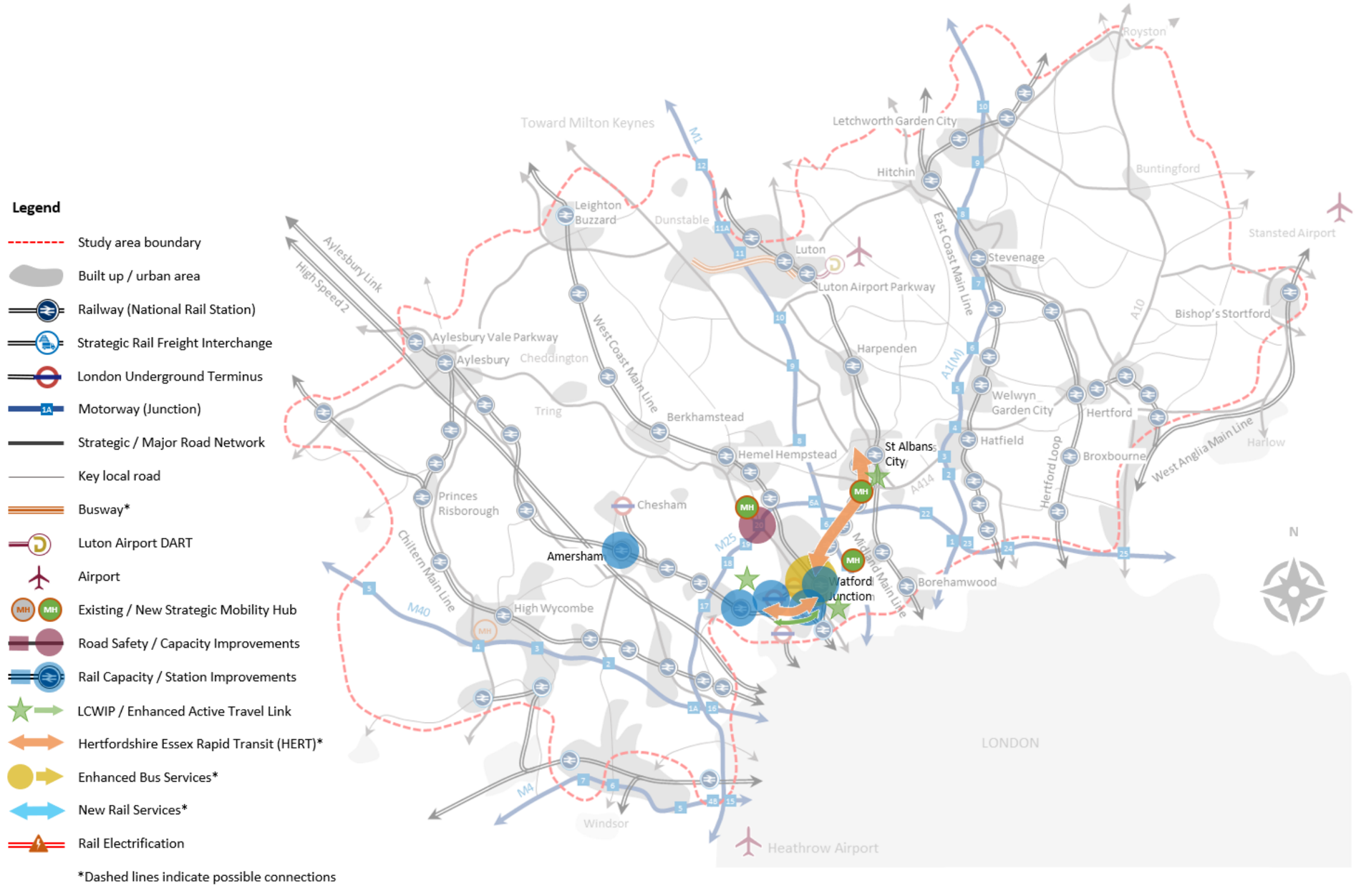
Key links to other packages include:

- **HERT core route between Hemel Hempstead and Hertford** (Package 3) with connections provided between Croxley, Watford and St Albans via the Watford to Croxley Link and Abbey line. Ensuring good quality connections to HERT via bus, rail, cycle and walking to key stops (e.g. mobility hubs) is at the centre of an integrated transport system and maximises benefits for those living in the areas along its route.
- **Expanded network of strategic mobility hubs** (Package 3) that incorporate expanded charging infrastructure of electric and alternative fuel vehicles (Package 5) and opportunities for car drivers to switch to more sustainable modes for the first mile/last mile will provide vital hubs for improved bus and HERT services, encouraging more efficient use of existing roads; and
- **Integrated ticketing between bus, rail and HERT services** (Package 5) will help to provide more seamless connections and reduce barriers to use.

To ensure delivery of interventions aligns with our Transport Strategy vision of net zero carbon by 2050 at the latest, consideration needs to be given to:

1. HERT routes being confirmed and included in all relevant local and national planning documents to provide long term certainty (similar to Crossrail safeguarding) and ensuring ongoing complementary decision making that reinforces the overall business case over time;
2. Ensuring HERT routes include active travel links where possible to maximise community benefit and minimise disruption from construction; and
3. Proprietary and or bespoke technologies should be avoided where possible to ensure maximum interoperability of staff and equipment, and to avoid the risk of high costs being locked in.

Package 2 Summary Map



Package 3: Hemel Hempstead – St Albans – Stansted

The focus of this third package is on ***facilitation of the Hertfordshire Essex Rapid Transit (HERT) scheme and associated projects and connectivity benefits***.

Interventions in this package will provide a new standard of public transport connectivity and reduce the need for those travelling east-west to avoid travel into and then out of London by providing a regionally significant public transport connection between the West Coast Main Line, East Coast Main Line, West Anglia Main Line and Midland Mainline with the HERT scheme.

The package includes schemes to deliver the HERT service and overall improve reliability and journey times for public transport on the A414 corridor. The proposed HERT route between Hemel Hempstead, Harlow and Gilston Garden Town is the main east-west section of the scheme and will serve the main settlements in-between. It will also improve connections to and from London Luton and Stansted Airports via interchange in St Albans and Harlow.

Benefits of this package are expected to include:

- **Substantially improved connectivity with the core HERT route** providing a significantly enhanced level of east west connectivity for communities between Hemel Hempstead and Harlow and Gilston Garden Town;
- **Reduced public transport journey times on the A414 corridor** through bus priority measures and junction improvements from the MRN programme that also provide a balanced package of measures including improving access for people across the A10 and provision of links between the northern and southern railway lines; and
- **More trips made in whole or part by active travel or public transport**, with journeys and multimodal interchange supported by a growing network of strategic mobility hubs and railway station improvements.

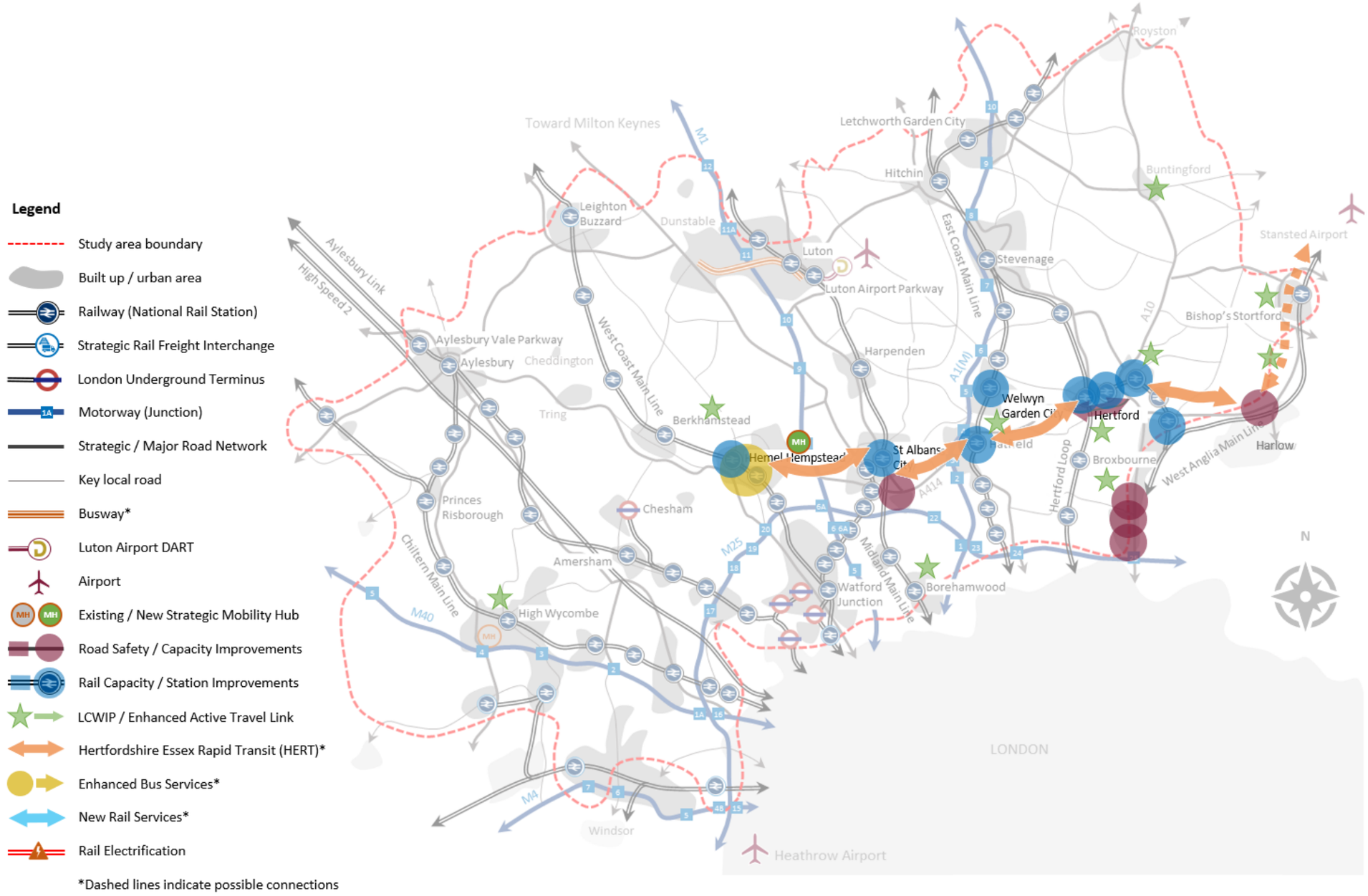
Key links to other packages include:

- **South western branch of HERT to Watford with connections to Amersham** (Package 2) will operate between St Albans, Watford and Croxley via the existing Abbey Line and former Watford-Croxley rail alignment with connections to upgraded railway stations such as Amersham and a growing network of strategic mobility hubs further boosting the HERT business cases;
- **Junction, active travel, and public transport improvements on the HERT route** (Package 2 and 4) will support the case and operation of HERT services, making it more connected and appealing for potential users; and
- **Integrated ticketing between bus, rail and HERT services** (Package 5) will help to provide more seamless connections and reduce barriers to use.

To ensure delivery of interventions aligns with our Transport Strategy vision of net zero carbon by 2050 at the latest, consideration needs to be given to:

1. HERT routes being considered and reviewed in relevant planning policy documents to ensure ongoing complementary decision making by governments, potential users and the private sector that reinforces the overall business case over time;
2. Ensuring HERT routes include active travel links where possible to maximise community benefit and minimise disruption from construction, with good quality connections to HERT when fully operational via bus, rail, cycle and walking to key stops; and
3. Proprietary and or bespoke technologies should be avoided where possible to ensure maximum interoperability of staff and equipment, and to avoid the risk of high costs longer term being locked in at taxpayer expense.

Package 3 Summary Map



Package 4: Sustainable Rural and Freight Connectivity

The focus of this fourth package is on ***better connecting market towns and rural areas through improved transport choice and partnering with the private sector to ensure freight uses the right parts of the network, as well as securing the future of regional freight terminals.***

Supported by the growing network of strategic mobility hubs across the region, rural areas with higher car dependency will benefit from improved and expanded network of active travel routes, including options to consider using former rail alignment and or construction service roads where possible (for example, those used to develop HS2).

Complementing this, moving more freight journeys to rail will reduce emissions and make better use of available road capacity, with well-designed new intermodal freight facilities having potential to support this goal and complement electrification of the Chiltern Main Line as recommended in Study 4.

Benefits of this package are expected to include:

- **Reduced pressure on local roads** through moving more passenger trips to walking and cycling (including increased use of e-bikes for longer trips and those with additional mobility needs) and encouraging HGV vehicles to use designated strategic routes and or transfer to rail services;
- **Reinforcing the important economic role of freight movements** within and through the region for the regional and national economies and supporting responsible development of rail freight interchanges; and
- **Improved public health outcomes for rural communities** through providing infrastructure and services that will support the reduction of dangerous local road conditions, congestion, noise and air pollution.

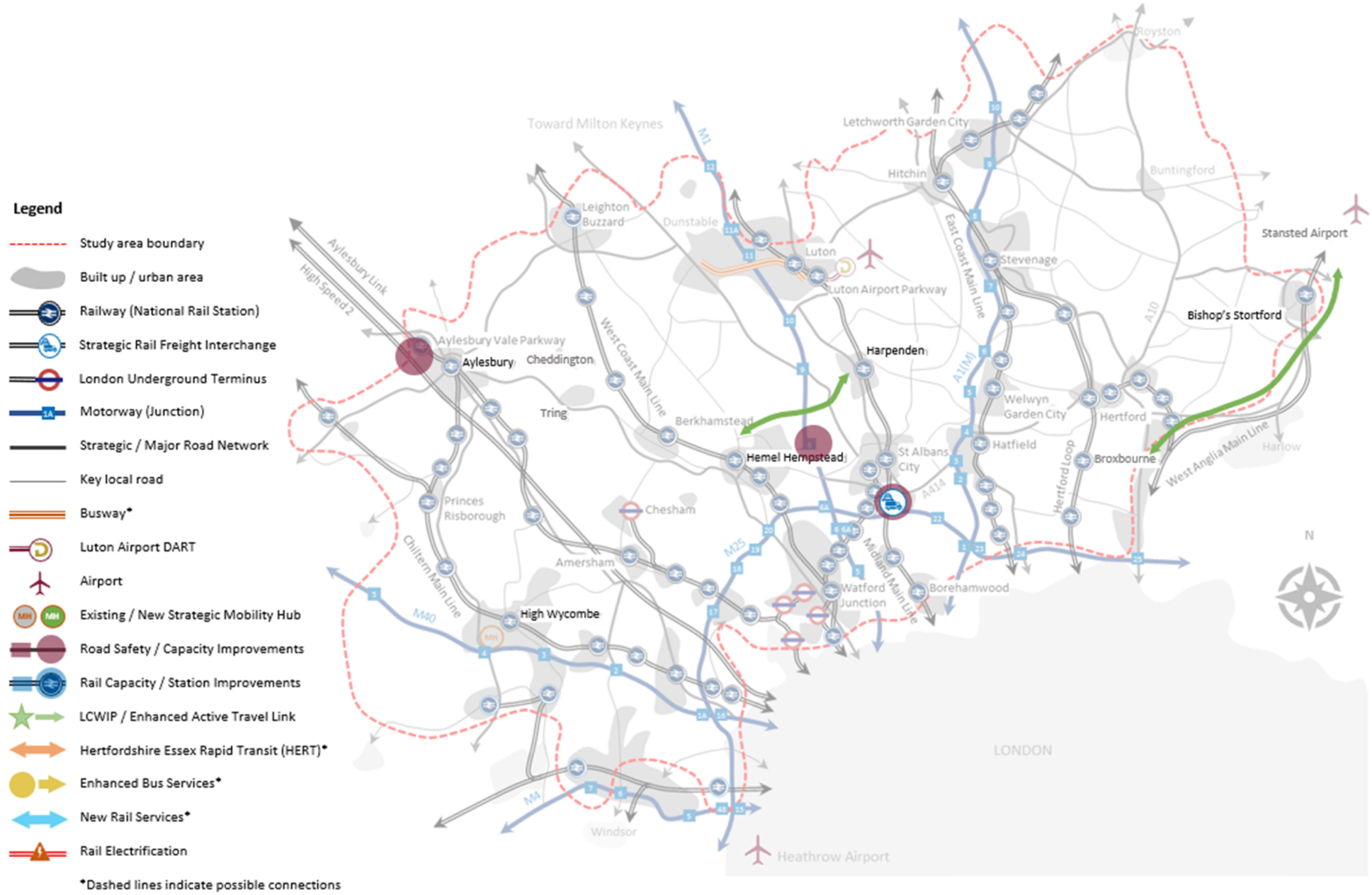
Key links to other packages include:

- **Enhanced First Mile / Last Mile Sustainable Freight Delivery** (Package 5) will both be able to benefit from improved walking, wheeling and cycling infrastructure, but also provide ways to reduce the overall impact from delivery vehicles such as vans and trucks through exploration of initiatives such as consolidation centres;
- **HERT services will provide a new spine of public transport connectivity** (Packages 2 and 3) that will provide those traveling to and from rural areas with a substantial step - change in east west connectivity through enhanced bus, walking and cycling connections to it through mobility hubs, while alleviating road congestion on the A414 that will benefit freight trips; and
- **Integrated ticketing between bus, rail and HERT services** (Package 5) will help to provide more seamless interchange between different modes and reduce barriers to use.

To ensure delivery of interventions aligns with our Transport Strategy vision of net zero carbon by 2050 at the latest, with an aim to achieve it by 2040, consideration needs to be given to:

1. The condition of and signage for existing walking, wheeling, and cycling routes (including public rights of way and bridle paths) to be assessed to ensure greater possible levels of accessibility and network understanding by existing and prospective users;
2. Identification and addressing of ‘weak links’ in existing and proposed active travel routes such as segregated paths ending abruptly; and
3. Development of end-to-end delivery strategies in partnership with the private sector to reduce impact of freight movements on the community (smaller towns and villages in particular) through new infrastructure such as rail freight interchanges.

Package 4 Summary Map



Package 5: Creating an Integrated Transport Network

The focus of this fifth package is on ***better integrating modes and reducing their overall cost and impact on the environment to encourage multi-modal journeys that more sustainably meet individual travel needs***.

Interventions included in this package support all of the previous packages 'global' interventions that apply across the study area. They benefit all potential users through improvements such as expansion of electric and hydrogen vehicle charging networks and improvements in the way services connect and information about them communicated in advance and at places like bus stops.

The shift to zero emissions vehicles (in the overall energy cycle and not just local tailpipe emissions) will fundamentally change the emissions profile of the transport network. It is therefore even more important to 'get the basics right' in making the case for and improve the attractiveness and perceived reliability of alternatives to less efficient car journeys.

Benefits of this package are expected to include:

- **Supporting a shift away from emissions intensive vehicles** through a wide ranging and reliable network of charging stations for electric vehicles and potentially alternative zero emissions fuels such as hydrogen;
- **Reduced car dependency and congestion** by making public transport be and feel more reliable and predictable through provision of real time journey planning information, integrated ticketing and better alignment between different services and modes (for example at mobility hubs); and
- **Assistance with cost-of-living pressures** through improved access to more affordable travel options for more people and further reducing the cost of accessing such services through increased public operational investments to reduce operator reliance on fare revenue.

Key links to other packages include:

- **Development of HERT will provide a step change in connectivity** (Packages 2 and 3) that will depend on and further build the case for better integrated timetables and ticketing between different services;
- **Improved east-west bus connectivity in the north** (Package 1) will similarly build the case and need for improved integration of rail and bus timetables and the need for users to have a more seamless experience through more integrated ticketing; and
- **Improved freight and rural connectivity** (Package 4) will depend on the expansion charging infrastructure for electric and alternative fuels vehicles as the overall vehicle fleet is decarbonized.

To ensure delivery of interventions aligns with our Transport Strategy vision of net zero carbon by 2050 at the latest, consideration needs to be given to:

1. Balancing direct investment by the public sector with the ability to unlock and leverage private sector capital to deliver initiatives such as consistent and reliable electric vehicle charging;
2. Reframing of 'subsidy' when referring to public transport services in order to better align it with how operational investment in road infrastructure is currently discussed, improving public and political understanding of the relative benefits of different modes of travel in a more holistic way; and
3. Passing on operational efficiencies to transport network users through lower fares and operating charges wherever possible.

Note: No summary map is provided for this package as the interventions do not have specific geographies within the study area.

Impact Assessment

EEH commissioned Steer to develop a model to test the impact of the packages developed within the connectivity studies on transport and socioeconomic outcomes up to the year 2049. This model, known as the England's Economic Heartland Economy and Land Use Model (EEHELUM) and updated in 2023, is a transport and land use model that simulates the interaction of transport, people, employers and land use over periods of time.

To model each package in EEHELUM, adjustments were primarily made to the generalised journey times (GJTs) within and between each zone (by mode) to reflect the anticipated impact users will get from the proposed interventions identified. The packages were modelled in EEHELUM and presented in comparison to a business-as-usual scenario (BAU) based on the national trip end model (NTEM) which also projects employment and population growth to 2049.

Investment and Expenditure

The construction and maintenance cost estimates have also been prepared to a level of detail commensurate with the maturity of the design of the interventions and the current level of detail available on the proposals. Items have been priced using either published costs, estimated based on similar known schemes or built up based upon industry standard rates. All estimates have a base year of 2022.

To reflect the lack of maturity of the design, risk allowances have been applied to the higher range costs at levels commensurate with SOC estimates, informed by DfT's transport analysis guidance (TAG) as detailed in the table below. Operations cost estimates have been presented as low, medium and high range of costs. This reflects a level of uncertainty in cost estimating accuracy, due to the lack of maturity of the design and available detail for many schemes. The low costs are based on estimated delivery costs in 2022, medium applies a +10/+15% increase and high accounts for additional risk and optimism bias.

Connectivity Plan Benefits

Table 1 summarises the key modelled impacts of each package and overall for all 83 interventions included in the recommended connectivity plan compared to a BAU scenario for 2049. It also includes the medium estimate of investment in construction and maintenance, as well as an indication of relative operational investment requirements.

Though a Benefit Cost Ratio (BCR) and Value for Money assessment is not appropriate at this stage in the business case development process, **overall economic benefits are expected** (in terms of GVA per annum and emissions reduction) against the required investment to deliver and operate each intervention.

Demand Management

Demand management measures, such as behaviour change initiatives and price signals to make more efficient use of limited road space and increase the relative appeal of more sustainable modes, were not included in the recommended connectivity plan beyond schemes already being considered by local authorities in the EEH region.

Through the development of this study, the impact of further demand management interventions was considered. This highlighted the benefits that demand management could bring to encouraging additional mode shift to public transport, walking, wheeling, and cycling, provided it was at the right scale. It can also assist in further reducing carbon emissions and improving quality of life, the public realm, and air quality. While not considered in this assessment, funding generated by interventions such as the Workplace Parking Levies can also be utilised to fund other transport improvements, particularly where funding sources are constrained.

Demand management solutions should be considered either nationally, within the geography of individual local authority areas, or both. A region-wide demand management solution is not currently as aspiration of the EEH Board.

Table 1: Modelled Impacts and Estimated Investment

	Change in Daily Return Trips (Journeys to/from and within study area in comparison to BAU 2049)				Change in Socioeconomic Indicators (In comparison to BAU 2049)				Investment and Expenditure (Mid Cost - £ million 2022 prices)		
	Private vehicles*	Rail	Bus	Active	Population	Jobs	GVA (£ million per annum)	Carbon ($KTCO_2e$ per annum)	Construction	Maintenance & Renewal	Operations
Business as Usual (BAU) 2049	*3,400,000*	*150,000*	*220,000*	*880,000*	*1,840,000*	*740,000*	*90,000*	*665*			
Package 1: Aylesbury – Luton – Stevenage	-20,000	-	20,000	30,000	600	700	100	-2	720	50	Medium
Package 2: Amersham – Watford – St Albans	-5,000	-	5,000	15,000	200	1,100	100	-1	760	40	High
Package 3: Hemel Hempstead – St Albans – Stansted	-15,000	-	10,000	15,000	300	1,200	200	-2	1,710	120	High
Package 4: Sustainable Rural and Freight Connectivity	-5,000	-	5,000	5,000	100	500	100	-1	900	50	Low
Package 5: Creating an Integrated Transport Network	-35,000	5,000	5,000	20,000	200	300	100	-17	250	20	Low
Combined Impact	**-80,000**	**5,000**	**45,000**	**85,000**	**1,400**	**3,800**	**600**	**-22**	**£4,340**	**£280**	
% Change vs BAU 2049	**-2%**	**3%**	**20%**	**10%**	**0%**	**1%**	**1%**	**-3%**			

Next Steps

All of the interventions recommended in this study will be included as new entries into EEH's dynamic Investment Prioritisation Framework or used to update existing entries such as those from previous studies. Appendix A includes some of the key 'intervention information' that will be transferred across to the Framework tool for ongoing consideration by EEH and its partners. Further details will also be drawn from the Evidence Base and Full Technical Reports that form part of this study.

Using the Framework, EEH will work with partners to update and utilise the Investment Prioritisation Framework. These groups include:

- The **Transport Officer Group (TOG)** which is composed of Head of Service or Senior Officer level representation from partner authorities and provides technical oversight of EEH general governance;
- The **Strategic Transport Leadership Board** composed of local authority leaders (or their nominated cabinet member substitute) and senior supporting officers which provides decision making on key EEH actions and/or final outputs including the approval and publishing of reports, strategies and studies; and
- Members of the **Steering and Stakeholder Groups** established as part of this and other connectivity studies where they are not part of the above.

Local Authorities will be able to draw from this study and the Investment Prioritisation Framework to build their own investment pipelines and strategies to highlight those interventions that are supported and provide strategic benefits, not only the Local Authority, but across the Heartland region.

Funding and financing

It is recognised that funding is challenging nationally. This includes for large capital schemes, but also revenue funding for interventions and programmes for behaviour change and service operating subsidies, as well as early stage scheme and business case development.

A range of funding models will need to be analysed and considered and there are several funding sources able to support infrastructure investment in the EEH region which may vary in the likely amount of funding they will generate, and the challenges associated with their implementation. Additionally, new funding sources may emerge in response to environmental, economic, and social changes over the life of EEH's Transport Strategy.

Potential funding sources are not limited to but may include:

- **Central Government funding:**, e.g. Transforming Cities, Towns, Levelling Up or Shared Prosperity Funds, Bus Service Improvement Plan funding, Housing Infrastructure Fund, Rail Network Enhancements Pipeline;
- **National Roads Fund:** e.g. Roads Investment Strategy, Major Road Network;
- **Third party contributions:** e.g. from major private sector investors, land/asset owners, and developer contributions (including S106 agreements and Community Infrastructure Levy); and
- **Local rates/levies:** e.g. Business Rate Supplement, Council Tax, parking charges, and Integrated Transport Block funding.

While possible funding sources are also noted, specific options for funding are only included in the Framework as an intervention and its details are further progressed in the business case development and approvals processes.

Delivery Plan

The current assumptions, in order to identify indicative durations for the different types of interventions, comprising the different packages, are presented below.

Planning timescales have been considered as well as the scale and complexity of the scheme, its current stage (e.g., pre SOC, SOC, OBC etc) and what powers and consents are required, along with major considerations such as securing funding and land assemblage.

The total implementation time assumptions for each of these range from 0 - 2 years for an active travel intervention to 15 - 20 years for a new offline rail infrastructure scheme.

The assumed scheme promoters and the corresponding funding source were as follows, but noting that there is an important role for the private sector, partnerships, and innovative funding and financing tools:

- Rail network – Network Rail (Great British Railways) and Transport Operating Companies (TOCs)
- Mass rapid transit – local transport authorities
- Active travel – local transport authorities
- Strategic Road Network – National Highways
- Major Road Network – local transport authorities

The full list of interventions in Appendix A provides an overview of what could be delivered based on the indicative timeframes for each intervention:

- **Short term** schemes were judged to have a construction start date between 2025 and 2032 with benefits beginning to be accrued within this timescale.
- **Medium term** schemes were judged to have a construction start date between 2033 and 2040.
- **Long term** schemes were judged to have a construction start date 2041 onwards.

Consideration of risks

EEH will seek to assist in the apportion or sharing of the different responsibilities and risks between parties, with both being allocated to the party best placed to manage them based on the needs of each project. The delivery of any intervention(s) included in the Investment Prioritisation Framework and each element of them should be set out in a way that:

- Allocates risk appropriately across contracts;
- Incentivises the intended outcomes in terms of performance, efficiency, and innovation;
- Facilitates the delivery of the project to time and budget; and
- Secures the targeted economic, social, and environmental benefits of the project as discussed with stakeholders and agreed with decision makers.

Role for EEH based on each intervention

As EEH does not have statutory powers to deliver schemes directly, its role in helping to prioritise, advocate for and or help to coordinate stakeholders to deliver will vary with each of the interventions recommended.

This will also be shaped by a range of other factors, such as availability of resources within local authorities and infrastructure owners, Requirements set by Government in providing funding, and the need or not for cross-boundary coordination.

Local strategy alignment

Both connectivity studies and Framework provide a strategic narrative and evidence for Local Authorities in the development of their work. For example, the Department for Transport is expected to release new guidance on the development of Local Transport Plans (LTPs), which consider the future shape of local transport. The outputs of this study can inform the strategic narrative and development of any new or updated LTPs, with the studies highlighting interventions that are regionally supported and provide strategic benefits, not only the Local Authority, but across the Heartland region.

Appendix A: Full List of Interventions

The following is a full list of interventions that form part of the recommended connectivity plan for the Southern East West Movements study area with the primary package allocations **(in bold)** and those they are closely related to, as well as an indicative timeframe for delivery.

Based on stakeholder input from the Infrastructure Scenario development, intervention phasing was considered based on three key time periods:

- **Short term** schemes were judged to have a construction start date between 2025 and 2032 with benefits beginning to be accrued within this timescale.
- **Medium term** schemes were judged to have a construction start date between 2033 and 2040.
- **Long term** schemes were judged to have a construction start date from 2041 onwards.

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000607A	**A1(M) Junction 8 Capacity Improvements to improve public transport movements**	*A1m Junction 8 - Signalisation of Stevenage Rd and Graveley Rd approaches. Left turn slips to be added from Hitchin Rd to southbound A1(M) ON slip. Timings to discourage rat runs on minor roads and incorporate bus priority - cycle / ped provision across junction also needs improved.*	**1,** 4	Medium term
EEH000608A	**A1(M) Junction 9 Capacity Improvements to improve public transport movements**	*Signalisation of the A1(M) Junction 9 grade separated roundabout. Further scheme development to pay particular attention to ways to support bus movements and limit inducing additional demand from private vehicles.*	**1,** 4	Medium term
EEH000639A	**A414 Corridor Capacity Improvements for HERT**	*Junction improvements along the A414 corridor to facilitate HERT services and passenger transport priority improvements in urban areas - these are initial bus priority improvements in urban areas (including St Albans and Hertford) - initially to support buses (through the BSIP programme) which could later be used to facilitate the HERT system. Introduction of new traffic Lanes by removal of Islands for extra carriageway space. Alignment with the proposed HERT connection, the HERT is planned to connect Hemel Hempstead, Watford, St. Albans, Hatfield,*	**3,** 2, 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
		Welwyn Garden City, Hertford, Ware, Gilston Villages and Harlow. Intervention includes A414 junction improvements around A1(M) Junction 4.		
EEH000669A	**A5183 / B487 HGV Restrictions**	*HGV restrictions on the A5183 / B487 to encourage HGVs to use other strategic routes, for example, M1 as the alternative strategic route.*	**4,** 2, 3	Medium term
EEH000622A	**Abbey Line Capacity Enhancements (HERT Link)**	*Enhance passenger transport service frequency and incorporate the route as part of the HERT system.*	**2,** 3, 4	Medium term
EEH000638A	**Active travel improvements associated with A10 junction improvement schemes**	*Complementary active travel improvements to the A10 junction improvement schemes to enhance cycle and pedestrian routes along Church Lane, College Road and parallel to the A10 (part of the A10 MRN package).*	**3,** 2, 4	Short term
EEH000638A	**Aylesbury to Tring cycle link - Arla Dairies - Tring**	*Aylesbury to Tring cycle link - cycle link opportunity identified in the EEH Active Travel Strategy. This has been delivered along the Canal to Arla Dairies only, so missing link between here and Tring.*	**4,** 1	Short term
EEH000640A	**Broxbourne MRN - (A10 / College Road Capacity Improvements / Lieutenant Ellis Way Capacity)**	*A10 / College Road at grade junction improvements providing a new southbound left filter lane into College Road from the A10 north and improved facilities for active travel. A10 /Church Lane - at grade junction improvements providing improved facilities for active travel and retiming of signals enabled by banning right turn movements onto the A10. Reconfiguration of the A10 / Lieutenant Ellis Way junction into a hamburger style junction with access into (and out of) the Park Plaza West site at the Great Cambridge Road / Great Eastern Road signals. Further scheme development to pay particular attention to ways to support bus movements and limit inducing additional demand from private vehicles.*	**3,** 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000609A	**Bus Rapid Transit level services between Luton and Stevenage**	*An initial investigation of the need and scope for junction improvements which would provide bus priority and potentially allow for Bus Rapid Transit services on an east-west corridor between Luton and Stevenage. Junction locations to be investigated in Luton such as New Bedford Road, Leagrave Road / Lewsey Road, Chaul End Lane, New Bedford Road/Telford Way, Church Street, Vauxhall Way/Crawley Green Road, Hitchin Road/Crescent Road throughout Luton. Also, junctions in Hitchin on the A505 /A602 corridor. (i.e. A505/Pirton Road, A505/Paynes Park and A602/Hitchin Hill).*	**1**	Medium term
EEH000675A	**Community Transport Optimisation**	*Focus on ways to maximise the efficiency of these community transport operators as 'family' of services, avoiding duplication of journeys and maximising connectivity to bus/mobility hubs and rail stations. It also explores the role of CT operations and fleet in serving new development ahead of conventional services to capture customers at the outset. The workstream examines the role of CT in enabling access to key services by younger people, and also provides accessibility for new developments catering for elderly users and others with access needs.*	**5,** 1, 2, 3, 4	Medium term
EEH000676A	**Creation and Updating of Enhanced Partnerships or Franchising Arrangements**	*Local Transport Authorities (LTAs) to establish Enhanced Partnerships or Franchising Arrangements. An enhanced partnership is a statutory partnership between one or more LTAs and their local bus operators that sets out how they will work together to deliver Bus Service Improvement Plan outcomes in the defined geographical area. Local Authorities with Bus Service Improvement plans include Hertfordshire County Council, Buckinghamshire Council, Milton Keynes Borough Council, Oxfordshire County Council (Bicester), North Northamptonshire, West Northamptonshire, Luton and Central Bedfordshire.*	**5,** 1, 2, 3, 4	Short term
EEH000677A	**Developing Local Logistic Partnerships to help better manage road and rail freight**	*Setting up partnership arrangements working with SME and large logistics operators to work together in the areas of freight travel planning, carbon reduction, 'last mile' delivery and collaborating on ways to reduce freight carbon miles strategically and locally. Also, to provide a mechanism to address local issues on routing, delivery patterns and 'neighbour' impact of freight transport. EEH is setting up a Freight Officer Group, which will help bring together partners and*	**5,** 1, 2, 3, 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
		industry to better co-ordinate freight movements. Work in partnership with National Highways and Network Rail.		
EEH000678A	**Digital Frameworks for Improving Coordination and Delivery of Freight**	*This intervention is the creation of digital frameworks for how and where freight is moved. In is anticipated that these would be developed through cross working between local government and the freight haulage sector. EEH is setting up a Freight Officer Group, which will help bring together partners and industry to better co-ordinate freight movements.*	**5,** 1, 2, 3, 4	Short term
EEH000679A	**Electric Charging Upgrades at Mobility Hubs**	*New Electrical Vehicle (Ev) charging hubs / superhubs at existing park and rides sites / mobility hubs.*	**5,** 1, 2, 3, 4	Medium term
EEH000662A	**Enhanced bus services between Aylesbury, Dunstable and Luton**	*Service 61 to Dunstable (via Tring) exists, but only goes on to Luton once a day – This option seeks to enhance bus service frequency between Aylesbury, Dunstable and Luton. An assessment of demand/pilot is a proposed first step.*	**1**	Short term
EEH000680A	**Enhanced First Mile / Last Mile Sustainable Freight Delivery**	*This intervention is the creation of freight consolidation centres on the outskirts of towns / cities with first mile / last mile sustainable freight delivery. Watford is a notable location where this intervention is potentially being considered. EEH is setting up a Freight Officer Group, which will help bring together partners and industry to better co-ordinate freight movements.*	**5,** 1, 2, 3, 4	Medium term
EEH000665A	**Expansion of Demand Responsive Transport (DRT) Schemes (including maintaining funding for existing schemes)**	*Expansion of DRT services, including Herts Lynx service to other areas of Hertfordshire building on services in East Herts and Dacorum, Milton Keynes DRT Service to surrounding rural areas, Buckinghamshire services to and around Aylesbury and High Wycombe, and services in the Northamptonshire service area.*	**4,** 1, 2, 3	Medium term
EEH000666A	**Expansion of Rural Car Clubs**	*Creation of car clubs in rural areas. This will reduce the need for ownership of a private car / multiple private cars.*	**4,** 1, 2, 3	Short term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000667A	**Expansion of Rural Ride Sharing**	*Creation or supporting the expansion of a digital platform(s) to make it easier for people living in rural areas to share journeys by private car.*	**4,** 1, 2, 3	Medium term
EEH000681A	**Expansion of the Electric Vehicle Charge Point Network**	*Electricity and other infrastructure upgrades to deliver significant increase in the electric charging capacity (rapid charging hubs, for example) available to all vehicle types using the strategic and major road networks through the region, with a particular focus on supporting increased uptake of electric HGVs, greater sharing of best practice and EV locations (via zap-map.com) to reduce emissions and air pollution from freight. Historic England has noted that for some specific interventions to achieve this a high-level assessment may be needed as part of later project stages to understand potential heritage impacts.*	**5,** 1, 2, 3, 4	Medium term
EEH000682A	**Expansion of the Hydrogen Vehicle Charge Point Network**	*Fuel supply, storage and other infrastructure upgrades to deliver significant increase in the hydrogen charging capacity available to all vehicle types using the strategic and major road networks through the region, with a particular focus on supporting increased uptake of electric HGVs to reduce emissions and air pollution from freight. Historic England has noted that for some specific interventions to achieve this a high-level assessment may be needed as part of later project stages to understand potential heritage impacts.*	**5,** 1, 2, 3, 4	Medium term
EEH000683A	**Freight/Goods Delivery Management Plans and Freight Quality Partnership**	*Share knowledge with freight haulage on delivery management plans and put in best practice. EEH is setting up a Freight Officer Group, which will help bring together partners and industry to better co-ordinate freight movements.*	**5,** 1, 2, 3, 4	Short term
EEH000643A	**Harlow Eastern / Central Stort Crossings**	*Central Stort Crossing - Widening of Eastwick Crossing in Harlow and implementation of a north south sustainable transport corridor with bus priority and cycling infrastructure to Harlow Town Centre (from Eastwick Roundabout to Burnt Mill roundabout). Eastern Stort Crossing – New Eastern crossing across the River Sturt connecting the A414 and River Way with new link to*	**3,** 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
		Eastwick Road and Pye Corner. Further scheme development to pay particular attention to ways to support bus movements and limit inducing additional demand from private vehicles.		
EEH000644A	**Hemel Hempstead Bus priority schemes**	*Bus priority schemes on key movement corridors within Hemel Hempstead including the A414 and A4251 corridors (which could also be used by the future HERT system).*	**3,** 2	Medium term
EEH000645A	**Hertfordshire Essex Rapid Transit (HERT) on A414 Corridor**	*Initial delivery of HERT. Proposed Trackless Tram providing a new East West Passenger Transport Service from Hemel Hempstead to Harlow with onward connections to Stansted Airport. The HERT system will include key interchanges with the north south railway lines and potentially associated park and ride sites to maximise wider connectivity. Proposed route is Hemel Hempstead – Gilston: This is the main east-west section that will serve the main settlements between Hemel Hempstead and the new Gilston Area development, which forms a part of the Harlow and Gilston Garden Town. It will also improve connections to London Luton Airport via interchange in St Albans. St Albans – Watford: This north-south section will operate between St Albans and Watford. This corridor is currently served by the Abbey Line with potential for onward connections to west Watford. Gilston Area– Harlow (and onward connections to Stansted Airport): This section will provide links from the Gilston Area and Harlow, providing improved onward connections to Stansted Airport.*	**3,** 2, 4	Long term
EEH000611A	**High frequency bus services between Leighton Buzzard, Luton, and Stevenage**	*Bus Rapid Transit (BRT) level service making use of existing and or expanded extended busways as well as bus priority measures on key roads such as the A505 and A602. Connections would be provided to Main Line rail services at Leighton Buzzard, Luton, and Stevenage Railway Stations. System to explore low carbon options e.g. fully electric or hydrogen buses where possible as a preference, with mixture of local and limited stop express services. Intervention has the option to improve and or extend bus connections with Stanstead Airport. The service improvements should be developed with due consideration of other bus services in the region such as those serving Aylesbury and rural areas of Buckinghamshire.*	**1**	Long term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000612A	**Hitchin Railway Station Access Improvements**	*New eastern access at Hitchin Railway Station to improve pedestrian, cycle and public transport accessibility. Historic England have noted that the station lies within the Ransom's Recreation Ground Conservation Area which will need to be further considered in later project stages.*	**1**	Short term
EEH000613A	**Improve bus connectivity and active travel links between Hitchin, Letchworth Garden City and Baldock (including Hitchin BSIP)**	*The main scheme priorities for the corridor are improved walking and cycling links between the towns of Hitchin, Letchworth Garden City and Baldock, and improved interurban bus connectivity between towns in the corridor. Historic England have noted need to look for opportunities to enhance access to heritage assets, especially those which are designated, without harming their significance (including their setting).*	**1**	Short term
EEH000684A	**Improved Connectivity Between Rail and Bus Services**	*Increased attractiveness and use of public transport journeys using multiple modes through improved integration of bus and rail timetables, improved connections between bus routes and station, and integrated ticketing between modes. Provide information sharing on routes and journey options.*	**5,** 1, 2, 3, 4	Medium term
EEH000685A	**Improved Digital Connectivity in Urban and Rural Areas**	Reduce demand for travel from those making journeys due to poor or unreliable digital connectivity and improve connection reliability for public transport users, with schemes including continued rollout of 5G technology.	**5,** 1, 2, 3, 4	Medium term
EEH000668A	**Improved HGV Parking and Welfare Facilities**	*Enhanced HGV parking and welfare facilities within 5km of the A45, A43, A5 and M1 (including Junction 9). The intervention is a regional consideration and HGV parking opportunities may be private sector led.*	**4,** 1, 2, 3	Medium term
EEH000679A	**Improved Wayfinding Information for all modes**	*Improved wayfinding information in urban areas and along inter-urban active travel routes. Historic England have noted need to look for opportunities to enhance access to heritage assets, especially those which are designated, without harming their significance (including their setting).*	**5,** 1, 2, 3, 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000642A	**Improvement of the A414 / A1081 London Colney Roundabout**	*Improvement of the A414 / A1081 London Colney Roundabout to provide new active travel crossings whilst ensuring reliable vehicle journey times through it. Any changes need to take into account potential HERT routeing in the area.*	**3,** 2, 4	Medium term
EEH000646A	**Improvements to highways in Hertford to support higher frequency bus services and facilitate HERT**	*Additional highway or other measures needed to facilitate enhancements to the HERT. In the event that on-line interventions prove insufficient to enable prioritised passenger transport delivery alongside reasonable accommodation of traffic on this strategic route, consideration may be given to the provision of a highway realignment north or south of Hertford to reroute the A414 and connect with the A10 east of the town. The scheme would deliver significant improvements in walking, cycling and passenger transport provision through reduced traffic. This would be in alignment with both the emerging LCWIP, in terms of promoting additional walking and cycling opportunities, and the proposals for HERT set out in EEH000645. A previous study found a further option of introducing the mass rapid transit services without the delivery of a southern realignment should be modelled and considered before any decision is taken on the proceedings with a realignment scheme. Historic England has noted that a high-level sensitivity assessment would be needed to understand potential heritage impacts.*	**3,** 2, 4	Medium term
EEH000647A	**LCWIP interventions in Broxbourne (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Broxbourne. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. Building on the new active travel links being developed such as the New River Path, cycle connections on Waltham Cross and the A10 MRN improvements.*	**3,** 4	Short term
EEH000648A	**LCWIP interventions in Dacorum (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Dacorum. The LCWIP will improve links between Tring and Aylesbury and Berkhamsted and Chesham as identified in the EEH Active Travel Strategy. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is under development.*	**3,** 2, 4	Short term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000649A	**LCWIP interventions in East Hertfordshire (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in East Hertfordshire. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is under development.*	**3,** 4	Short term
EEH000650A	**LCWIP interventions in Hertsmere (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Hertsmere. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is now under development.*	**3,** 2, 4	Short term
EEH000568A	**LCWIP interventions in High Wycombe (a programme of prioritised schemes will be taken forward) as identified Thames Valley – Northamptonshire Study 4**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in High Wycombe. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is now complete.*	**3,** 4, 5	Short term
EEH000624A	**LCWIP interventions in North Hertfordshire (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in North Hertfordshire. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is adopted.*	**1,** 4	Short term
EEH000623A	**LCWIP Interventions in St Albans (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in St Albans. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP is now adopted.*	**2,** 3, 4	Short term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000615A	**LCWIP interventions in Stevenage (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Stevenage. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP has been adopted.*	**1**	Short term
EEH000624A	**LCWIP interventions in Three Rivers (under development)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Three Rivers. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. LCWIP is currently being finalised following consultation.*	**2,** 3, 4	Short term
EEH000625A	**LCWIP interventions in Watford (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Watford. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP has been adopted. Proposed cycling improvements have been identified for Watford Green Loop (East), Whippendell Road, St. Albans Road, Watford to Carpenders Park Route and Hempstead Road. Proposed walking improvements have been identified in the Town centre to Bushey Station, and along Vicarage Road, Rickmansworth Road, Whippendell Road, Watford Junction Access, Rosslyn Road and Albert Road south.*	**2,** 3, 4	Short term
EEH000651A	**LCWIP interventions in Welwyn and Hatfield (a programme of prioritised schemes will be taken forward)**	*The delivery of a LCWIP and active travel infrastructure and connectivity improvement schemes in Welwyn and Hatfield. The purpose of this plan is to identify and prioritise key active travel routes for improvement, including relevant supporting traffic management measures. The LCWIP has been adopted.*	**3,** 4	Short term
EEH000616A	**London Luton Airport Sustainable Transport Access Improvements**	*Improve passenger access and transport choice to support airport operations and future growth. This includes a new access road to support bus and private vehicle movements which will extend from New Airport Way round the edge of the airport to the business area, linking the A1081 to New Century Park. Investment to be met by Network Rail for improved rail access to the Airport.*	**1,** 4	Long term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
		Century Park Access Road Scheme in Luton: online dualling of President Way, together with other roads to serve the Green Horizon Parks site. Enhanced bus and cycle connections to the Airport including interchange with DART.		
EEH000617A	**Luton Town Centre Bus Lane Scheme**	*A range of bus priority infrastructure schemes in Luton Town Centre to improve bus journey reliability, experience and journey times. Proposed additional priority measures to build on the existing bus lane in one direction on the A505 from Chaul End Lane to the M1. Later stages to consider conservation areas in central area and ensure they are protected or enhanced.*	**1**	Medium term
EEH000618A	**Luton-Dunstable Busway Extension to Leighton Buzzard**	*Possible extension of the Luton-Dunstable Busway services to Leighton Buzzard, 5.8 miles (9.3 km) west of Houghton Regis. This extension could create a direct rapid transit link from Leighton Buzzard railway station on the West Coast Main Line to London Luton Airport. Options could include using existing highway networks or using the previous Dunstable Branch Line Alignment. To note associated bus services in intervention EEH000611A, High frequency bus Services between Leighton Buzzard, Luton, and Stevenage.*	**1**	Medium term
EEH000669A	**M1 Junction 8 Capacity Improvements**	*Major reconfiguration of M1 Junction 8 to provide direct access into Maylands. Further scheme development to pay particular attention to ways to support bus movements and limit inducing additional demand from private vehicles. This would form part of Project Breakspear which also includes a high quality ped and cycle bridge over the A414 west of the motorway and an upgrade to the A414 / Green Lanes junction.*	**4,** 2, 3	Medium term
EEH000652A	**M1 Junction 4 reconfiguration**	*Additional 'missing' slip roads on the M1 at Junction 4 (Elstree Hill) to improve access to the M1 and reduce M1 south traffic within Watford City Centre'.*	**3,** 4	Medium term
EEH000626A	**M25 Junction 20 Capacity Improvements**	*Junction capacity improvements at M25 Junction 20 to address existing congestion issues and support future growth. Further scheme development to pay particular attention to ways to support bus movements and limit inducing additional demand from private vehicles.*	**2,** 3, 4	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000619A	**New BRT System between London Luton Airport and Stevenage Railway Station (possibly along the A505)**	*New BRT system between London Luton Airport and Stevenage Railway Station (possibly along the A505).*	**1**	Long term
EEH000627A	**Investigating New Strategic Mobility Hub at M1 Junction 5 (Park & Ride)**	*Investigation of Park and Ride near to M1 Junction 5 to capture longer distance trips into Watford.*	**2,** 3, 4	Medium term
EEH000628A	**New Strategic Mobility Hub at M25 Junction 20 (Park & Ride)**	*Investigation of Park and Ride near to M25 Junction 20 with enhanced bus services from Kings Langley into Watford.*	**2,** 4	Medium term
EEH000653A	**New Strategic Mobility Hub serving Hemel Hempstead (potential to link to HERT system)**	*New multi-modal transport interchange at A414 Junction 8 serving Maylands Business Area, an additional hub serving Hemel Hempstead town centre, both of these could be key stops on the future HERT system.*	**3,** 2, 4	Medium term
EEH000672A	**Nickey Line Active Travel Corridor**	*Improvements to the Nickey Line active travel route connecting Harpenden and Hemel Hempstead along the disused railway line including step free access points, surfacing improvements and extending the route to Hemel Hempstead town centre and Railway station.*	**4,** 3	Medium term
EEH000620A	**North / South Stevenage Bus Corridor**	*Feasibility into potential bus corridor running North / South through Stevenage to connect new developments to Lister Hospital as well as the Gunnelswood employment area to the GSK campus with high quality bus priority.*	**1**	Short term
EEH000630A	**Railway Station Access and Accessibility Improvements at Amersham (including mobility hub elements)**	*Improved access to existing and additional rail services at Amersham Railway Station with schemes including step-free access to all platforms, and transport hubs elements including improved cycle parking quality and quantity, improved and expanded local bus services to facilitate onward journeys into London, and enhanced EV charging provision for any parking.*	**2,** 3	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000631A	**Railway Station Access and Accessibility Improvements at Croxley**	*Improved access to existing and additional rail services at Croxley Railway Station with improved links to the Watford to Croxley Link. Including improvements that provide step-free access to all platforms, and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking. Croxley will provide the terminus to the Watford to Croxley Link which will form part of the overall HERT system.*	**2,** 3	Medium term
EEH000654A	**Railway Station Access and Accessibility Improvements at Hatfield**	*Improved access to existing and additional rail services for existing Hatfield station on East Coast Main Line with schemes including improvements that provide step-free access to all platforms. Historic England have noted an historic impact assessment is needed to improve access to and the setting of Hatfield House RPG (GI) and Old Hatfield conservation area.*	**3**	Medium term
EEH000655A	**Railway Station Access and Accessibility Improvements at Hertford East**	*Improved access to Hertford East station - including new crossing facilities and urban realm works to improve the environment outside the station, alongside improved taxi facilities, cycle parking and EV charging provision.*	**3**	Medium term
EEH000656A	**Railway Station Access and Accessibility Improvements at Hertford North**	*Improved access to existing and additional rail services for existing Hertford North station on Hertford Loop Line with schemes including improvements that provide step-free access to all platforms, and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking.*	**3**	Medium term
EEH000632A	**Railway Station Access and Accessibility Improvements at Rickmansworth**	*Improved access to existing and additional rail services at Rickmansworth Railway Station with schemes including improvements that provide step-free access to all platforms, and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking.*	**2,** 3	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000657A	**Railway Station Access and Accessibility Improvements at Rye House**	*Improved access to existing and additional rail services for existing Rye House Station on Hertford East branch Line with schemes including improvements that provide step-free access to all platforms, and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking. Historic England have noted an historic impact assessment is needed to improve access to and the setting of Rye House Gatehouse (GI) / Rye House Scheduled Monument.*	**3**	Medium term
EEH000658A	**Railway Station Access and Accessibility Improvements at St Albans City**	*Improved access to existing and additional rail services for existing St Albans City station on Midland Main Line with schemes including improvements that provide step-free access to all platforms, improved cycle and walk connections to the station including the development of a high quality sustainable transport route to the town centre along Victoria St. and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking. Historic England have noted that the station lies within the St Albans Conservation Area which will need to be further considered in later project stages.*	**3,** 2	Medium term
EEH000621A	**Railway Station Access and Accessibility Improvements at Stevenage**	*Improved access to existing and additional rail services for existing Stevenage station on East Coast Main Line with schemes including improving access to all platforms, including further reconfiguration of area in front of the station to enhance connections with the bus station and town centre.*	**1**	Medium term
EEH000659A	**Railway Station Access and Accessibility Improvements at Ware**	*Improved access to existing and additional rail services for existing Ware Station on Hertford East branch Line with schemes including improvements that provide step-free access to the existing platform, and transport hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking. Historic England have noted that the station lies within the Ware Conservation Area which will need to be further considered in later project stages.*	**3**	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000633A	**Railway Station Access and Accessibility Improvements at Watford High Street**	*Improved access to additional rail services at Watford High Street Railway station including step free access to all platforms. Station to become part of High Street mobility hub with improved links to new bus station and Watford to Croxley Link as well as public realm and active travel improvements.*	**2,** 3	Medium term
EEH000634A	**Railway Station Access and Accessibility Improvements at Watford Junction**	*To reduce peak time passenger crowding and support growth forecast in CP6 and beyond through improved interchange and access to rail services at Watford Railway Station (including future services made possible by HS2 through the release of capacity on existing rail routes). Possible improvements including a new mobility Hub to the east of the station connecting to new pedestrian bridge connecting Abbey Line platform 11 to other platforms and the bus forecourt, other improvements that provide step-free access to all platforms, transport hubs elements including improved cycle parking quality and quantity, improved physical and operational integration with local bus services, and expanded electric vehicle charging.*	**2,** 3	Medium term
EEH000660A	**Railway Station Access and Accessibility Improvements at Welwyn Garden City**	*Improve access to existing and additional rail services for existing Welwyn Garden City station on East Coast Main Line, where possible, this could include improved cycle parking quality and quantity, better walking and cycling routes to the station, improved integration with local bus services. Historic England have noted that the station lies within the Welwyn Garden City Conservation Area which will need to be further considered in later project stages.*	**3**	Medium term
EEH000687A	**Real Time Passenger Information Online and at Stations and Bus Stops**	*Working with operators and authorities, EEH will ensure that examples of best practice are identified, and lessons learned applied across the area, including improved online accessible information provision.*	**5,** 1, 2, 3, 4	Short term
EEH000661A	**Reconfiguration of Bus Services in Hemel Hempstead**	*Reconfiguration of bus services in Hemel Hempstead to take into account future growth aspirations. This should include improved connectivity to Maylands, Hemel Hempstead railway station, Hemel Hempstead town centre and improved east-west links to neighbouring towns. This*	**3,** 2	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
		also includes bus priority measures on approaches to Plough roundabout (A414 WB, Station Road and Two Waters Road).		
EEH000688A	**Reduced Public Transport Fares**	*Reduction in the cost to use public transport across the region and or for specific users on targeted routes. Could include continuation of £2 fare caps, subsidising / pump priming bus services near expanding employment centres, and other measures to encourage travel by public transport.*	**5,** 1, 2, 3, 4	Short term
CS5000001A	**Road Safety/Capacity improvements near Aylesbury**	*Plan and develop road safety / capacity improvement schemes near Aylesbury, noting that this issue and associated schemes are included in the previously developed Oxford-Milton Keynes study (particularly relevant are the following schemes: A418 Aylesbury Northern and Southern Ring Roads, A41 Waddeston Placemaking, A418 Dinton, Stone, Upton, Hartwell Placemaking, , A418 Rowsham Placemaking and A418 Wing Placemaking).*	**4,** 5	Medium term
EEH000673A	**Rural Digital Innovation Hubs**	*The creation of rural digital innovation hubs in rural areas. These are one-stop-shops that help companies to become more competitive with regard to their business/production processes, products or services using digital technologies. They are based upon technology infrastructure and provide access to the latest knowledge, expertise and technology to support their customers with piloting, testing and experimenting with digital innovations. Improved digital connectivity, particularly in rural areas like Nash / Great Horwood, where there is the lowest availability gigabit internet, will help facilitate the adoption of agile and hybrid working practices. This in turn will help reduce the need to travel, particularly at peak times.*	**4,** 1, 2, 3	Medium term
EEH000674A	**Stansted to Rye House Strategic Cycle Route (included as part of East Herts LCWIP programme)**	*New strategic cycle route between Stansted and Broxbourne via Bishop's Stortford, Sawbridgeworth and Harlow with different optioneering for on road and off-road provision. Historic England have noted need to look for opportunities to enhance access to heritage assets, especially those which are designated, without harming their significance (including their setting).*	**4,** 3	Medium term

Framework ID	Intervention Name	Intervention Description	Package(s) (Primary Package noted in **bold**)	Indicative timeframe
EEH000629A	**Strategic Mobility on Abbey Line at Park Street**	*Investigation of potential for Park and Ride sites on the Abbey Line corridor linked to the HERT system to intercept trips on the A414 and A405.*	**2,** 3, 4	Medium term
EEH000695A	**Strategic Mobility Hub at Newlands Park and Ride (Luton)**	*Opportunity for the new strategic mobility hub to be developed adjacent to M1 Junction 1 as a park and ride facility integrated with local bus services and aimed at reducing the number of private vehicles travelling further into Luton, with the possibility for the scheme to be developed and or integrated with the proposed Newlands Park commercial gateway area.*	**1,** 4	Medium term
EEH000635A	**Watford Bus Priority Scheme (including delivery of BSIP programme)**	*Package of bus priority improvements (funded by the BSIP programme) in Watford town centre.*	**2,** 3	Medium term
EEH000637A	**Watford to Croxley HERT Link**	*New dedicated passenger transport route (trackless tram or Very Light Rail) between Watford Junction and Croxley station along the discussed railway corridor. Services to be integrated as part of the HERT system. Some on street running likely in Watford town centre making use of bus priority improvements*	**2,** 3, 4	Medium term
EEH000636A	**Watford to Croxley Active Travel Corridor**	*New active travel route along the Watford to Croxley Link corridor - this will include some sections of segregated cycleway alongside the link and where this is not possible provision on parallel routes. Active travel links to W2CL stations will also be enhanced.*	**2,** 3, 4	Medium term
EEH000689A	**Zero Emissions Buses**	*Reduce local air pollution, noise and emissions through introduction of zero emissions vehicles across all routes in study area.*	**5,** 1, 2, 3, 4	Short term

Get in touch

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