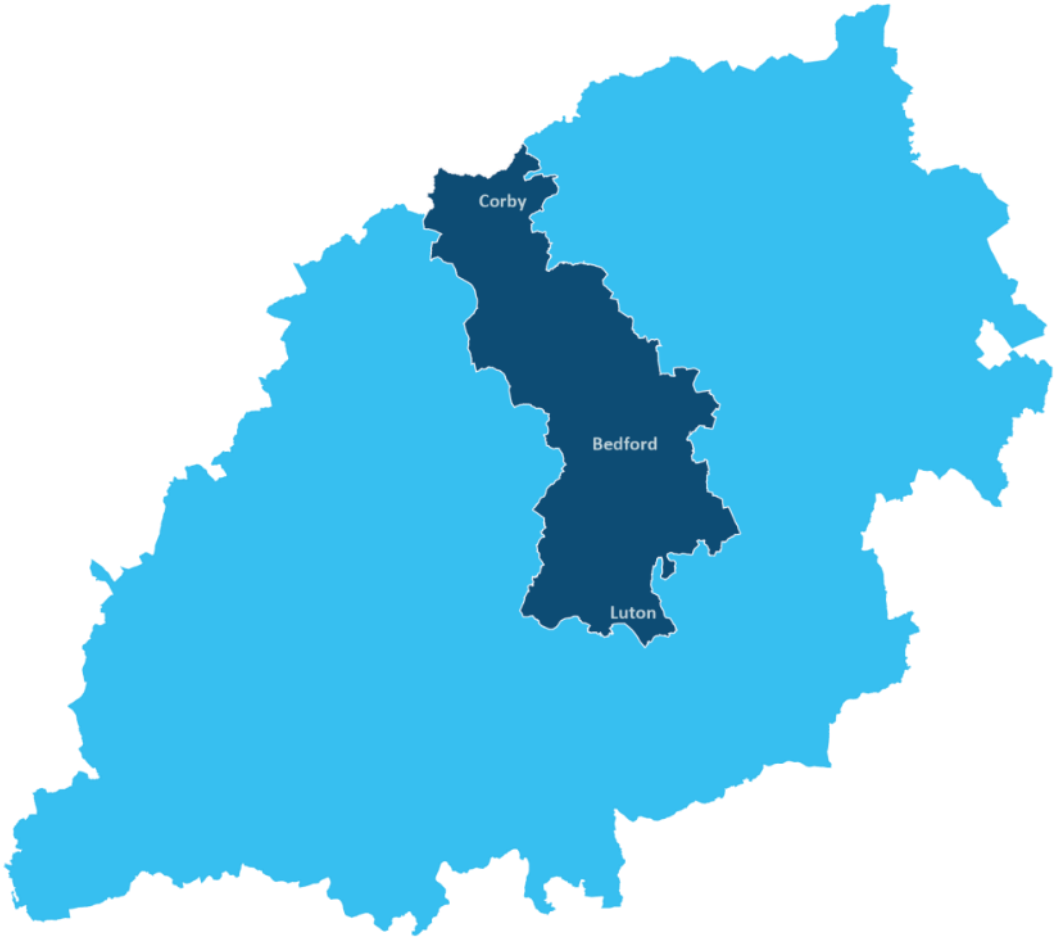
ENGLAND'S ECONOMIC HEARTLAND



Luton – Bedford – Corby

Connectivity Study

Evidence Base Report

March 2024

v1.0 Draft for EEH Review

Prepared in partnership with

steer wsp

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Evidence Base Report for England's Economic Heartland's Luton – Bedford – Corby Connectivity Study

Prepared by:

Steer
14-21 Rushworth Street
London SE1 0RB
+44 20 7910 5000
www.steergroup.com

WSP
62-64 Hills Road
Cambridge, CB21LA
01223 558050
www.wsp.com

Project ID: 24003408

Prepared for:

England's Economic Heartland
c/o Buckinghamshire Council
Walton Street
Aylesbury
HP20 1UA
+44 1296 382703
englandseconomicheartland@englandseconomicheartland.com
www.englandseconomicheartland.com

Contents

List of Tables

List of Figures

Executive Summary

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 founded 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.

The "*Luton – Bedford – Corby Connectivity Study*" is led by EEH, supported by a consultancy team comprising Steer, WSP, and 5th Studio. This is the sixth and final Connectivity Study in the programme and the focus of the study is to build on the previous five studies by focusing on the Midland Main Line rail and A6 road corridors leading north from Luton via Beford and Corby to the northernmost boundary of the EEH region.

Study six will also consider connections to and from these corridors where interventions have not been previously considered in an earlier study (or where the nature of or need for an intervention has substantially changed).

The purpose of this report is to present a 'baseline' of key information, that can support subsequent identification and recommendation of interventions as part of the Connectivity Study. It details existing and growing challenges and opportunities facing the transport network within the study area along with clear 'critical success factors' and objectives to address the identified issues.

Recommendations from this study to be incorporated into the EEH Investment Prioritisation Framework. Based on a detailed methodology, the Framework is a dynamic tool intended to record, track, and assist in the prioritisation of strategic transportation interventions that have been proposed in or may significantly impact the EEH region. These range from new and improved infrastructure to service changes and vary in detail from high level opportunities through to schemes with detailed business cases.

Key evidence base findings

- Transport movements in the study area are dominated by significant north-south routes of the M1, A6, and Midland Main Line (MML) that provide vital local and onward road and rail connectivity.
- Infrastructure connectivity varies across the study area and in coming years will be transformed through major infrastructure currently under construction, notably HS2 Phase 1 and East West Rail (EWR) Phase 2 (Bletchley to Bedford), as well as future EWR Phase 3 (Bedford to Cambridge). These schemes are forecast to release capacity on existing local road and rail networks, with HS2 Phase 1 expected to have a particular impact on passenger and freight movement on the M1 and West Coast Main Line (WCML) corridors.
- The study area is home to a resident population of approximately 980,000 people, notably concentrated in the large urban centres of Luton, Bedford, Corby, and Kettering.
- There are key differences in characteristics across the study area, such as dense urban populations along the north-south A6-MML transport spine compared to comparatively more sparsely populated rural areas.
- Income levels and relative deprivation varies across the area along with comparative access to key services and jobs by public transport and walking compared to driving. As such, improving connectivity and equality of access opportunity across the various socioeconomic groups while achieving net zero carbon emissions is a key challenge facing the region.
- In addition to large quantities of through traffic, the area also contains major origins and destinations that create a significant volumes of road traffic both within and through the area. The study area contains significant intraurban commuter journeys and overall is a net exporter of labour for employment.
- There is a strong national, regional, and local policy and strategy landscape looking to drive a more inclusive and sustainable transport network and services. The region must decarbonise its transport network with the aspiration to do so by 2040 instead of the legally required 2050.
- The region can help enable effective delivery of nationally significant major infrastructure projects and foster future growth in high quality jobs and education opportunities for an increasing number of residents.
- Significant growth of population and housing is forecast and needs to be accommodated in a more sustainable and less private car-centric manner. This creates opportunities to ensure new development and transport infrastructure are integrated and well designed to help facilitate transition to an equitable, accessible, and decarbonised region.
- An assessment of the strengths, weaknesses, opportunities, and challenges provides the need for intervention and will shape the identification and recommendation of proposed interventions to improve transport services and infrastructure. It also identifies opportunities to change the embedded patterns of behaviour through policy, scheme, and initiative delivery.

Study Objectives

A key lesson from the Connectivity Study programme was the benefit of having more consistent objectives to focus project team and time-constrained stakeholder attention on considering the needs and opportunities of the study area. As such, from Study Four onward the following set of common objectives have been used and were endorsed by the Steering and Stakeholder Groups formed for this study.

The 10 objectives are based on the issues and opportunities identified in the wider region and are centred around the four key strategic principles from the Transport Strategy:

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 test the final packages of recommended interventions, a common set of **nine outcome-focused critical success factors were also identified for the programme**.

As with the objectives these were also endorsed by the Steering and Stakeholder Groups.

These factors have been developed to provide:

- an articulation of the need for intervention;
- specificity around the outcomes that need to be achieved through each Connectivity Study without defining what interventions are required for achieving those outcomes;
- the "missing step" between issues and opportunities and option development; and
- a basis for the Multi-Criteria Assessment Framework (MCAF) that will be used to assess the long list of transport interventions.

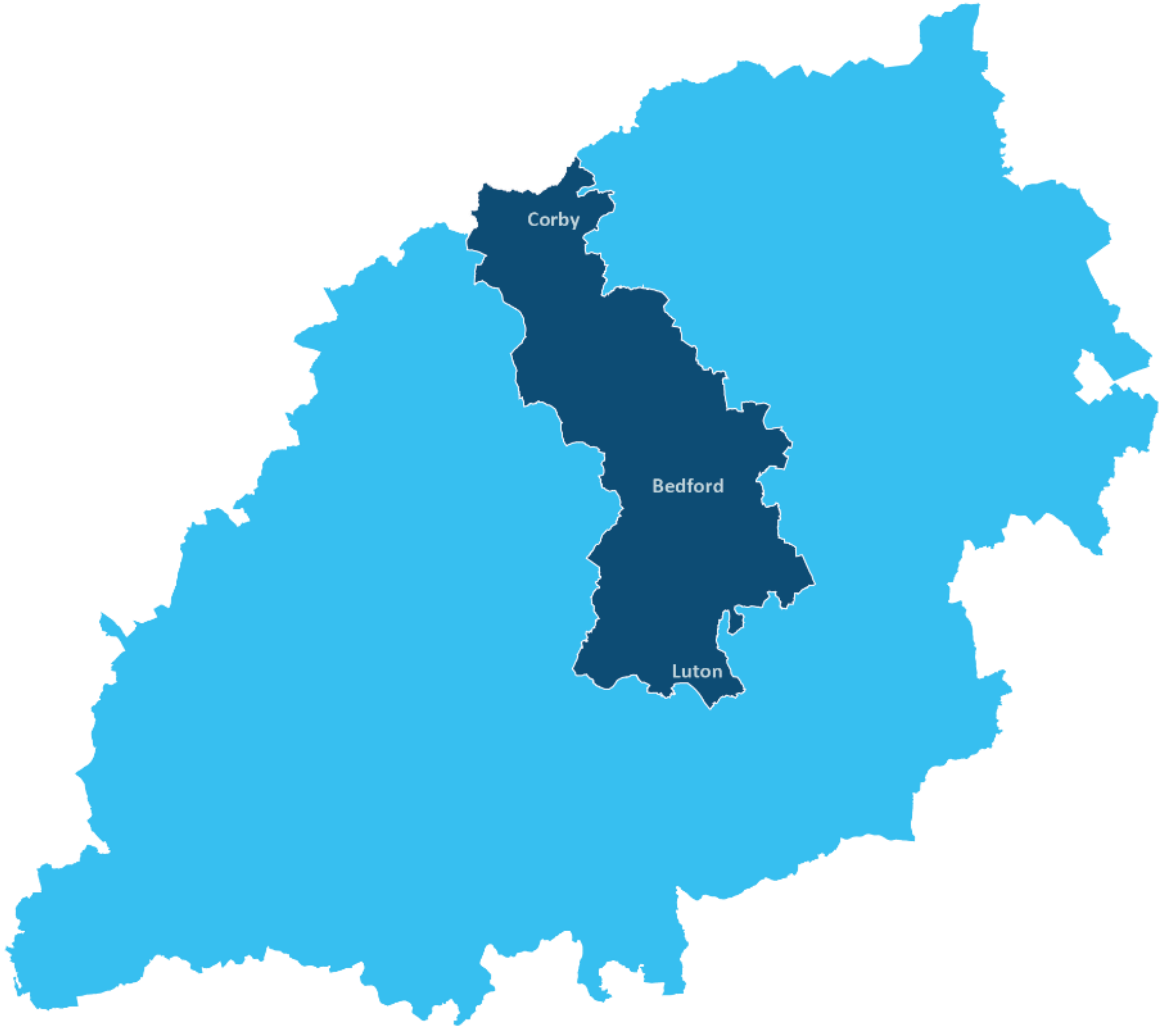
The critical success factors are drawn from:

- The evidence base;
- The call for evidence;
- Previous steering group inputs; and
- Inputs from stakeholder workshops and discussions.

The Critical Success Factors for this study are:

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 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 all local and first mile last mile journeys, contributing to better connectivity, increased health benefits through increasing physical activity and improved air quality.

1 Introduction



The Ambition

The region England's Economic Heartland (EEH) supports is an economic and innovation powerhouse, home to world-leading universities and innovators. It is blessed with a natural, historic, and built environment that makes it an attractive place to live and work. EEH aims to harness these attributes to the benefit of both existing communities and future generations.

Our 2021 Transport Strategy, ***Connecting People, Transforming Journeys***, **emphasises that investment in the transport system will continue to be essential in order to enable economic growth in a sustainable way.** At the same time, changes must be made to the way in which investments are planned, developed, and delivered.

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

Lack of capacity within the current transport system acts as a constraint on growth and reduces resilience and reliability, all of which impacts productivity. Lack of choice in travel options also act as a constraint on access to the full range of jobs, homes, services, and amenities the region has to offer. The environmental impact of our transport system is unacceptable, with carbon emissions in many parts of the study area are significantly above the national average.

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.

The "*Luton – Bedford – Corby Connectivity Study*" is led by EEH, supported by a consultancy team comprising Steer, WSP, and 5th Studio. This is the sixth and final Connectivity Study in the programme and will build on the previous five studies. The study aims to identify a preferred package of multi-modal interventions that deliver the required connectivity outcomes that help achieve EEH's objectives identified within the Transport Strategy.

The purpose of this report is to present a 'baseline' of key information, that can support subsequent identification and recommendation of interventions as part of the Connectivity Study. It details existing and growing challenges and opportunities facing the transport network within the study area along with clear 'critical success factors' and objectives to address the identified issues.

Investment Prioritisation Framework

Recommendations from this study to be incorporated into the EEH Investment Prioritisation Framework developed over the same time as studies four and five.

Based on a detailed methodology, the Framework is a dynamic tool intended to record, track, and assist in the prioritisation of strategic transportation interventions that have been proposed in or may significantly impact the EEH region. These range from new and improved infrastructure to service changes and vary in detail from high level opportunities through to schemes with detailed business cases.

The Vision

Our Transport Strategy provided the step-change in approach required, with its overarching vision:

"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."

This ambition requires a shared commitment between the partners in the region and national government for bold decision making that puts people and the environment at its centre. It looks to realise synergies with other policy areas that have a major impact on the way people travel, including spatial planning, digital infrastructure, utilities, education, and health. The Strategy is guided by four key principles:

- **Principle 1**: Achieving net Zero no later than 2050, with an ambition to reach this by 2040.
- **Principle 2**: Improving quality of life and wellbeing through a safe and inclusive transport system accessible to all which emphasises sustainable and active travel.
- **Principle 3**: Supporting the regional economy by connecting people and businesses to markets and opportunities.
- **Principle 4**: Efficient movement of people and goods through the region and to international gateways.

Methodology

This Connectivity Study is being undertaken in four phases:

- **Phase 1**: Methodology Development
- **Phase 2**: Setting the Scene
- **Phase 3**: Producing Recommendations
- **Phase 4**: Final Package of Interventions

This report focuses on Phase 2 which includes a summary of the findings of the first four steps of the Department for Transports (DfT's) *Transport Appraisal Process*, shown in Table 1-1. This information will **assist in the identification of multi-modal interventions which seek to address the underlying causes of the identified challenges**, whilst also providing opportunities for existing and future communities.

Table 1-1 DfT Transport Appraisal Process[1]

Step 1: Understanding the Current Situation	Step 2: Understanding the Future Situation	Step 3: Establishing the Need for Intervention	Step 4a: Identify Intervention Specific Objectives
• Policy context • People • Place • Connectivity • Movement patterns • Issues and opportunities	• Planned growth • Committed transport improvements • Forecast changes in travel demand	• Key issues and opportunities • Underlying causes and drivers • The case for intervention • Critical success factors	• Objectives

[1] Source: The Green Book, HM Treasury, 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063330/Green_Book_2022.pdf

Report Structure

Consistent with *Connecting People, Transforming Journeys* 'whole system approach', this Phase 2 report summarises our people, place, and connectivity evidence base to demonstrate the existing and growing complex challenges facing the study area along with a clear set of critical success factors and objectives to address the identified problems.

The study recognises that strategic infrastructure issues (and solutions) extend beyond a single area and adopts a cross-border, strategic approach to assessing connectivity and movement. The study goes beyond more localised approaches to addressing transport issues, like Local Transport Maps, to identify strategic interventions that meet the ambitions of the study area. This reflects EEH's function as a Strategic Transport Body which has the aim of ensuring that regional investment in transport is 'joined up'.

The remainder of the report is structured as follows:

Part 2: The Study Area - Identifies the geography, population centres and settlements, key characteristics and features of the study area in terms of active travel uptake, public transport links and significant road and rail links.

Part 3: Policy Context - Reviews relevant national, sub-national and local policy and strategy documentation in order to help set out the overarching objectives and priorities for the study area which will assist in guiding the development of recommended interventions and how they will be packaged.

Part 4: Current Context (People) - This section reveals demographic data and information on the people living and working within the study area.

Part 5: Current Context (Place) - The current context in terms of place, with the identification of environmental constraints and opportunities and details of location-based issues such as air quality, safety and carbon emissions.

Part 6: Current Context (Connectivity) - The existing digital and transport networks within the study area, including data on current modal and movement patterns as well as a connectivity challenges and opportunities in the area.

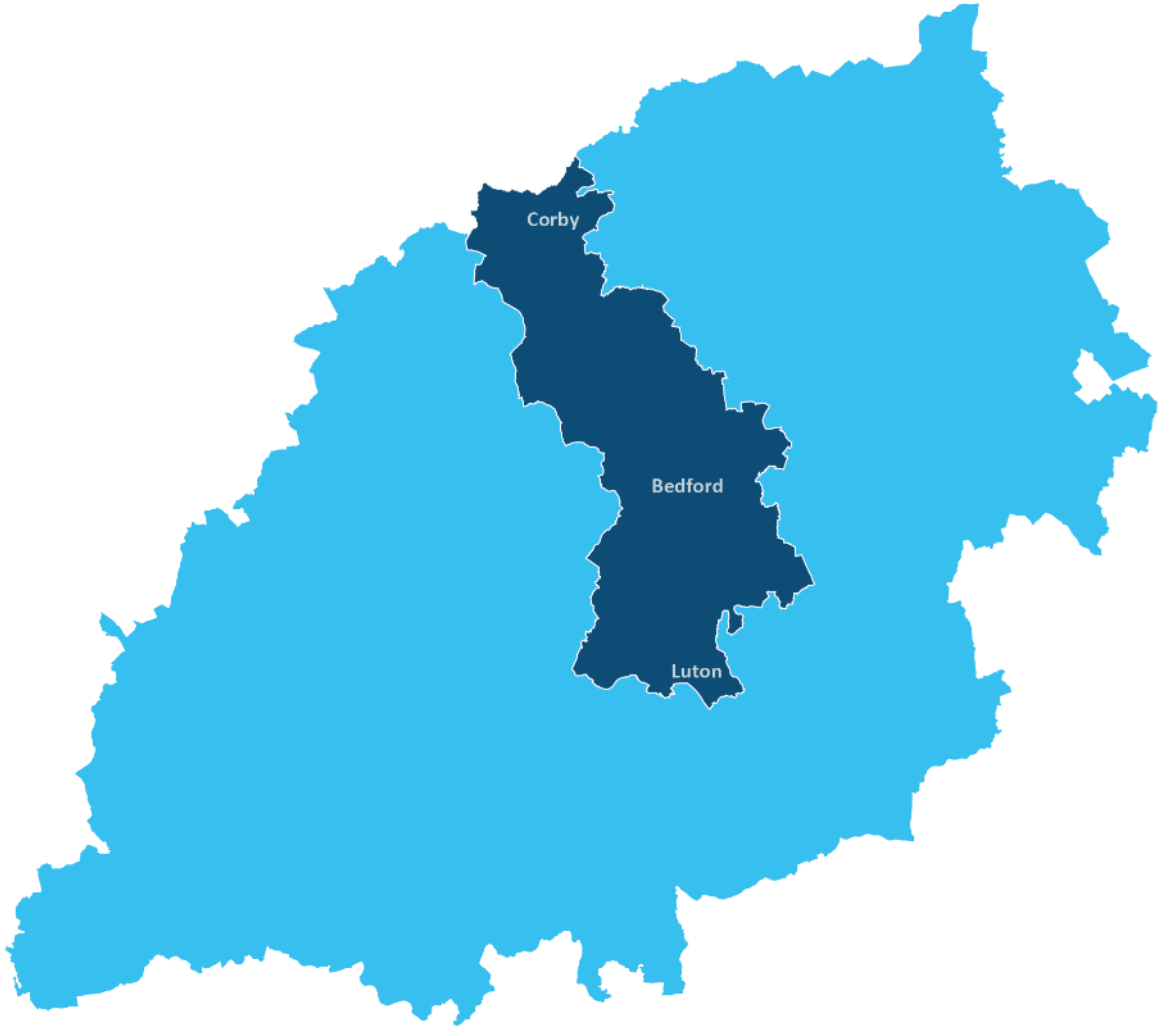
Part 7: Stakeholder Engagement - Sets out issues and opportunities raised by stakeholders through the Steering and Stakeholder Group workshop sessions, as well as the confirmed study objectives and Critical Success Factors.

Part 8 Future Context - Sets out the scale of the growth challenge within the study area and potential implications resulting from planned growth if transport interventions are not implemented to address issues identified in the Evidence Base. Committed and proposed transport interventions which will impact capacity and connectivity for the study area are also discussed to understand the future baseline position in terms of transport provision and accessibility.

Part 9: Need for Intervention - Summarises the case for intervention based upon an understanding of the study area today, the scale of the growth challenge, and the underlying drivers and causes of the issues identified through the Evidence Base. It provides a Strengths, Weaknesses, Opportunities and Constraints (SWOC) analysis of the study area.

Part 10: Next Steps - This section sets out the next steps with the study.

2 The Study Area



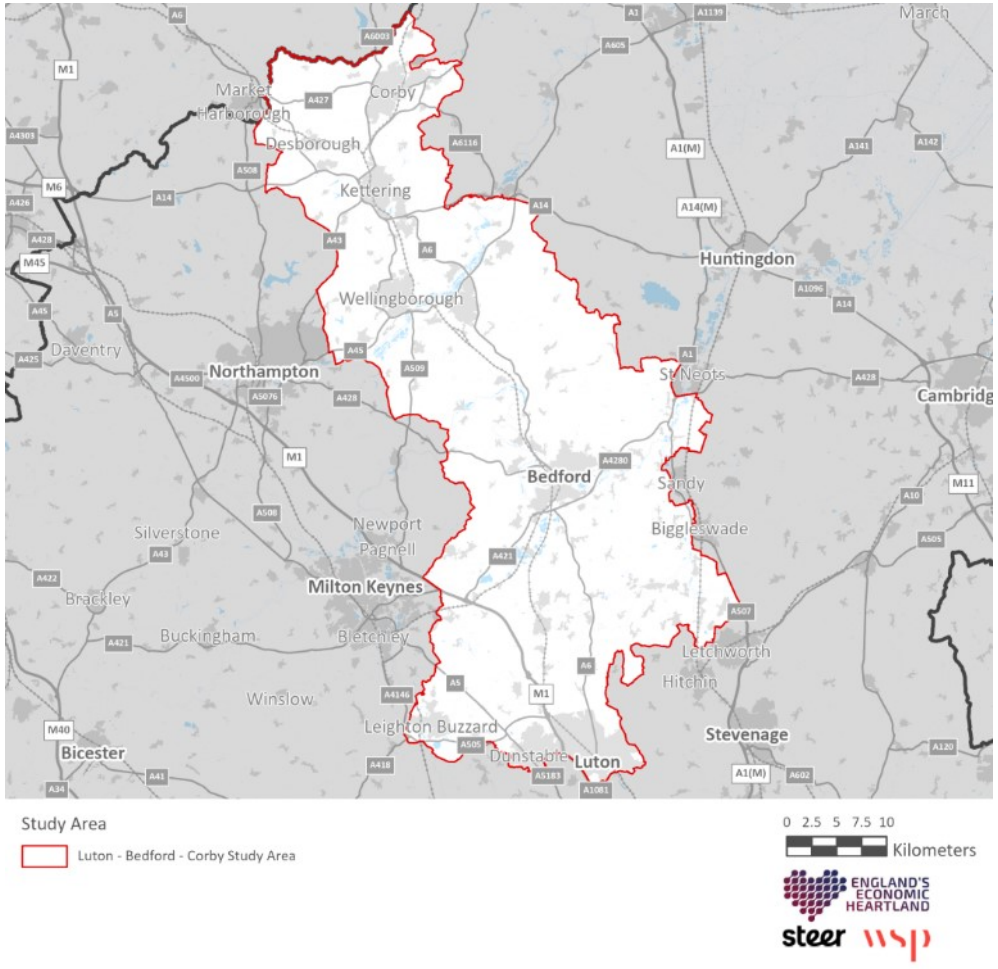
Overview

The study area for the Luton – Bedford – Corby Connectivity Study (Figure 2-1 and Figure 2-2) includes areas across Luton Borough, Bedfordshire, and Northamptonshire with several key settlements such as Luton, Bedford, Kettering, and Corby. Dominated by north-south movements between the main urban areas, it will also be important to understand and improve east-west connectivity through the area. The Midland Mainline (MML) provides a key rail corridor between the key settlements and beyond to London in the south and Sheffield to the north. The A6 is a primary highway connection for north-south movements, varying between single and dual carriageway operation.

Additional rail lines in the study area include the Marston Vale Line (Connecting Bedford to Bletchley) that will form part of East West Rail (EWR) Phase 2, and the East Coast Mainline (ECML) at Biggleswade. The lack of rail connection between the MML and ECML restricts effective east-west public transport connectivity across the region, with this being a key driver for EWR Phase 3 between Beford and Cambridge via a new ECML interchange near St Neots.

In addition to the A6, several other routes on the Strategic and Major Road Networks (SRN and MRN) facilitate movements in the area including the A14, A421, A5, A507, A4280, A45, A43, A427, A509 and the A6116. A small section of the M1 runs through the southern section of the study area. The area also includes the international gateway of Luton Airport, a significant generator of travel demand for passengers, employees, and freight. The airport saw more than 13 million air passengers in 2022[2], a decrease since 2019 of almost 5 million (almost 27% reduction). Owned by Luton Borough Council, the airport is also exploring options for further development and expansion.

Figure 2-1 Study Area Overview Map[3]



The area is an attractive place to live, exhibiting diverse social characteristics, a strong economy and with relatively good transport connectivity. However, the

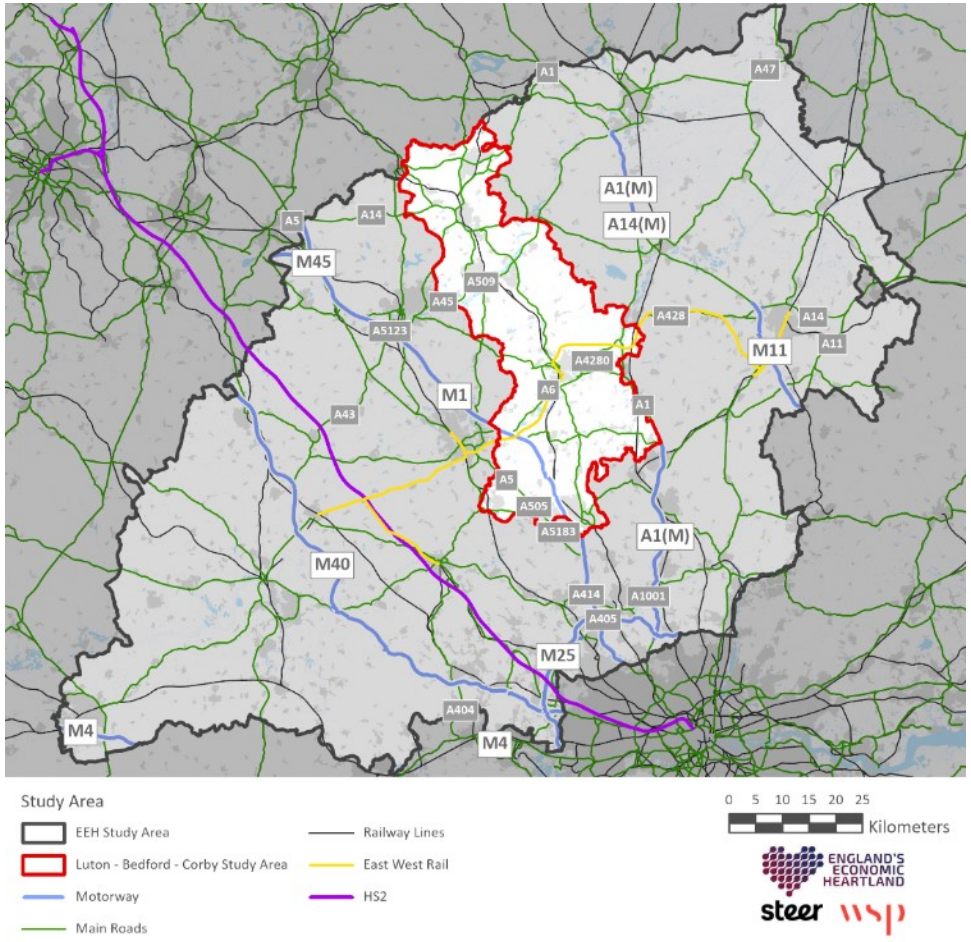
[2] Source: UK Civil Aviation Authority, 2022, https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/uk-airport-data/uk-airport-data-2022/

[3] Source: Authority Boundaries, ONS, 2022 https://geoportal.statistics.gov.uk/

nature of the study area results in complex social, economic and connectivity challenges to be addressed and opportunities to be maximised:

- **Decarbonisation**: The area exhibits a complex pattern of intra and inter-urban movements through rural areas based on an existing infrastructure network designed for motorized vehicles and lacking in a comprehensive public transport and integrated active travel network. As such a significant change in infrastructure, digital connectivity, planning, policy, and behaviour change is required to achieve net zero by 2050.
- **Connectivity**: Despite a robust network of highways and rail links, some rural areas cannot access key services and facilities within 45-minutes travel by foot and public transport. This is a particular issue for smaller towns, especially those that do not benefit from a nearby railway station.
- **Innovation**: Harnessing innovation is a key priority for EEH. The study area contains economic assets providing the opportunity to build on the global leadership of innovation within science and technology. The aspiration is for the region to grow its position as an "innovation powerhouse" to deliver further and sustainable economic growth.
- **Levelling Up**: The Indices of Deprivation (IMD) report on the relative level of deprivation across England. The study area has pockets of areas which are considered both within the top 10% most deprived and the top 10% least deprived, illustrating varying levels of opportunity and a complex mix of differing needs and challenges, including around affordable and accessible transport and barriers to employment, education and training, healthcare, social, leisure, physical and cultural activities.

Figure 2-2 Study area in EEH context[4]



[4] Source: Authority Boundaries, ONS, 2022 https://geoportal.statistics.gov.uk/

Significant Road Links

The study area encompasses both regionally and nationally significant road and rail links. The strategic transport routes connecting the study area with the wider EEH region described below. Roads forming part of the Strategic Road Network managed by National Highways:

- The **M1** runs across the southern section of the study area connecting Luton & Dunstable to Milton Keynes. The study area includes junctions 11,11A, 12 and 13, creating connections to the A421, A5120 and A5.
- The **A421** connects the M1 (J13) to Bedford and further to the M1 (with extension proposed to Cambridge via the A428).
- The **A45** is a major link connecting Northampton to Rushden and Higham, with connection to the A14 at J13.
- The **A14** crosses East/West at the north of the study area Connecting Kettering to Cambridge and Coventry.

Key road links managed by Local Highway Authorities:

- The **A6** offer the main North/South connection between Luton, Bedford, Rushden and Kettering throughout the study area, altering between both single and dual carriageways.
- The **A427** runs through the centre of Corby and connects to the A6 at Market Harborough.
- The **A43** offers a key connection between the A14 and A427 as well as a further connection from the study area to Stamford.
- The **A509** is a connection between Wellingborough and Kettering, with further connections to Milton Keynes.

London Luton Airport

The study area includes the international gateway of Luton Airport which generates significant travel demand through the study area, both for passengers and employment.

London Luton Airport offers flights to a variety of destinations, the majority of which are located in Europe. The most popular destinations from this airport in 2022 were Bucharest, Amsterdam, Malaga, and Budapest. Passenger usage of Luton airport saw more than 13 million air passengers in 2022[5], this has been a decrease since 2019 by almost 5 million (Almost a 27% reduction).

The Luton Rising project proposed an expansion to the existing Luton Airport capacity with a new passenger terminal. An increase of 11,000 new jobs to serve up to 32 million passengers is expected by 2041 with the delivery of the new terminal which will also help to mitigate the local environmental impacts and contribution towards climate change. Future transport interventions should be considered to help improve connectivity between London Luton Airport and the rest of the EEH region to help maximise the economic benefits for both passengers and employee movements.

[5] Source: UK Civil Aviation Authority, 2022, https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/uk-airport-data/uk-airport-data-2022/

Where People Live

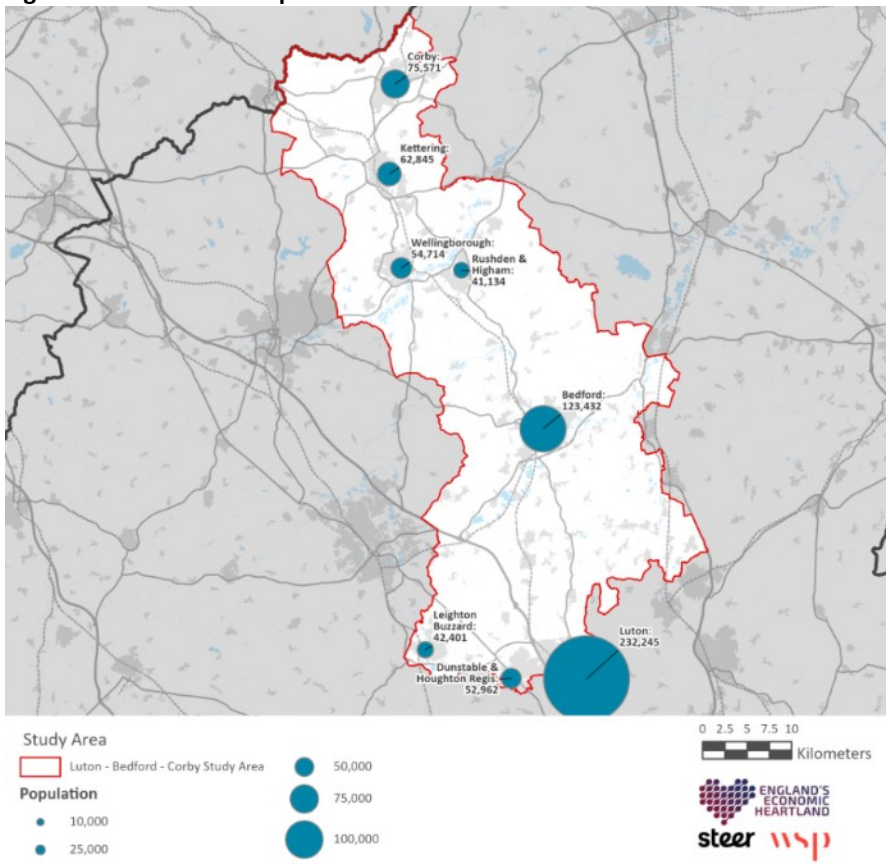
The study area includes 8 key settlements (see Table 2-1 and Figure 2-3) with these playing an important economic role within the study area and wider EEH region by having a significant residential population and/or employment offering.

The largest urban area is Luton which has a population of 232,245. This is almost twice the size of the next most populous settlement in the area, Bedford.

The majority of the study area population reside in one of these eight key urban settlements, consisting of 70% of the total population. Future transport interventions should take account of the needs of the existing and growing urban populations, but also not leave rural communities with limited access to sustainable transport options.

The settlement with the largest number of employees[6] in the study area is Luton, with 103,980 employees (Table 2-1).

Figure 2-3 Settlement Population 2021[7]



[6] People who are in full or part time employment, including self-employed in the study area.

[7] Source: Population estimates, ONS, 2021, https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates

Table 2-1 Key Settlements[8]

Key Settlements	Population (2021)	Employment* (2021)	Employees (2021)
Luton	232,245	102,287	103,980
Bedford	123,432	60,038	59,160
Corby	75,571	38,774	35,960
Kettering	62,845	31,010	34,550
Wellingborough	54,714	26,834	28,570
Dunstable and Houghton Regis	52,962	26,674	18,720
Leighton Buzzard	42,401	21,772	13,820
Rushden and Higham Ferrers	41,134	20,554	14,100
Rural Areas**	293,912	148,913	92,340
Study Area	979,216	476,856	401,200
EEH Total	5,382,136	2,669,816	2,670,345
England and Wales Total	59,597,747	27,773,564	27,704,995

** 'Employment' refers to the number of people living in the area who are in employment.*
*** Rural Areas refers to all Middle Super Output Areas within the corridor but not within a key settlement.*

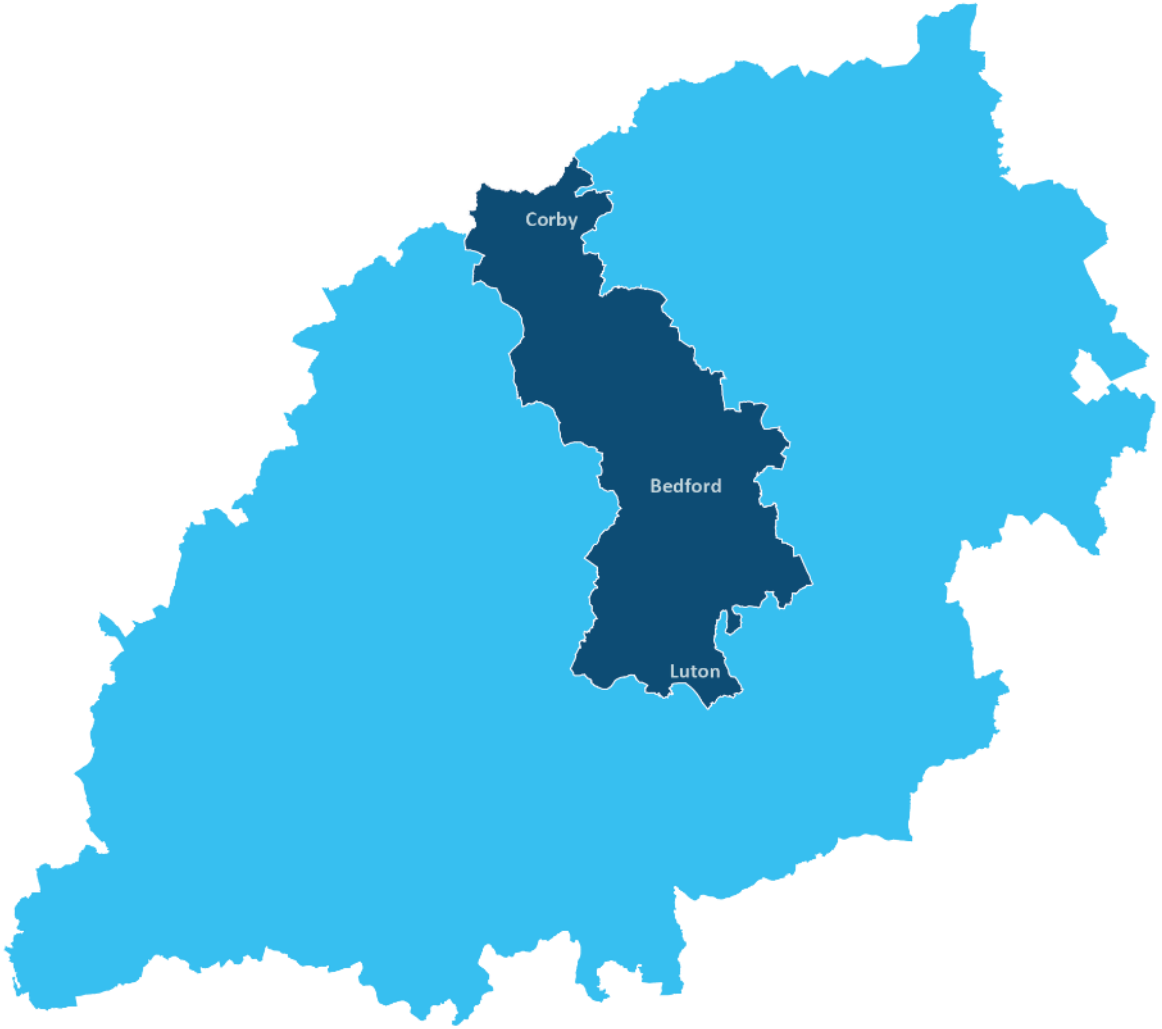
Several smaller settlements have a disproportionate number of employed populations and employees such as Kettering, Leighton Buzzard, and Dunstable and Houghton Regis. This indicates that a notable amount of inter-urban commuting is taking place throughout the study area.

A difference in employment and employees of more than 75,500 takes place in the study area, indicating notable commuting to outside the study area to other key employment locations, likely Milton Keynes, London, Northampton, and Cambridge.

The difference between the employment and employees indicates notable commuting from several smaller urban areas within the study area. To help promote more sustainable travel patterns, new active travel and public transport improvements should identify the highest inter-urban commuter flows to help reduce the dominance of private cars within the area.

[8] Source: Population estimates, ONS, 2021, https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates

3 Policy Context



This section sets out the current economic, environmental and transport policies relevant to this study and the study area itself.

National Policy

National transport policy has historically been focused on delivering the infrastructure required to meet future travel demands and to enable economic growth. More recently, policy has made a focus on sustainable modes, reducing carbon emissions and levelling-up access to opportunities.

National Planning Policy Framework (2021) sets out the Government's planning policies for England and how they should be applied. At the heart of the NPPF is the presumption in favour of sustainable development and it recognises that there are three separate, but inter-linked, pillars to sustainability: economic, social and environmental.

Clean Air Strategy, DEFRA (2019), confirms the Government's commitment to encouraging travel by lower emission modes of travel, including public transport (bus, light rail, rail) and active modes as these modes are less polluting than private cars.

The Clean Growth Strategy, DEFRA (2018), promotes the shift towards low-carbon transport, including low emission vehicles, walking and cycling.

Transport Decarbonisation Maps, DfT (2021) sets out the Government's commitments and the actions needed to decarbonise the entire transport system in the UK. It includes our pathway to net zero transport in the UK, the wider benefits net zero transport can deliver and the principles that underpin our approach to delivering net zero transport.

UK National Bus Strategy, DfT (2021) sets out the governments vision for better bus services across England through ambitious and far-reaching reform of how services are planned and delivered. Bus services are to be transformed with simpler fares, thousands of new buses, improved routes and higher frequencies.

Road Investment Strategy 2 (2020) Outlines Highways England's (now National Highways) long term strategic vision for how the strategic road network should look like in 2050, using forward thinking and new technologies to promote a safer, more integrated, smarter and greener network for all users and modes, including high quality routes for active travel modes.

Gear Change, DfT (2020), sets out the Government's future vision for walking and cycling to become the natural first choice for many journeys., including a target is for over half of all journeys in our towns and cities to be undertaken on foot or by cycle by 2030.

The Road to Zero, DfT (2018), highlights the importance of bus services in encouraging mode shift to more sustainable and less polluting modes of travel. The document supports and the introduction of zero-emission buses through new funding opportunities.

Future of Mobility: Urban Strategy, DfT (2019), Supports new modes of transport and new mobility systems that encourage walking and cycling for short journeys, provide efficient and low emission mass transit, improve public transport reliability, responsiveness, accessibility, affordability, safety, reduce congestion and support the transition to a low carbon future.

Rail Network Enhancements Pipeline, DfT (2018), sets out an approach that applies for rail enhancements within England and Wales. It represents a rolling programme of investment into new or improved infrastructure that enable service changes and other benefits to passengers, freight users and the economy. The investments will enhance the capability of the railway, typically adding increased or new capacity or providing technical improvements to the way the railway runs.

Sub-national Policy

Connecting People, Transforming Journeys, EEH (2021), provides the EEH region and government with an evidence-based, vision-led framework focused on enabling economic growth in a way that delivers a net zero transport system as early as 2040. Enabling growth in a way that improves the environment requires a fundamental switch in the way the region's transport system is planned and delivered.

Connectivity Studies Programme, EEH (2021-25) a programme of six studies examining areas of the region in more detail to identify packages of multimodal infrastructure, service, or policy interventions to help achieve the Transport Strategy's objectives and inform investment prioritisation.

Investment Prioritisation Framework, EEH (2024) is based on a detailed methodology and is intended to record, track, and assist in the prioritisation of strategic transportation interventions that have been proposed in or may significantly impact the EEH region.

Passenger Rail Study, EEH (Phase 1 2020 and Phase 2 2021) Phase 1 provides a baseline assessment of existing rail networks and levels of service across the EEH region, highlighting some key connectivity gaps. In response to this, Phase 2 identified aspirational service levels for priority journey pairs where analysis demonstrated stronger connectivity by rail would generate a significant return on investment.

Pathways to Decarbonisation, EEH (2020) considered the proposed pathway to decarbonisation to help inform the Connecting People, Transforming Journeys Transport Strategy. A total of five pathways (with associated assumptions) were modelled and, in consideration of the outcomes, EEH identified two preferred pathways: Highly Connected Future (increased use of digital communications and embedded technologies in the transport network) and Policy-Led Behaviour Shift (achieved through road pricing and education measures).

EEH Freight Study, EEH (2019) defines a clear starting point for freight sub-nationally. It analyses the implications of future scenario changes and identifies how EEH can capitalise on opportunities and mitigate risk. The study assists in planning the most efficient ways of providing access to goods that unlocks economic potential, protects the environment and communities, and future-proofs networks to accommodate growth and improve efficiency.

EEH Regional Bus Strategy, EEH 2022 is a long-term plan to support the role of schedules bus and coach services in the region. EEH is working with local authorities and EEH Bus Operators Association to support the delivery of Bus Service Improvement Plans (BSIP), improve key strategic intra-regional bus routes and lead options for pan-regional ticketing and integration solutions.

EEH Active Travel Strategy, EEH (2022 and 2023) is split into Part 1 The Ambition and Part 2 The Opportunity. Part 1 describes a high-level ambition for active travel in EEH and explored challenges and opportunities regarding active travel in the region. Part 2 defines in more detail what the region should be aiming towards in terms of achieving excellence in active travel. Overall, the strategy seeks to create a clear policy direction for active travel and identify the missing links in the active travel network.

In addition, there are several other evidence base studies EEH have produced, this includes Mobility Hubs Guidance and East West Rail Strategic Narrative[9].

South East Midlands Local Enterprise Partnership (SEMLEP) – Strategic Economic Plan (2017) sets out the strategic investments and future actions for

[9] Source: EEH Publications: https://www.englandseconomicheartland.com/publications-and-responses/

the LEP to continue to grow the economy in their area. The SEP details seven priorities across three core themes; growing business, growing people, and growing places.

Local Policy

The study area encompasses four local authorities: Luton Borough Council, Central Bedfordshire Council, Bedford Borough Council, and North Northamptonshire Council, which all have their own Local Transport Plans (LTP) that set out their own transport objectives, policies, and strategies.

Each district or unitary authority in the study area also has a Local Plan which sets out the future land use and planning policies for the area over a set time period. A number of local authorities have, or are in the process of developing, Local Cycling and Walking Infrastructure Plans (LCWIP), which outline the walking and cycling improvements needed at a local level.

Luton Borough Council LTP 4 2020-2040 (2021) sets out the strategic priorities and policies in Luton Borough with three main ambitions of embracing carbon reduction, reducing poverty and improving inclusion, and ensuring that transport is linked with developments. Their LTP 5 is under development.

Central Bedfordshire Council LTP 3 2011-2026 (2011) outlines a long-term framework for transport investments including a series of objectives, and broad areas of intervention through which schemes will be identified to improve transport network. The key transport proposals feature improvements in highways, passenger transport, walking and cycling to key movement corridors, with major schemes planned to include the A5-M1 link road, a new heavy rail station at Wixhams, and the Luton-Dunstable Guided Busway.

Bedford Borough Council LTP 3 (2011-2021) sets out the transport aims and ambitions along with key strategies, schemes, and initiatives to overcome transport challenges. The Council aims to create a transport system where walking, cycling, and public transport are the primary choices of travel rather than the private car. Their LTP4 is currently proposed.

Northamptonshire Council LTP (2012) is the overarching strategy document that sets out what the former County Council's strategic aims and goals are for transportation in Northamptonshire. The strategy is an overarching document for a series of smaller documents to outline strategies for different aspects of the transport system. It is noted that since the completion to this LTP, Northamptonshire County Council has been split into the two separate unitary authorities of North Northamptonshire and West Northamptonshire.

Luton Council LCWIP (2023-2033) aims to set out a long-term plan in making Luton become a more sustainable town with a connected, inclusive, and safe active travel network that integrates well within the wider sustainable transport network to create a town with cleaner air, and increased mobility. The LCWIP aims to support the objectives of providing convenient routes to key locations, enhanced active travel and inclusive infrastructure, while also increasing the connectivity between Luton town centre to the surrounding borough.

The LCWIP has identified 14 walking routes making up the core walking zone which focuses on routes to and from the town centre as the focus for future walking improvements. Route reviews have been implemented for future infrastructure improvements on junctions and links across Luton's future cycle network.

Various Local Cycling & Walking Infrastructure Plans (LCWIPs) –LCWIPs are under development within North Northamptonshire Council for Kettering, Wellingborough, Northampton, Rushden and Higham Ferrers, and Corby. An LCWIP is also being developed for Central Bedfordshire, which is scheduled to be adopted by December 2023. There is also an LCWIP which is planned for Bedford through a survey from 300 respondents commencing in May 2022.

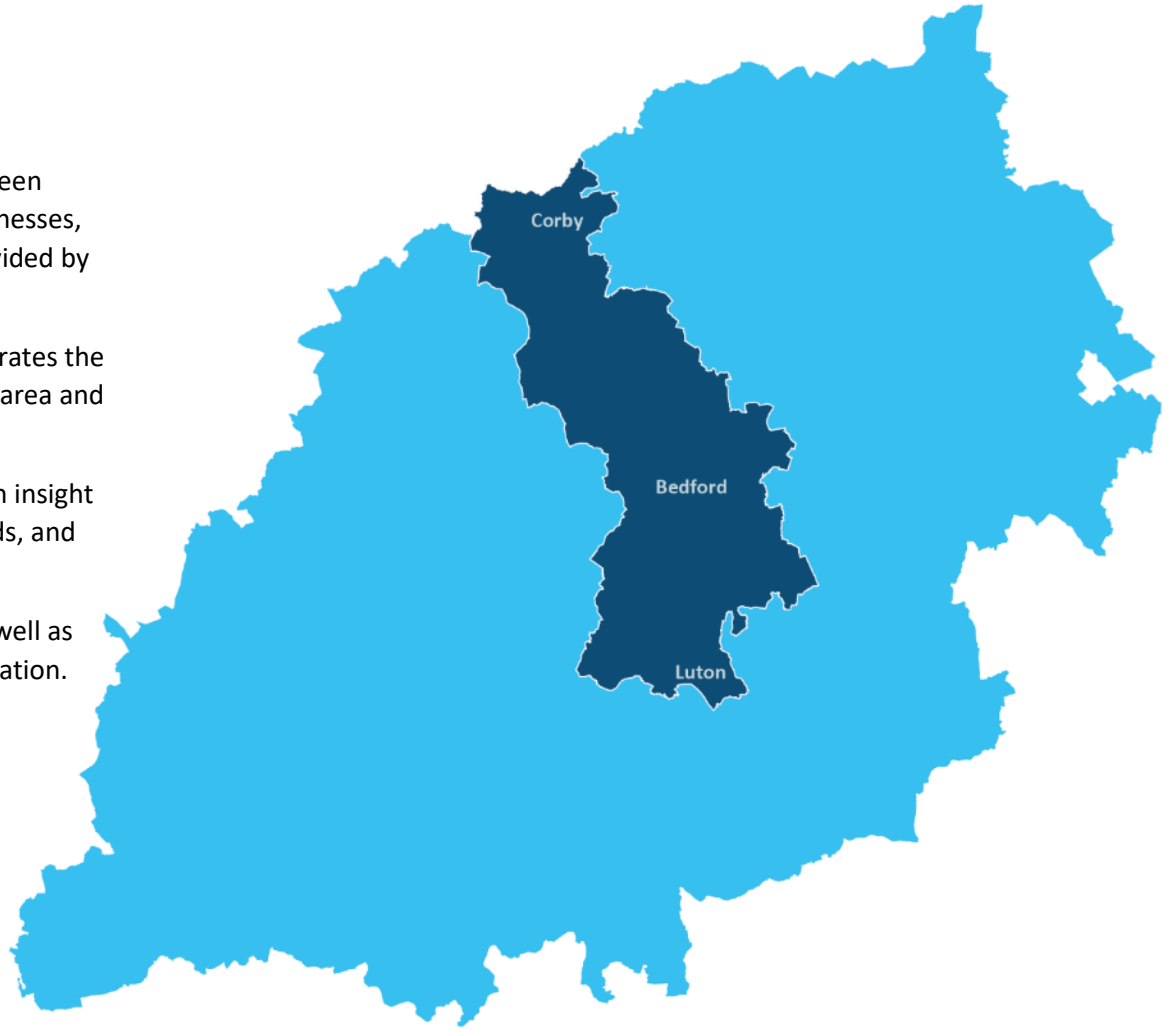
4 Current Context (People)

In order to understand the study area, a 'whole system approach' has been adopted to gain an understanding of the existing communities and businesses, the natural and historic environment and the levels of connectivity provided by the existing transport and digital infrastructure assets.

This section summarises the existing **people,** evidence base. It demonstrates the social and economic diversity and the existing connectivity of the study area and the challenges and opportunities this creates.

The people evidence base presents a set of demographic data to gain an insight into the existing community characteristics of the study area, their needs, and how these can be supported through enhanced connectivity.

Transport interventions should consider varying population density as well as the overall current and future demand for travel for areas of high population. Traditionally, new transport services find higher success in areas of high population density due to the increased demand.



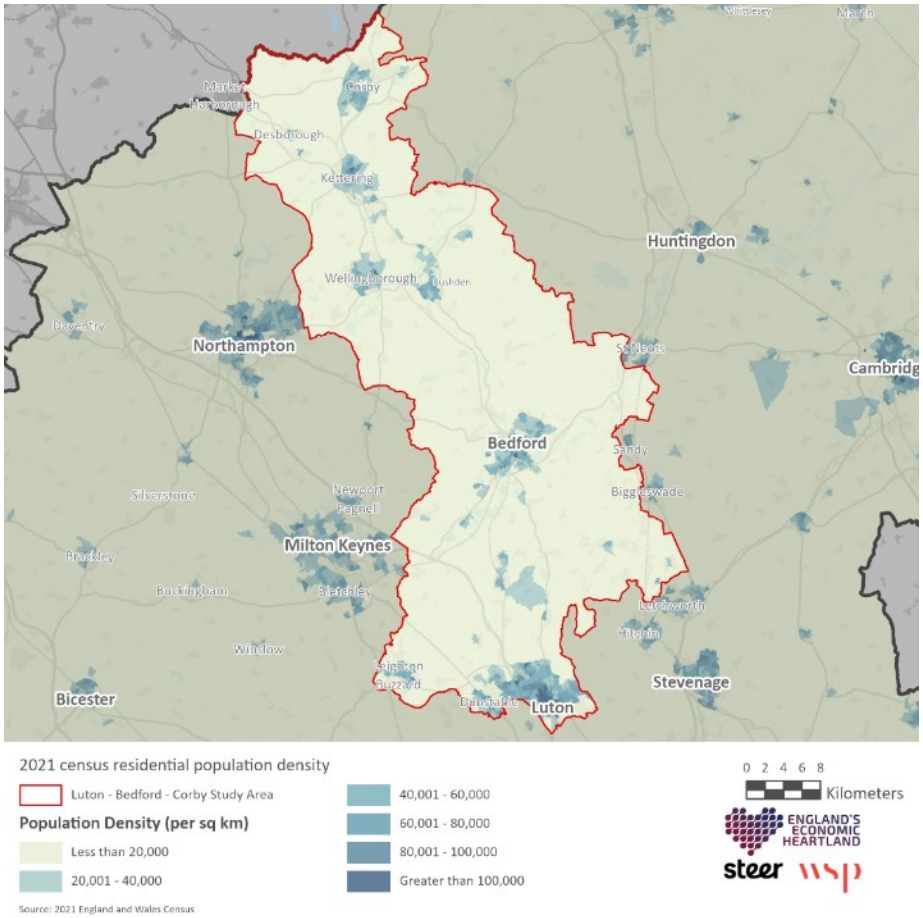
Population

There are approximately 980,000 residents in the study area[8] with the most densely populated settlement being Luton with over 232,000 residents (Figure 4-1). Luton is almost double the size of the next largest settlement of Bedford, which has a population of over 123,000 people. The key settlements in the study area together account for around 70% of the total population. The majority of the population can be found close to the MML and A6, with clusters of urban settlements to the north and south of the study area. The southern half of the study area contains several commuter towns with a particular focus on travel into London such as Luton, Leighton Buzzard, Dunstable and Bedford. The northern half of the study area has several key settlements such as Kettering, Corby, Desborough, Wellingborough, Rushden and Higham which are located within relatively close proximity to each other.

Most of the settlements in the study area are located within areas of comparatively lower population density, for example the area in between Bedford and Rushden, and the areas surrounding Shefford. This can result in higher levels of private car dependency by people traveling to / from these areas as public transport options are often limited and active travel is often not feasible due to poor or unavailable infrastructure.

While improving choice and resilience in both rural and urban areas is possible, it is likely to be challenging to achieve modal shift away from the private car in more isolated areas such as Ampthill and Shefford. This is because compared to denser urban areas and town centres, residential dwellings and employment opportunities are often located further apart which makes the provision of infrastructure more expensive per capita and increases the need for operational investment for services that would not be commercially viable based on the number of available users.

Figure 4-1 Study Area Population Density[10]



[10] Source: Population density, ONS, 2021, https://www.ons.gov.uk/datasets/TS006/editions/2021/versions/4

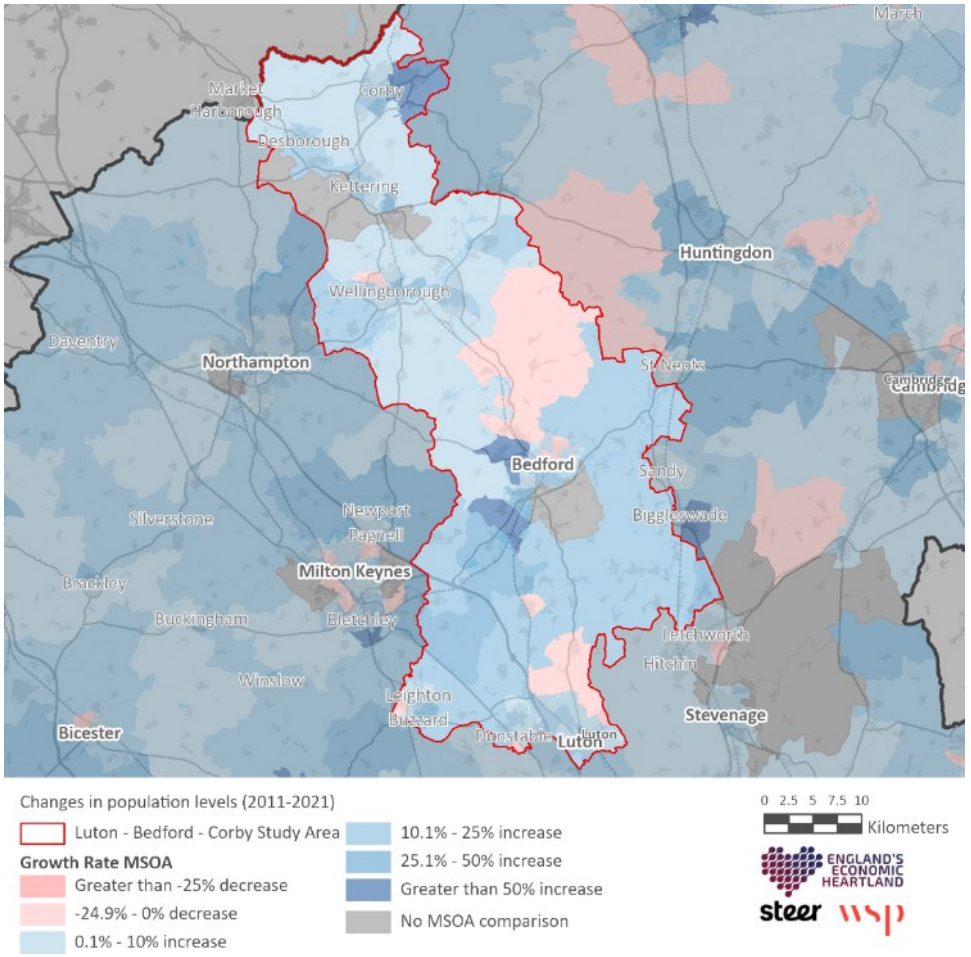
Population Growth (Historic)

Between 2011 and 2021 the population of the study area grew by 14%, from approximately 858,000 people in 2011 to approximately 979,000 people in 2021 (Figure 4-2). This is a higher growth rate than the11% EEH regional average. The highest growth in (exceeding 50%) was observed in the areas of Biddenham, Wooton, Bedford, and east of Corby. This relatively high level of population growth has been driven in particular by several new housing developments such as Wooton Park and Saxon Park surrounding Bedford. The Priors Hall Park development to the east of Corby has also led to a notable increase in local population between 2011 and 2021. Further increases in population should be expected as developments expand, and new locations come forward.

Population decline was observed in several rural areas such as north of Bedford and Luton. Smaller pockets of population decline can be found to the north of Wellingborough, south of Bedford and west of Leighton Buzzard. A reduction in population may make it more difficult for schemes to develop feasible economic cases without public operational investment.

Travel demand resulting from population growth can often lead to additional pressure on existing transport networks, leading to roads being more congested and public transport services being overcrowded and less reliable. Further development of the transport network should occur as an integral part of development planning and seek to ensure transport network capacity is available ahead of expected population growth. Innovation such as strategic mobility hubs and on-demand or shared mobility options can assist in making best use of able road and rail networks, with improved digital connectivity able to assist in reducing the number of less essential journeys.

Figure 4-2 Changes in Population[11]



[11] Source: Population change, ONS, 2021, https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/economicinactivity/datasets/dataonpopulationchangesandeconomicinactivitytrendsuk

Community Characteristics

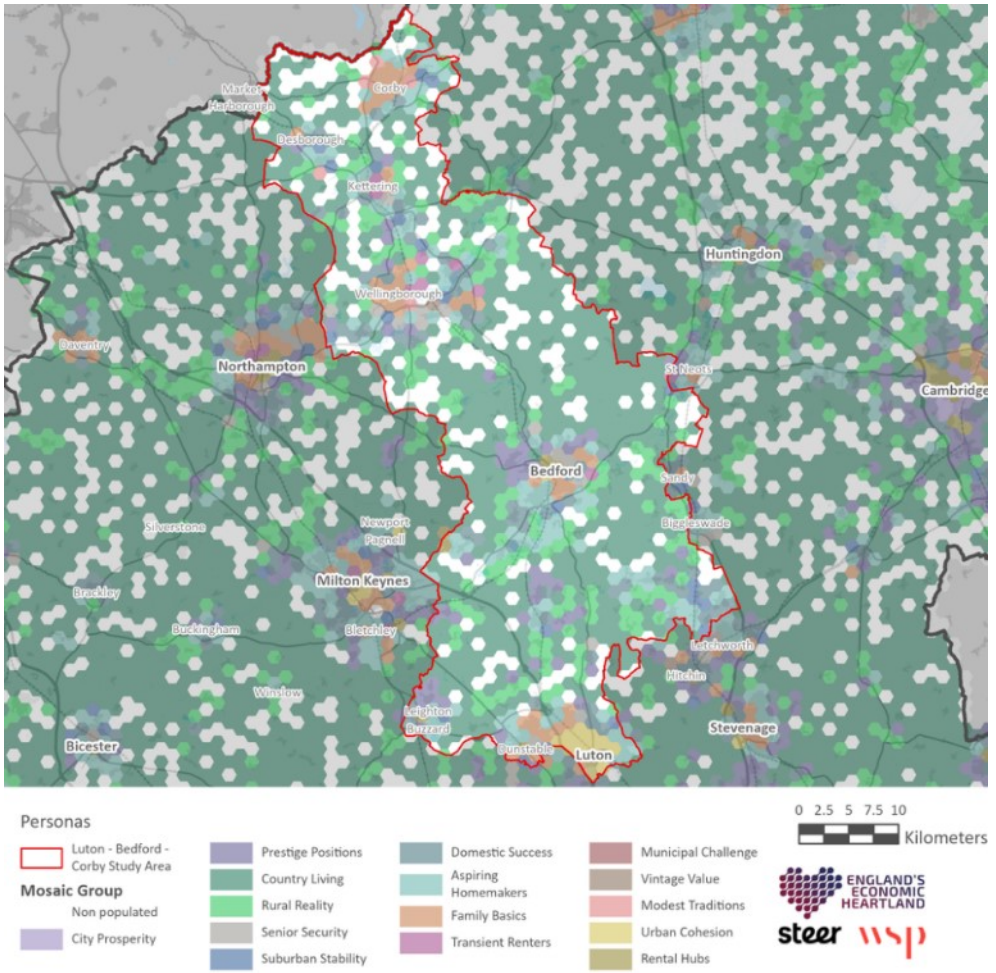
Types of Residents

All communities vary in terms of their socio-economic attributes. Experian's Mosaic data has been used to identify the dominant typology of people who live in the study area. The data segments the population into 15 broad persona groups (detailed in Appendix A). The persona groups provide valuable insights into how certain types of people may respond to different transport interventions. Urban centres in the study area including Bedford, Luton, Corby, Wellingborough, and Dunstable are typically characterised by *Urban Cohesion*, *Family Basics* and *Modest Traditions* population groupings. These groups tend to have lower levels of disposable income comparative to others, and members of these groups are likely to be younger adults.

Figure 4-3 shows that the outskirts of these major towns have relatively high levels of the *Prestige Position* population grouping, for example in the suburbs of Bedford. This group is typically characterised by higher incomes, living in high value homes with senior level professional occupations. This persona also typically has older children who still live at home. The rural parts of the study area are mainly dominated by the *Country Living* and *Rural Reality* population groupings which both typically have high levels of car dependency.

Community variability brings variable user needs. Younger populations in the Urban Cohesion groupings dominant in urban centres such as Luton may be more likely to use new shared mobility interventions which save time and money. Conversely, rural and relatively wealthy populations in the Country Living grouping in rural settlements such as Cranfield, have different needs, which may require different solutions.

Figure 4-3 Mosaic Data Personas[12]



[12] Source: Experian Mosaic, 2021, https://www.segmentationportal.com/Mosaic7/uk

Propensity to Travel (By Mode)

As a part of EEH's First Mile Last Mile Strategy a propensity framework (Table 4-1) was developed using the Experian Mosaic. Using this framework, key desirable characteristics of mobility were established for each persona group. A score of 1 indicates a low propensity to use a given mode of transport and a score of 5 indicates a high propensity.

For instance, those included in *Family Basics* place a high importance on cost and so are likely to have a higher propensity to take-up lower cost modes such as walking and cycling. Alternatively, individuals in areas characterised by *Prestige Positions* and *City Prosperity* tend to place a higher value on comfort and so have a lower propensity to cycle or use poorer quality bus services.

The propensity scoring is informed by the project teams' professional judgement and interpretation of the Experian Mosaic data at the time of writing this report.

The analysis suggests that different communities may have different propensities to take up certain forms of travel. For example, younger members of the *Urban Cohesion* group are typically more interested in new technologies and thus may be more inclined to use modern mobility solutions like E-scooters.

In terms of what this means for the study areas' most common make up of personas, the *Prestige Positions* concentrations would appear to be more receptive of light rail and mass transit schemes. The *Country Living* dominant persona is expected to be more receptive to ride sharing and cycling. In general, there is good propensity across the dominant groups for sustainable and active travel initiatives which provides opportunities for recommending and delivering such schemes going forward.

Table 4-1 WSP Experian Mosaic[13]

	Mode	City Prosperity	Prestige Positions	Country Living	Rural Reality	Senior Security	Suburban Stability	Domestic Success	Aspiring Homemakers	Family Basics	Transient Renters	Municipal Challenge	Vintage Value	Modest Traditions	Urban Cohesion	Rental Hubs
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
On foot	On foot	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Cycling	Cycling (SP & O)	3	4	5	4	4	5	4	5	5	4	4	4	4	4	4
	Cycling (P & O)	2	2	4	2	2	3	3	3	3	3	2	2	2	2	2
	Cycling (SP & S)	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
	Cycling (P & S)	2	2	3	4	2	2	3	2	2	2	2	2	3	2	2
E-Scooter* (kick-scooter)	E-Scooter (P & O)	2	3	4	4	3	4	3	4	4	3	3	3	2	2	3
	E-Scooter (P & S)	1	2	3	3	1	2	2	1	2	1	2	1	3	1	1
Motorcycle	Motorcycle (PTW - O)	2	1	1	1	1	3	2	3	3	2	2	1	1	2	2
	Motorcycle (PTW - S)	1	1	2	2	1	1	2	1	1	1	1	1	2	1	1
	Motorcycle (PTW - Taxi)	1	1	2	2	1	2	1	1	2	1	2	1	2	1	1
Car	Car (Sole Use)	5	3	1	1	3	3	2	3	3	3	3	3	1	4	3
	Car (Sole Use & S - P2P)	3	3	2	4	4	1	3	2	1	2	4	4	4	3	3
	Car (Sole Use & S - Ride Share)	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4
	Car (S - Car Club)	3	3	2	4	4	2	3	2	2	3	3	4	4	3	2
Traditional & Emerging Taxi	Traditional and Emerging Taxi	4	4	3	3	3	3	4	4	3	4	4	3	3	3	4
Ride-hailing (sole use)	Ride-Hailing (Sole Use)	3	2	1	1	2	2	2	2	2	3	3	2	1	3	3
Ride-hailing (shared use) – shared taxi	Ride Hailing (S - Taxi)	4	4	3	4	4	4	4	4	4	4	4	3	4	4	4
Ride-hailing (shared use) – DDRT	Ride Hailing (S - DDRT)	4	5	4	5	5	4	5	5	4	5	5	5	5	5	5
Traditional Bus	Traditional Bus	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1
Bus Rapid Transit	Bus Rapid Transit	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Very Light Rail	Very Light Rail	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Light Rail	Light Rail	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

[13] Source: Experian Mosaic, 2021, https://www.segmentationportal.com/Mosaic7/uk

Workplace Population

The workplace population of the study area in 2021 was approximately 476,800, about a quarter of the overall EEH workplace population of 2,669,000.

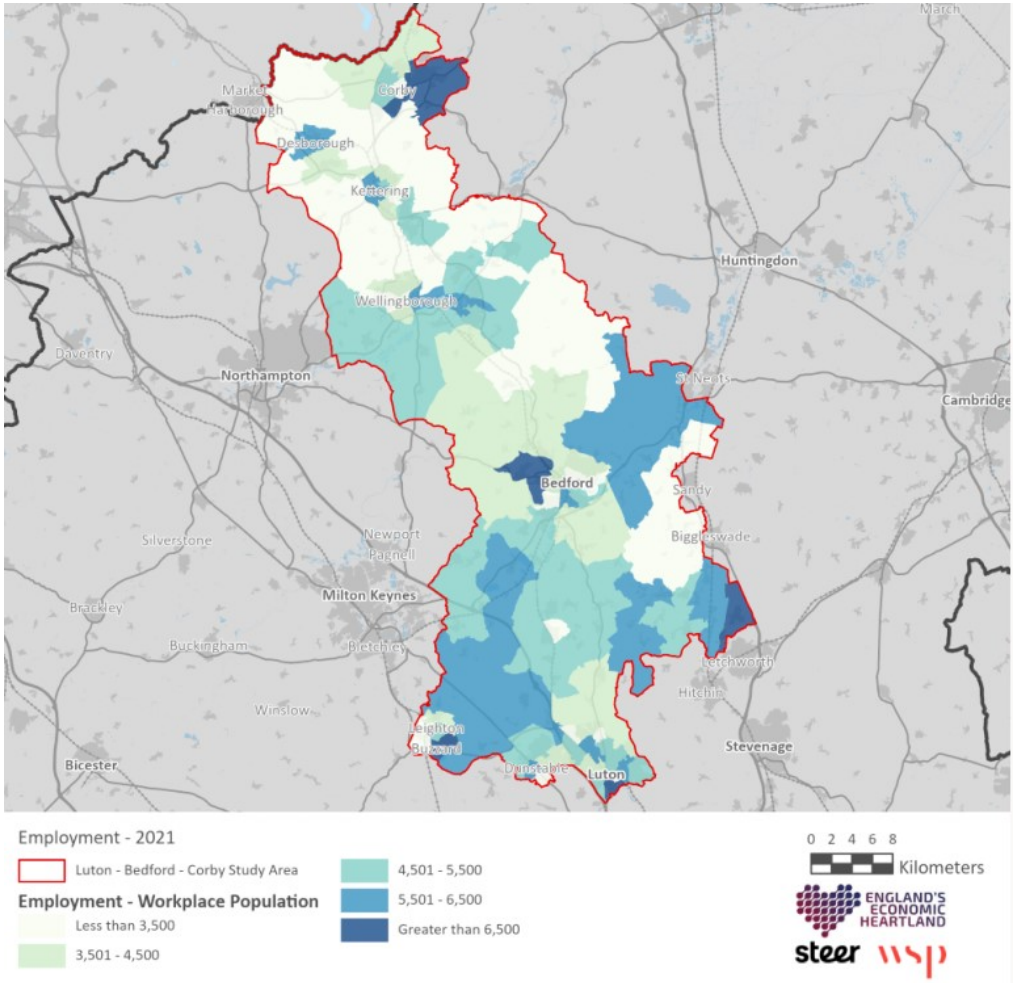
Figure 4-4 illustrates how the workplace population is concentrated around Luton (98,700 employees), Bedford (90,900 employees), and Corby (38,800 employees). High levels of employment are also observed within medium sized towns such as Leighton Buzzard (21,800 employees), and Stotfold (6,500 employees). These settlements all have large business parks and industrial estates, such as the Twinwoods Business Park northwest of Bedford.

In respect to employment for those living in the area, there is a large number of residents who are commuters to major employment destinations outside of the study area, notably London and Milton Keynes.

Jobs are predominantly located in urban centres such as Luton, Bedford, Corby, and Leighton Buzzard. 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 non-essential car trips to these centres of employment, interventions should focus on providing greater choice of travel options and therefore network resilience to and from key local employment destinations. Supporting this should be efforts to improve connectivity to regional strategic mobility hubs and railway stations which provide linkages to wider employment opportunities via public transport or active travel.

Figure 4-4 Employment Density[14]



[14] Source: People in work, ONS, 2021, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork

Average Earnings

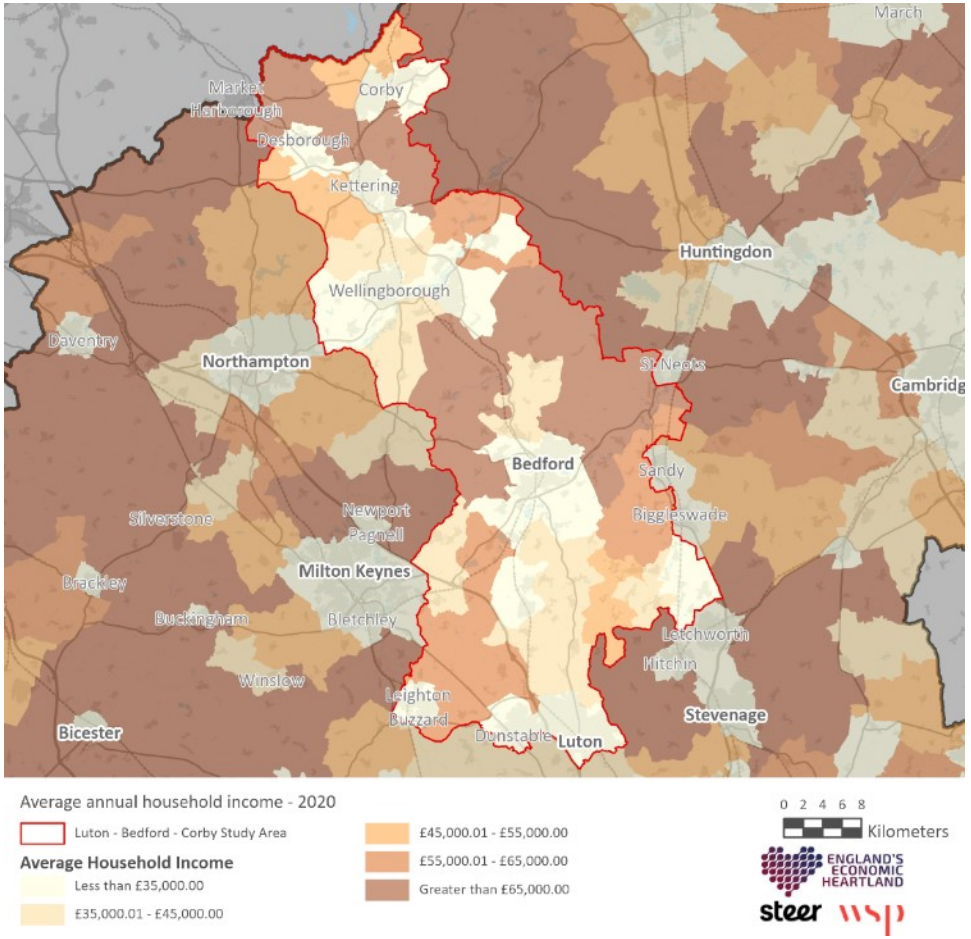
Figure 4-5 shows the variation in average earnings by household in 2020 when the average across the study area was £43,700. The highest average earnings were located to the north of Bedford and to the west of Leighton Buzzard. Urban areas including Wellingborough, Corby and Luton generally have lower average incomes than those of rural areas in the stud area.

This distribution can be seen to be the result of a range of factors, with the most notable that those in rural areas need to be able to afford higher transportation and relative living costs, and lower income households have less financial freedom and as a result can often be found in more deprived urban areas and or housing stock.

Note: average earnings will vary across any region, with this study needing to consider if and how it may impact current or future access to a range of transportation options.

While other factors may influence their choices and available modes will vary, a well-planned and operated transport network should present no or few barriers to households choosing to live in any particular part of the study area and still having accessible, inclusive, and affordable access to a wider range of employment education and skills opportunities

Figure 4-5 Average Earnings[15]



Relative deprivation and fuel poverty

The Indices of Multiple Deprivation (IMD) ranks Lower Super Output Areas (LSOAs) from least to most comparatively deprived based on factors such as

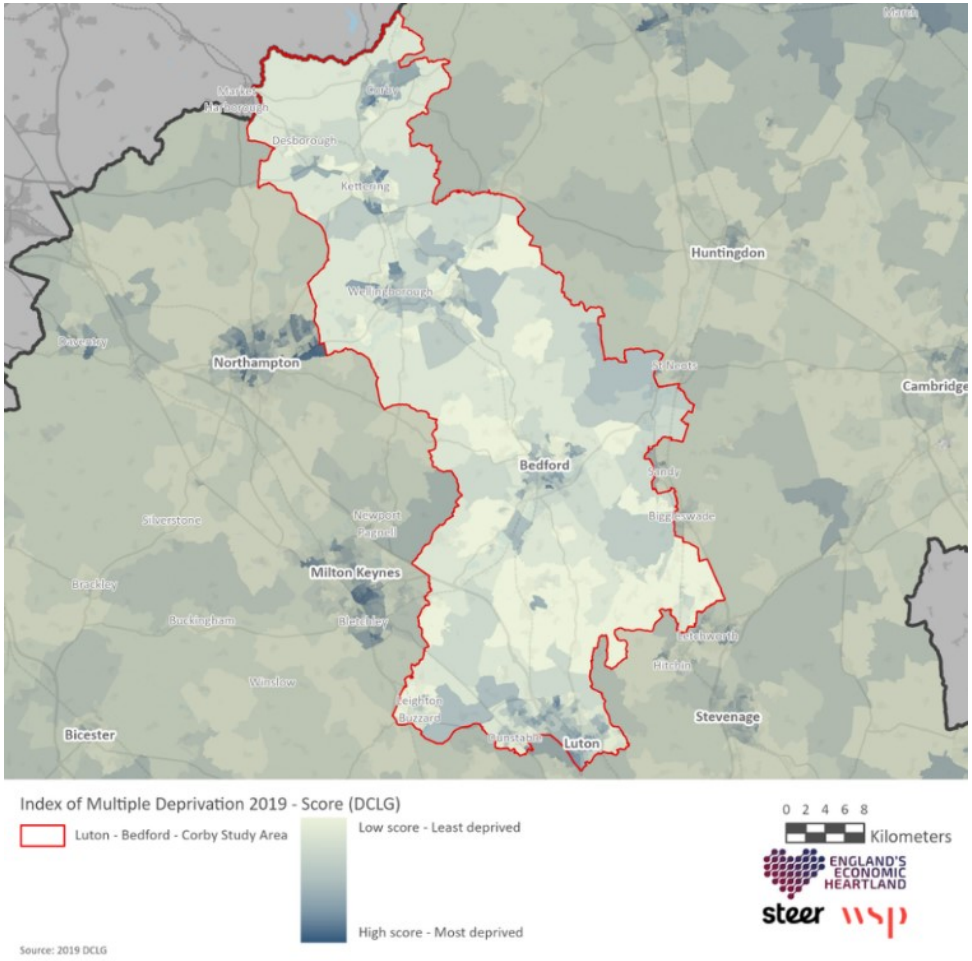
[15] Source: Income Estimates for small areas, FY2020, ONS, 2020

income, employment, education, health, and the living environment. Deciles are used to calculate relative deprivation levels by ranking the 32,844 LSOAs in England from most deprived to least deprived. Deprivation levels vary considerably across the EEH region, with Figure 4-6 showing the variation between rural and urban areas within the study area. Higher levels of relative deprivation area concentrated in the urban centres of Luton, Bedford, Kettering, and Corby, whilst rural areas such as those between Bedford and Luton experience lower levels of relative deprivation.

Fuel poverty is a comparable indicator and in England is based on the Low-Income Low Energy Efficiency (LILEE) indicator that considers a household to be "fuel poor" if the property has an energy efficiency rating of band D, E, F or G and its disposable income (income after housing costs and energy costs) is below poverty line. Based on the LILEE fuel poverty metric[16], 13.2% of households in England were classed as fuel poor in 2020 compared to 13.4% of households in the study area. The levels of fuel poverty vary within the study area, though Luton has the highest rate of fuel poverty (16% of households experiencing fuel poverty) and Leighton Buzzard has the lowest (10% of households).

Enhancing the active and public transport networks within the study area could support residents, workers, and visitors to access local and regional employment, education and health opportunities via inclusive and affordable travel options. In turn, this could support the levelling up agenda in deprived and fuel neighbourhoods across the study area.

Figure 4-6 Indices of Multiple Deprivation[17]



[16] Fuel poverty in England is measured using the Low-Income Low Energy Efficiency (LILEE) indicator, Dept for Energy Security & Net Zero: Fuel poverty statistics - GOV.UK (www.gov.uk)

[17] Source: English Indices of Deprivation, ONS, 2019, https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

Private vehicle dependency

Average car and van availability per household provides an indication of an area's reliance on private car-based travel, can act as one indicator of economic prosperity, and can often reflect the availability and quality of local public transport services and active travel infrastructure. In 2021, households in the study area had an average of 1.3 cars / vans per household with 31% of households having access to more than one car[18].

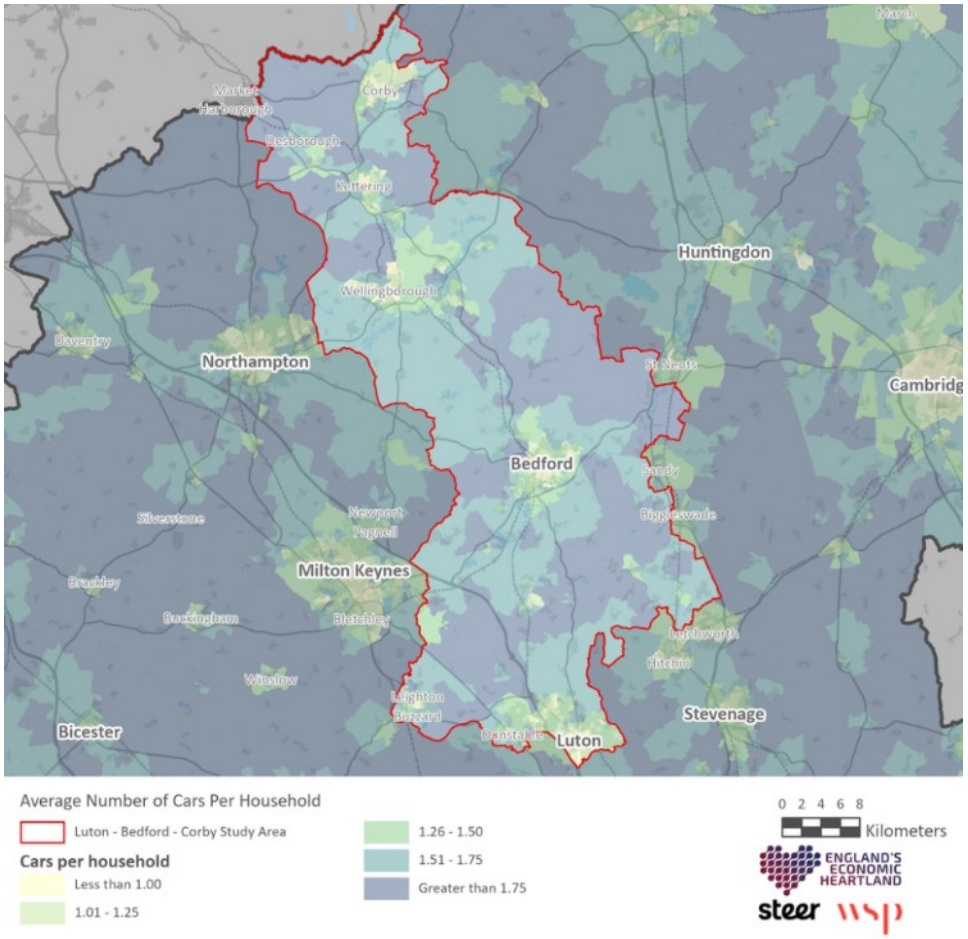
Figure 4-7 shows the distribution of cars/vans per household, with households outside of the key settlements more likely to have access to two or more, suggesting higher incomes and or dependency in these areas. The overlap with areas of higher incomes as shown in Figure 4-5 in particular should be noted.

Amongst the key settlements within the study area, car/van availability is lowest in Luton and Bedford, with an average of 12 car/van per household. Both of these areas have much higher densities of residents and jobs, as well as more substantial local and interurban public transport services.

Between 2011 to 2021 there was a small increase in the number of car / van per household across the study with this being slightly higher in urban areas such as Corby and Wellingborough.

High quality public transport networks have the potential to improve inter-settlement connectivity across strategic and local networks. Shared mobility schemes such as car sharing and car clubs should also be considered to improve mobility for areas with lower levels of car / van ownership and accessibility. Such improvements could help reduce the need for households to own multiple private vehicles and encourage the uptake of active and public transport.

Figure 4-7 Average number of cars per household[19]



[18] Source: Car or Van availability, ONS, 2021, Car or van availability - Office for National Statistics (ons.gov.uk)

[19] Source: Census QS416EW Car or Van Availability, ONS, 2021, https://www.ons.gov.uk/datasets/TS045/editions/2021/versions/1

Health & Disability Decile

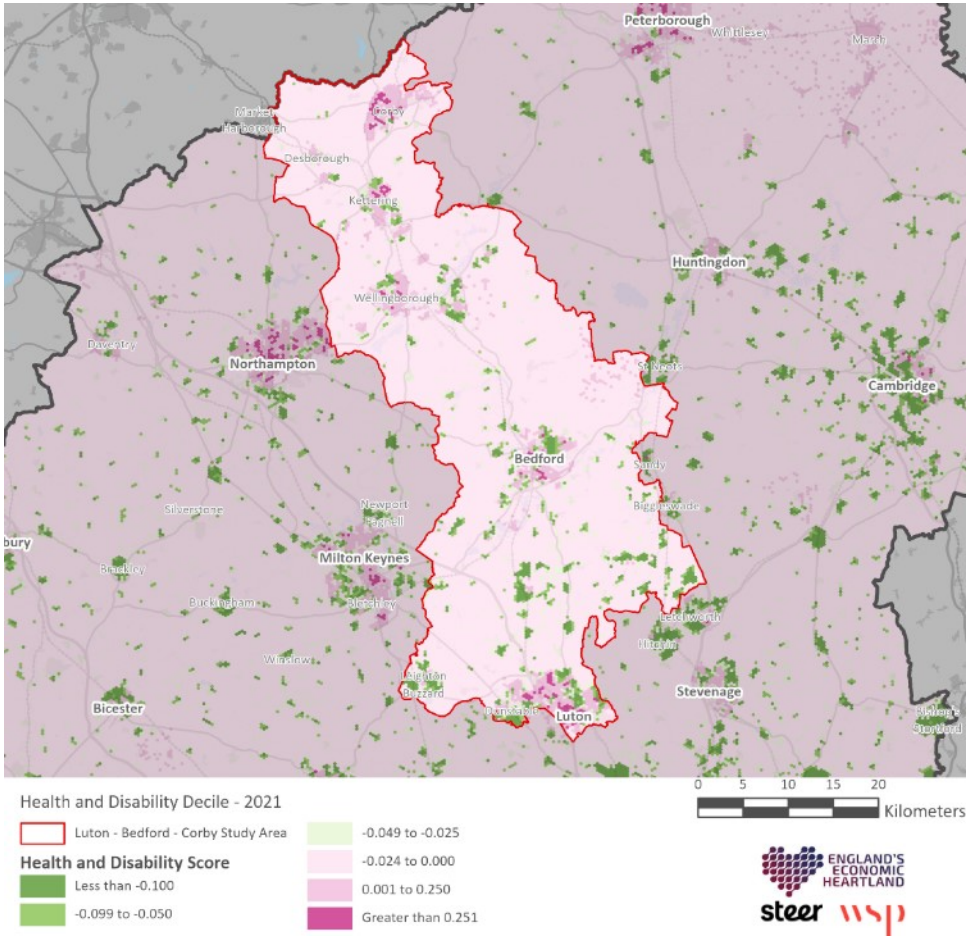
The UK is facing a health crisis due to growing levels of physical inactivity and poor air quality. The health and disability decile measures the relative risk of premature death and the impairment of quality of life through poor physical or mental health. This metric is based on four main indicators: years of potential life lost, comparative illness and disability ratio, acute morbidity and mood/anxiety disorders.

Figure 4-8Figure 4-8 shows that large parts of the study area have relatively low levels of health and disability deprivation. However, it also shows that Luton has relatively high levels of health and disability deprivation and that pockets of health and disability deprivation can be found in other urban areas such as south Bedford, Corby, north Kettering and Wellingborough

It is unclear to what extent this distribution is a result of areas directly contributing to poorer health outcomes compared such individuals moving there due to issues in other areas. For example, a wheelchair user will be less likely to live in an area without accessible pavements and public transport services. Further investigation of causes should be undertaken as part of more detailed work on any interventions.

Enhanced active travel and inclusive public transport provision could provide lower-cost and more sustainable mode alternatives for places where health deprivation is prevalent and could support an accessible and healthy transport network for all. There is also the opportunity to capitalise on growing health consciousness amongst already relatively healthy populations to promote active travel as a way to include healthy movement in day-to-day activities.

Figure 4-8 Health & Disability Decile[20]



[20] Source: Health & Disability Decile, ONS, 2021, https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/disability/articles/disabilitybyagesexanddeprivationenglandandwales/census2021

Road Safety

Figure **4-9** shows the location of Personal Injury Accidents (PIAs) recorded on the Strategic Road Network (SRN) and Major Road Network (MRN) between January 2017 and December 2021. This data captures reported incidents only and does not capture unreported incidents or perceptions of road safety. A total of 8,231 PIA's were recorded in the study area over the five-year period, with an annual average of 1,372 accidents. During the five-year period, 81% of accidents were recorded as slight, 17% were serious, and 2% were fatal.

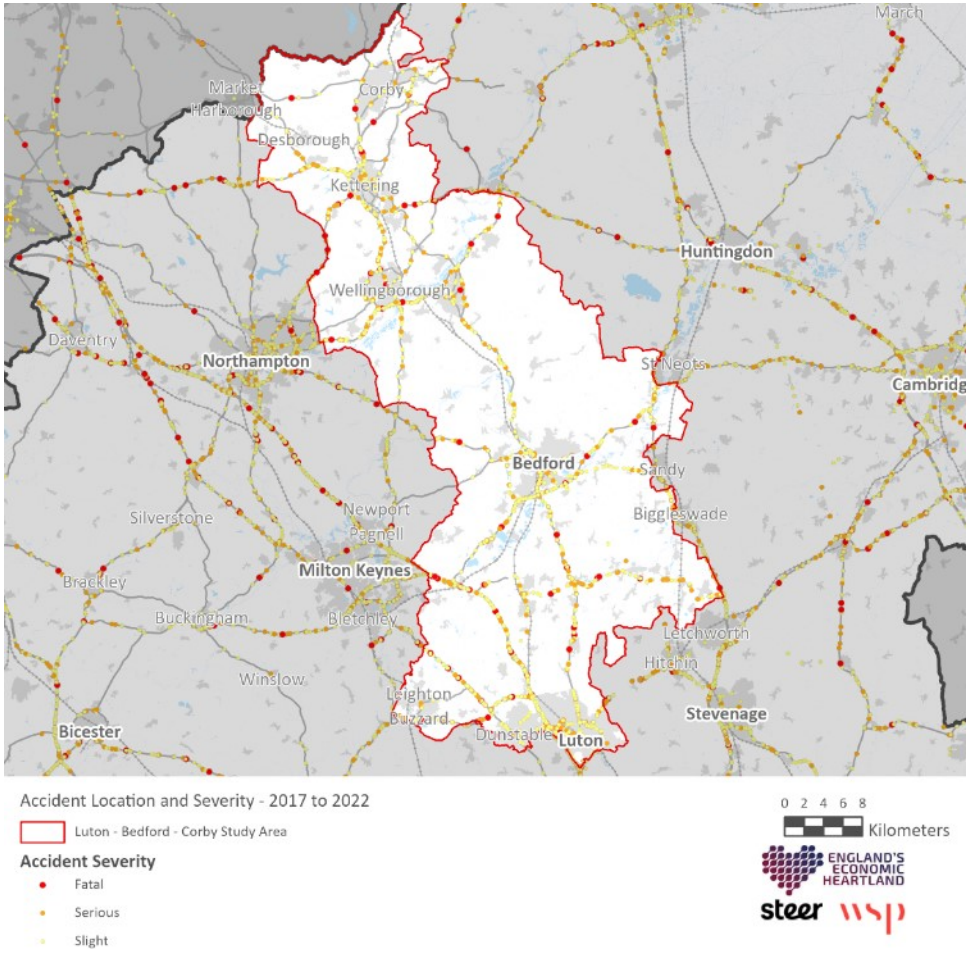
Figure 4-9 shows that accidents are concentrated around urban areas with higher volumes of traffic and interactions with pedestrians and cyclists. Similarly, accidents are less prominent on the rural road network where volumes are less although speeds are higher. The A6 from Luton –to Bedford has a high number of accidents, particularly between Barton-le-Clay and Wilstead, though as the A6 continues north towards Rushden fewer accidents occur, particularly compared to other sections of the study areas' SRN network.

Notable points of fatal accidents include:

- The A505 between Dunstable and Milton Keynes.
- The A6 between Luton and Bedford.

Numerous sections of the SRN have high concentrations of fatal and serious accidents, particularly between Luton and Bedford. Road safety should be adopted in infrastructure design, recognising that human error is not the singular cause of collisions. Exploring highway interventions such as traffic calming and visibility improvements could further support highway safety on the road network, and supporting the uptake of public transport and active travel on segregated routes could further reduce risk of road traffic collisions.

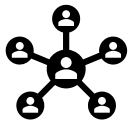
Figure 4-9 Accident Location & Severity[21]

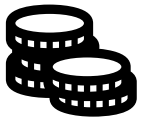


[21] Source: Road Safety Data, DfT, 2017 – 2021, https://www.data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

Summary People Issues and Opportunities

Table 4-2 Current Context – People: Summary

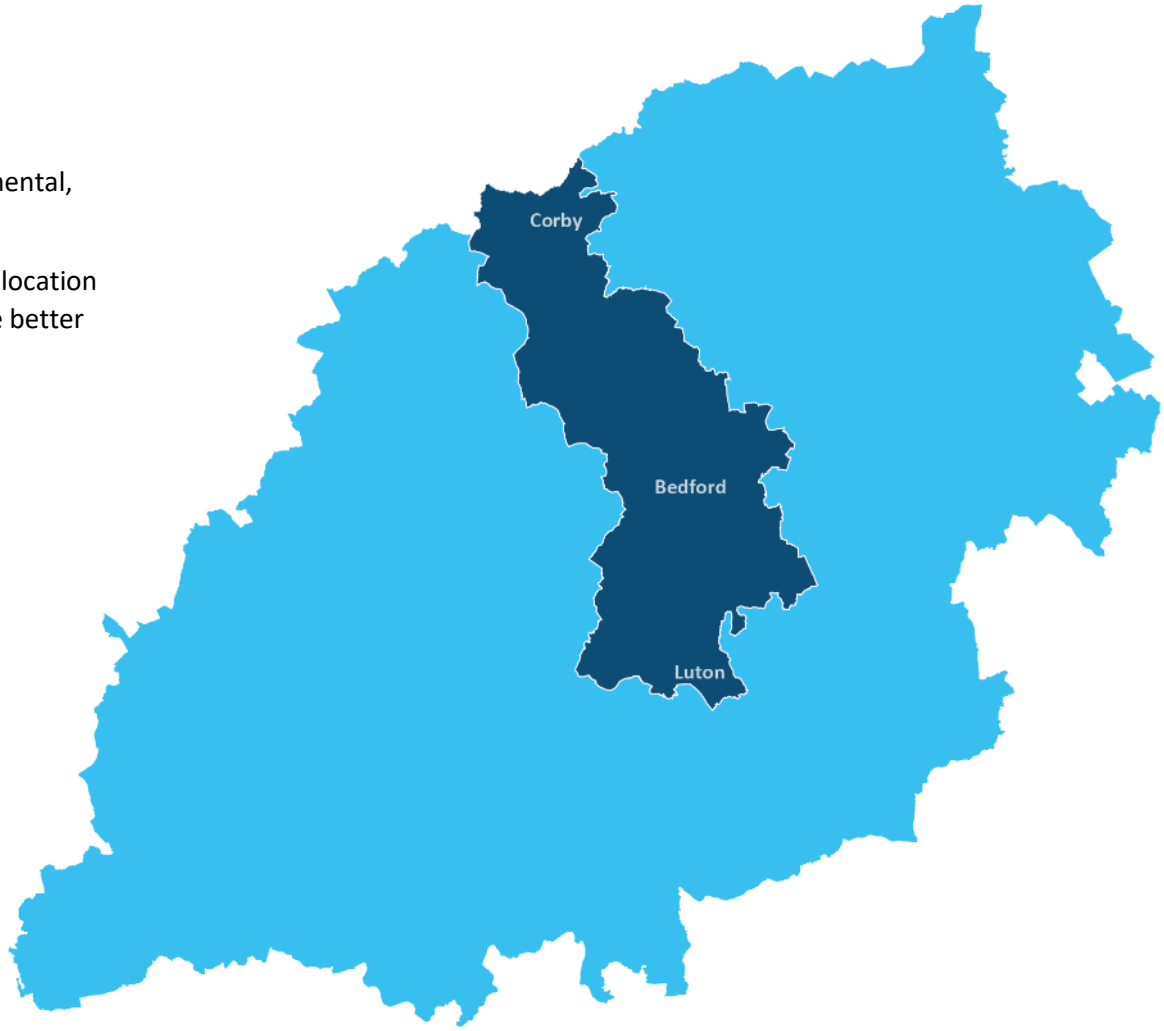
Theme	Issues	Opportunities
 **POPULATION**	**Sparse rural populations with high levels of car dependency** – 30% of the study area's population live in rural areas. Rural communities have complex travel and accessibility needs and so, sustainable mobility solutions which successfully lower car dependency in urban areas may not be as effective in rural settlements or on higher speed rural roads. The specific needs of these communities must be considered when assessing the potential feasibility of any future transport interventions.	**Key destinations available for new rural transport interventions** – New active travel, micromobility, and public transport solutions for rural areas could be developed to help connect the rural communities to strategic mobility hubs such as the rail stations of the Midland Main Line and East West Rail.
 **COMMUNITY**	**Social diversity requiring a wide range of interventions** – The study area includes a diverse range of community personas, each with different propensities to using mobility solutions. The personas range from 'Country Living', who dominate the rural areas of the study area, to 'Urban Cohesion' and 'Rental Hubs' who dominate the urban centres such as Luton. A 'one-size fits all' approach to transport is unlikely to be successful and the characteristics of the differing populations should be considered against potential transport interventions.	**Improving accessibility for all income groups** – There is an opportunity to implement packages of multi-modal transport interventions targeted to specific communities. For example, low-cost active travel solutions / infrastructure in urban centres could be explored to improve accessibility for lower-income groups. This could be most successful in urban areas such as Luton where trip generators and destinations are in closer proximity to one another, and lower-income groups are prevalent. The 'Urban Cohesion' persona that is prevalent in central Luton is typically expected to have an interest in new technology, and thus may be more open to take up technology driven solutions such as shared E-scooters.
 **EMPLOYMENT**	**Car dependant commuters** – There is a high proportion of commuters in the residential populations within the study area, such as those residing to the north of Desborough and to the north-east of Wellingborough. This can result in high levels of car use between home locations and major regional rail hubs (or for complete journeys to centres such as London) if no effective first mile/last mile options to stations are offered to residents.	**High income commuter groups with higher budgets for travel** – The average earnings in many parts of the study area is higher than the national average. This is particularly seen in areas north of Bedford. High income groups are more likely to take up 'high cost' solutions for decarbonisation, such as alternatively fuelled vehicles or non-traditional, high quality interurban public transport over traditional bus services. Accommodating such modes in strategic mobility hubs through electric vehicle charging and integrated ticketing will help to encourage such users to use bus or rail for all or part of their journeys even where they can afford to drive the full distance in a single or low occupancy vehicle.

Theme	Issues	Opportunities
 **DEPRIVATION**	**High levels of car dependency** – Car availability in the study area is high, particularly in rural areas on the western and eastern peripheries. High car availability often correlates with high car dependency, in turn leading to avoidable congestion, air quality issues and fuel poverty. To reduce car usage, it is vital to make more sustainable modes more attractive than the private car for factors such as time and cost.	**Better active travel and public transport connections between people, jobs and services** – Improved public transport connectivity will support access to employment opportunities, everyday services and facilities for lower income groups. As relative deprivation in the study area is seen more in the urban centres, affordable inter-urban connectivity is a key opportunity and affordable transport links to key employment hubs could further support the uptake of sustainable transport around the wider EEH region.
 **HEALTH & WELLBEING**	**Health deprivation is a potential barrier to active travel** – Key urban settlements within the study area have notable populations with health issues, with Luton, Corby, Bedford, Kettering, and Wellingborough having higher numbers of residents in relatively poor health. Poor health correlates with other factors such as income deprivation and poor air quality but may not be a direct result of the immediate living environment. Health deprivation may limit the accessibility of active modes to some population groups.	**Capitalising on populations who are conscious about living a healthy lifestyle** – There are relatively low levels of health and disability deprivation across most of the study area. Relatively healthy populations can have greater physical capacity to engage in active modes of travel, presenting an opportunity to capitalise on health consciousness amongst already healthy populations in areas such as Leighton Buzzard and Flitwick. **Public health benefits of active travel** – Intra-urban active travel connectivity, particularly between Luton and surrounding residential areas, could address high levels of health and disability deprivation by encouraging the use of walking and cycling for short and medium distance journeys.

5 Current Context (Place)

The place-based evidence provides an insight into the existing environmental, economic, and settlement characteristics of the study area.

By identifying existing environmental constraints and opportunities the location and scale of issues including air quality, safety and carbon emissions are better understood.



Environment

Carbon Equivalent Emissions

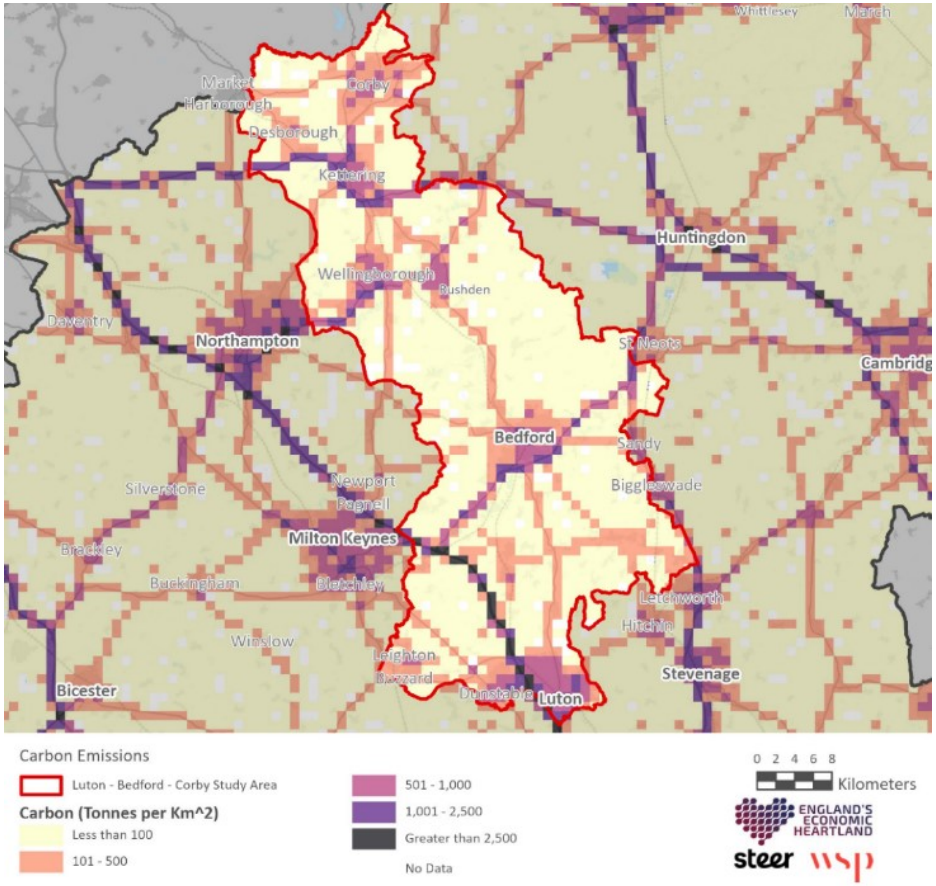
To avoid the serve impacts expected from human-induced climate change, the UK Government has set a legally binding target to reach net zero Green House Gas (GHG) emissions by 2050, with a reduction of 78% Against 1990 levels required by 2035. In 2021, the total amount of Carbon Dioxide equivalent (CO_2e) emissions (the common measure for GHG emissions) from road-based sources in those local authorities included in the study area was 1,881 KtCO2e, equating to 38% of all the road-based GHG emissions in the EEH region.[22]

Due in large part to the current mix of vehicles on the road network, including the high concentration of internal combustion engine vehicles, the highest levels of road-based emissions can be found along the M1 and radial A-roads through Luton, Bedford, Wellingborough, and Kettering (Figure 5-1). There are also comparatively high emissions close to rural settlements which could be attributed to relatively higher levels of car dependency in these environments. Interventions will also need to consider the large number of long-distance road journeys that start and or end outside of the study area or wider EEH region.

In Luton 8.6% of all transport emissions in 2019 were associated with "other sources", excluding road transport and diesel railways.[23] This is likely due in part to GHG emissions associated with London Luton Airport.

There is a need to find alternatives to network operations and vehicles that currently result in high transport-related emissions throughout the region. Electrification of road and rail vehicles will make a substantial contribution but needs to be supported through appropriate infrastructure and complemented with further mode shift to more sustainable and efficient travel options.

Figure 5-1 Carbon Equivalent GHG Emissions[24]



Flood Risk

Figure 5-2 illustrates that a small proportion of the study area falls within Flood Zone 2 (a 1 in a 1,000 years or greater annual probability of flooding) or Flood

[22] Source: LA and regional greenhouse gas data, DfES&NZ, 2005-2021
[23] Source: LA and regional greenhouse gas data, DfES&NZ, 2005-2021
[24] Source: National Air Quality Emissions dataset, 2020

Zone 3 (a 1 in 100 years or greater annual probability of flooding), particularly areas situated within close proximity to the River Great Ouse, River Ivel, and River Nene.

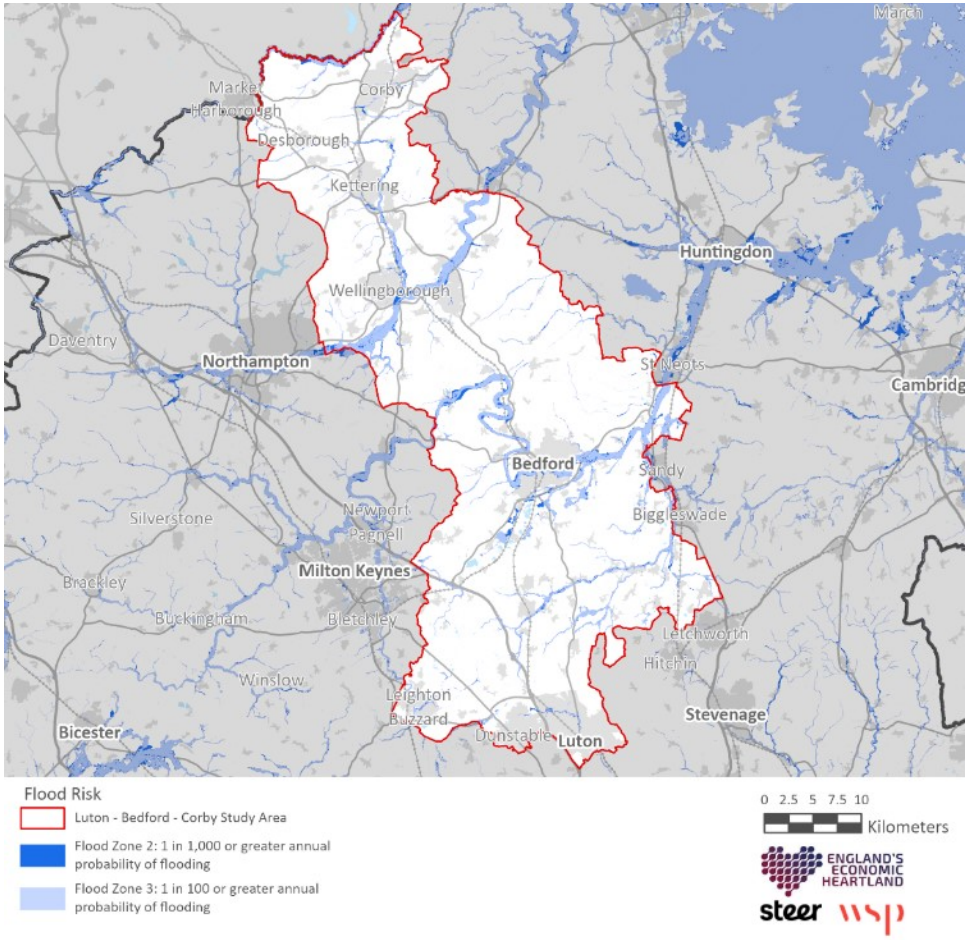
The areas within close proximity to the River Great Ouse are primarily located to the south, east and north of Bedford and are primarily concentrated within Flood Zone 3. A small proportion of flood susceptible land in these areas are within Flood Zone 2. Similarly, the River Ivel runs along the southeast of the study area, with land near the river primarily concentrated within both Flood Zone 3.

In the north, land to the south and northeast of Wellingborough is susceptible to flooding due to the proximity to the east-west routing River Nene. The land is predominantly categorised as Flood Zone 3, though the southeastern edge of Wellingborough is designated as Flood Zone 2.

Severe weather increases the threat of flooding, with a consensus in the scientific community that climate change will only increase the frequency and intensity of severe flooding events.

Land surrounding the River Great Ouse, River Ivel and the River Nene fall within designated Flood Zones. An awareness of the impact of climate change is needed to ensure interventions as well as existing road and rail infrastructure can be future proofed against severe weather events. Planned infrastructure will also need to reflect the requirements and latest science of flood defence and mitigation.

Figure 5-2 Flood Risk



Heritage

There are 162 Grade I listed buildings and 4,107 Grade II listed buildings within the study area as shown in Figure 5-3. There are no significant clusters of listed buildings in the study area, and most are situated in rural settings between Bedford and Wellingborough.

Ecology

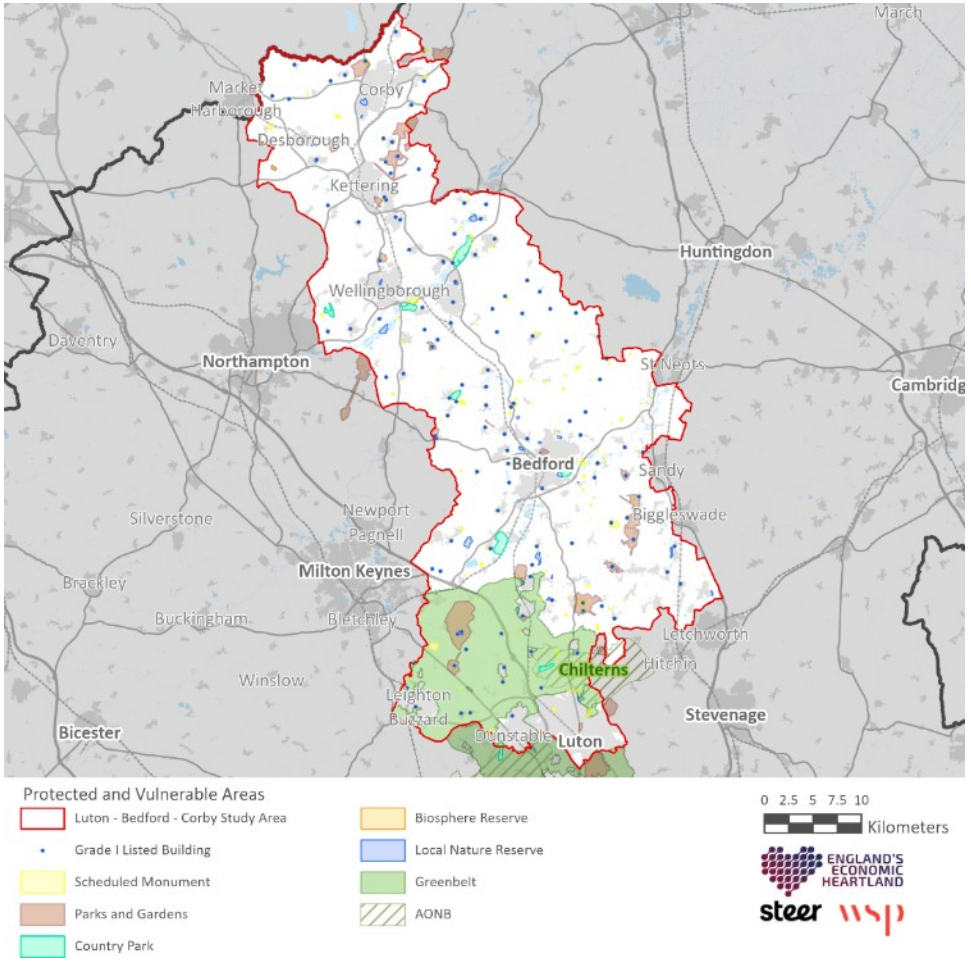
The Chilterns is an Area of Outstanding Natural Beauty (AONB) located to the south of the study area, spanning from Luton to Hitchin. There are numerous parks and gardens in the study area, including Woburn Safari Park, Woburn Abbey Deer Park, Wrest Park and Boughton House and Park. There are also country parks surrounding Wellingborough. Protection of these areas is important not only from a public amenity perspective but also from a local biodiversity viewpoint.

Green Belt

The south of the study area is encompassed within a green belt that spans between Milton Keynes, Leighton Buzzard, and Luton. This has a substantial influence on the location of planned growth in the southern part of the study area and is in place to assist the safeguarding of the countryside from encroachment and urban sprawl.

Protected areas and buildings can create challenges for implementing new transport solutions. Therefore, new infrastructure proposals will need to consider the existing ecological, historical, and environmental aspects of the study area to ensure minimal impact to the landscape.

Figure 5-3 Protected and Vulnerable Areas[25]



[25] Source: Protected and vulnerable areas, DEFRA, https://magic.defra.gov.uk/

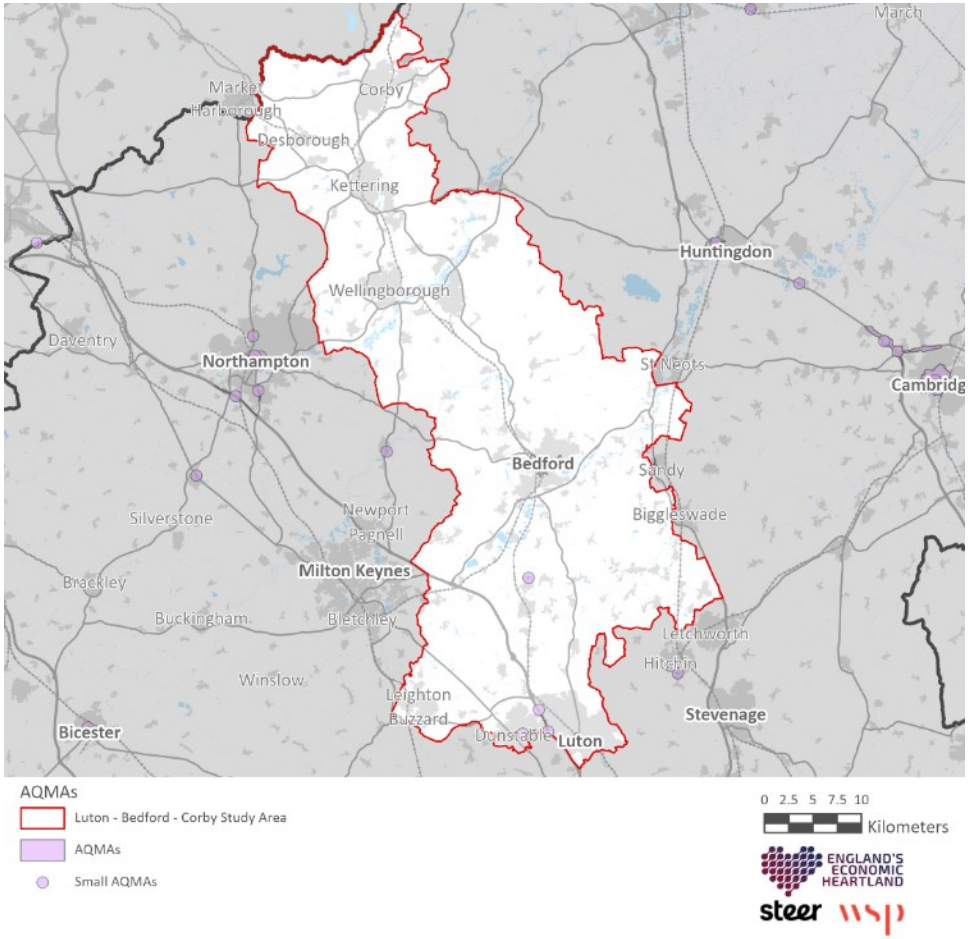
Air Quality

Figure 5-4 shows the location of Air Quality Management Area (AQMAs)[26] in the study area, which are typically located where large inter-urban corridors and strategic roads pass through urban areas and have been designated in the study area to focus on reducing excess levels of Nitrogen Dioxide (NO^2).

There is a total of five AQMAs within the study area, representing a total of 8% of the AQMAs within the EEH region. Smaller AQMAs within the study area are primarily concentrated to the south around Luton, with the largest located in the centre of Bedford.

The establishment of AQMAs highlights existing air quality issues in the south of the study area, particularly in Bedford and the areas surrounding Luton. Sustainable, low carbon transport schemes should be considered to improve air quality across the study area, particularly in existing AQMA areas.

Figure 5-4 Air Quality Management Areas[27]



[26] An AQMA is designated by DEFRA (2023)

[27] Source: AQMAs, DEFRA, 2023, https://uk-air.defra.gov.uk/aqma/

Economy

Housing Affordability

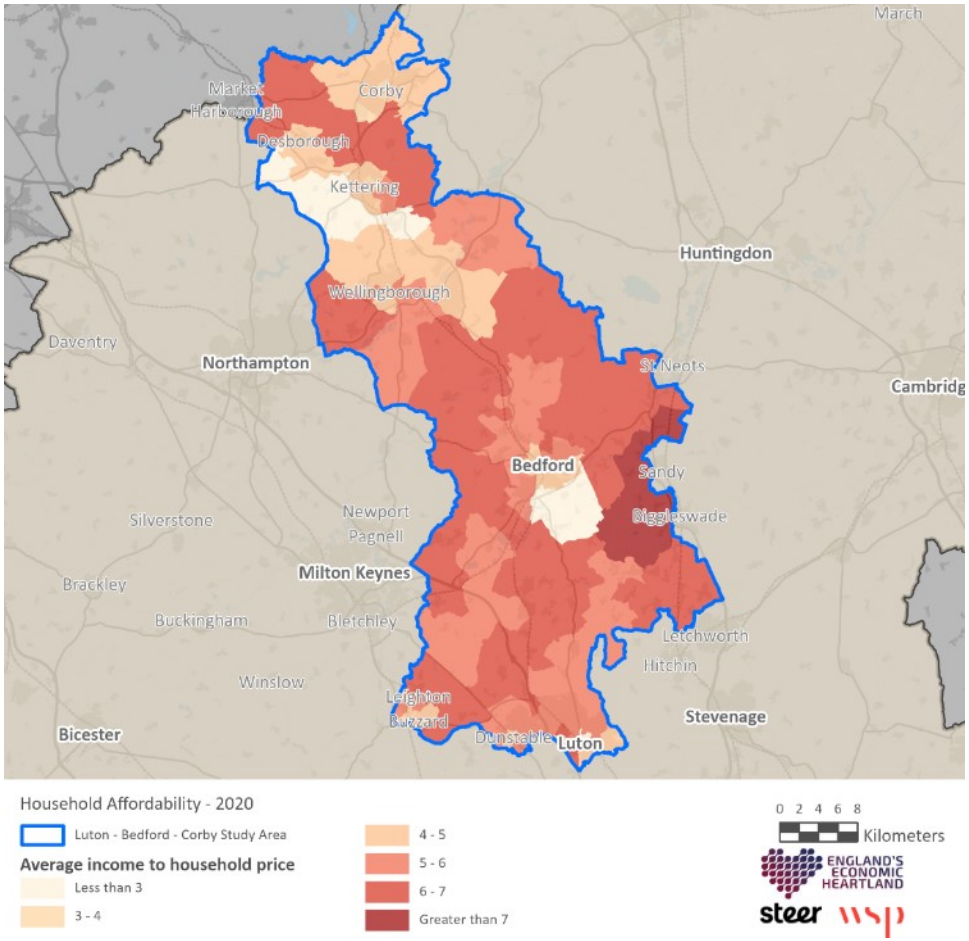
In 2020 the average house price in the study area was approximately £232,800 whilst the annual average household income was approximately £46,780. As a result, the study area had an affordability ratio of 5.0, the higher the ratio the less affordable the housing.

Figure 5-5 shows a slight north / south divide in household affordability within the study area, with higher affordability scores in the south and generally lower affordability scores to the north. However, the anomaly of south of Bedford (including the settlements of Wilstead and Wixams) should be noted as this scores significantly lower than other areas to the south of the study area and aligns more with the affordability of areas to the west of Kettering.

Key settlements to the north of the study area are generally more affordable compared to the south, such as Corby (with an affordability score of 4.3) and Kettering (with a score of 4.7). Households within the southern settlements are generally less affordable, with Luton, Bedford and Leighton Buzzard scoring highly with a ratio of 5.3 – 5.4.

Lower housing affordability in existing urban areas and or those with access to existing active travel routes and public transport services can result in higher prevalences of car-dependency as households move to less well services areas. Ensuring existing and planned development areas have adequacy active travel and public transport connections is therefore critical. Improving inter and intra-settlement public transport connectivity could also improve longer distance journeys for those living outside key settlements and in turn could contribute to easing housing pressures.

Figure 5-5 Housing Affordability[28]



[28] Source: House Price statistics for small areas (HPSSAs) – Dataset 2Median Price paid by MSOA (2020)

Industry Split

The EEH region is at the heart of UK's academic and commercial research sector. The region is characterised by a unique combination of scientific and cultural assets, resulting in a highly skilled workforce in the areas of innovation and technology. The industry split across the study area shown in Table 5-1 reflects this, as *business administration and support services* and *health* are the largest employers followed by *manufacturing* and *transport and storage*.

Business administration and support services and *health* provide more than one-quarter of the total jobs in the study area. This is likely attributed to the concentration of advanced manufacturing, life science, aviation, and aerospace businesses such as London Luton Airport, Nissan Technical Centre Europe Technologies and Unilever. Prominent industry hubs and business parks within the study area include:

- **Life sciences:** Unilever and Pharmaron on the outskirts of Wellingborough
- **Advanced Manufacturing:** Nissan Technical Centre Europe Technologies, Millbrook Proving Ground Ltd and RML Group
- **Aviation and Aerospace:** London Luton Airport, EasyJet and GKN Aerospace in Luton

To maximise the economic potential of key industries within the study area, interventions could focus on better connecting centres of employment with a skilled workforce (e.g. creating public transport or mass transit connections to settlements that lack rail line connections). There may also be opportunities to introduce more technology driven transport interventions to connect people with these industry sectors.

Table 5-1 Industry Sectors[29]

Industry	Study Area	EEH Region	England
	%	%	%
Agriculture, forestry and fishing	0.1%	0.1%	0.1%
Mining, quarrying and utilities	0.6%	1.0%	1.2%
Manufacturing	9.1%	7.4%	7.5%
Construction	5.4%	4.9%	4.8%
Motor trades	2.9%	2.0%	1.7%
Wholesale	5.7%	4.6%	3.7%
Retail	7.9%	8.7%	9.1%
Transport and storage	8.8%	5.8%	5.2%
Accommodation and food services	6.9%	6.0%	7.5%
Information and communication	2.1%	4.8%	4.7%
Financial and insurance	1.0%	2.3%	3.7%
Property	2.5%	1.7%	1.8%
Professional, scientific and technical activities	6.3%	10.4%	9.3%
Business administration and support services	14.8%	12.2%	9.0%
Public administration and defence	3.5%	2.8%	4.3%
Education	8.0%	10.0%	8.8%
Health	11.3%	11.1%	13.4%
Arts, entertainment, recreation and other services	3.1%	4.1%	4.3%
TOTAL	***100%***	***100%***	***100%***

[29] Source: Business Register and Employment Survey, ONS, 2020, https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey

Gross Value Added

The Gross Value Added (GVA) is a measure of the value of goods and services produced in an area, industry or sector of the economy. Table 5-2Table 5-2 shows the GVA (£ million) split for each industry as of 2021. The study area has a GVA of almost £22.5 billion, contributing 14.7% of the EEH region's total Gross Value Added in 2021.

Table 5-2 shows that in 2021 the highest contributions to GVA were Manufacturing (15.8%), Real Estate Activities (14.4%) and Wholesale and retail trade; repair of motor vehicles (13.2%) with all three industries having larger average contributions to the study area than the EEH average. The significant presence of advanced manufacturing businesses indicates the notable contributions of manufacturing within the study area.

Education, human health and social work activities, business administration & support services and are also key sectors that contribute between 7% to 10% towards the total GVA in the study area. Another notable GVA contributor is the transport and storage industry, contributing more than the EEH and England averages to the study area. This indicates the importance of Luton Airport and the Midlands Main Line, whilst also highlighting the large economic benefits of a study area containing some key strategic highway links, notably a north-south spine.

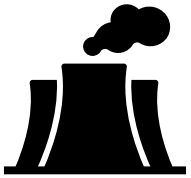
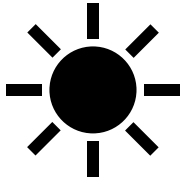
It is important that transport services and infrastructure support the continued growth and expansion of sectors such as manufacturing and wholesale / retail trade, that play a key role in contributing to the success of the EEH region. As manufacturing is an important industry in the study area, there could be opportunities to provide decarbonised freight solutions in this industry.

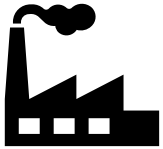
Table 5-2 GVA by Industry[30]

Industry	Study Area		EEH Region		England	
	GVA (£million)	%	GVA (£million)	%	GVA (£million)	%
Agriculture, mining, electricity, gas, water and waste	193	0.9%	1,288	0.8%	19,248	1.0%
Manufacturing	3,543	15.8%	18,432	12.1%	199,847	10.2%
Construction	1,724	7.7%	11,508	7.5%	120,939	6.2%
Wholesale and retail trade; repair of motor vehicles	2,968	13.2%	18,896	12.4%	215,520	11.0%
Transport & storage	1,188	5.3%	4,877	3.2%	63,465	3.2%
Accommodation & food services	560	2.5%	3,213	2.1%	48,678	2.5%
Information & communication	549	2.4%	8,801	5.8%	133,490	6.8%
Financial & insurance	205	0.9%	7,856	5.1%	182,024	9.3%
Real estate activities	3,224	14.4%	19,907	13.0%	256,710	13.1%
Professional, scientific & technical Activities	1,228	5.5%	12,958	8.5%	157,270	8.0%
Business administration & support services	1,743	7.8%	9,806	6.4%	105,175	5.4%
Public administration & defence	1,045	4.7%	6,521	4.3%	104,724	5.3%
Education	1,841	8.2%	11,978	7.8%	128,789	6.6%
Human health and social work activities	1,838	8.2%	11,476	7.5%	171,326	8.7%
Arts, entertainment & recreation	204	0.9%	2,560	1.7%	27,436	1.4%
Other service activities	343	1.5%	2,353	1.5%	28,071	1.4%
Activities of Households	56	0.2%	309	0.2%	3,011	0.2%
TOTAL	22,452	100%	152,739	100%	1,965,723	100%

[30] Source: GVA (balanced) by industry: local authorities by ITL1 region, ONS, 2021

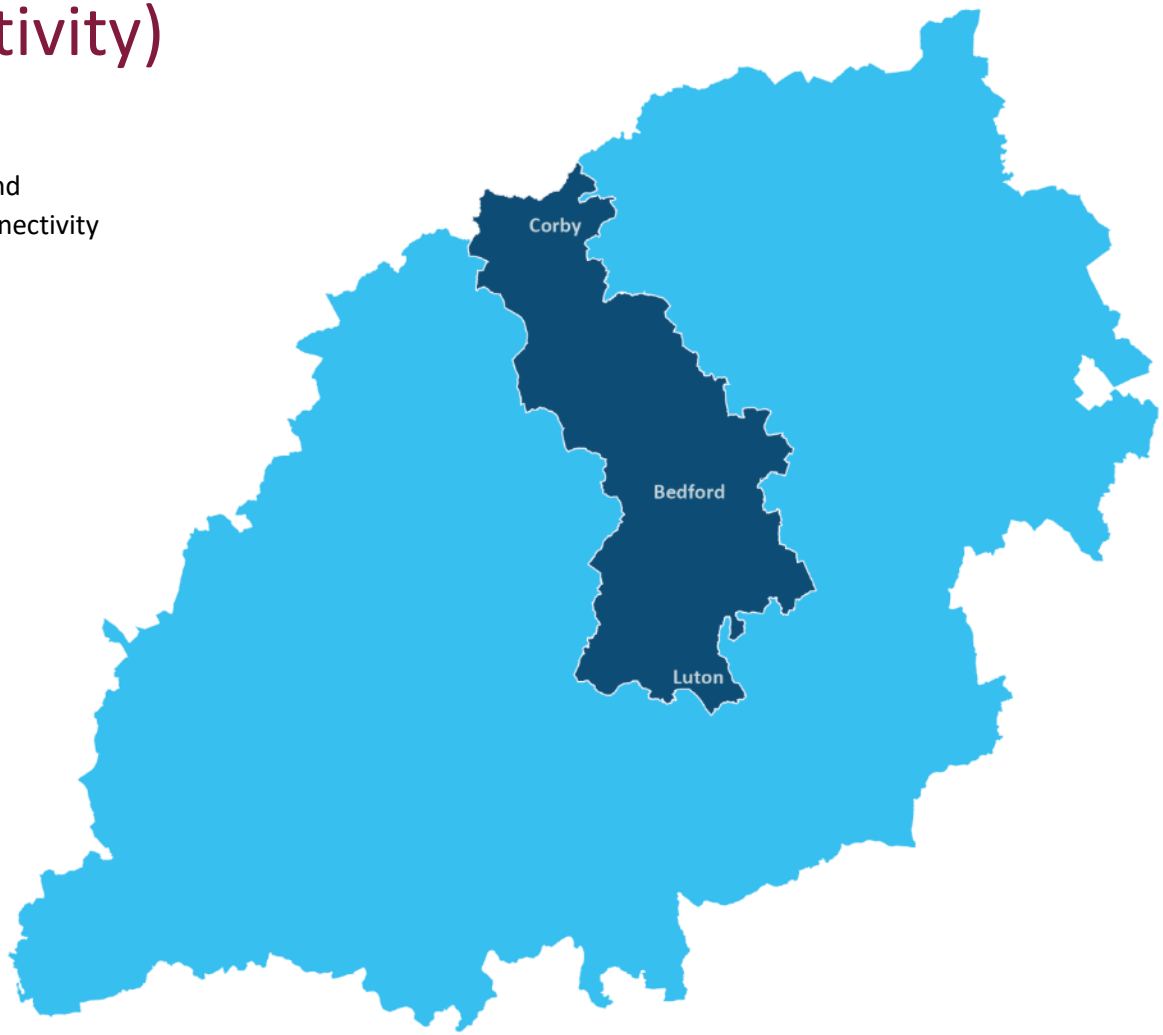
Table 5-3 Current Context – Place: Summary

Theme	Issues	Opportunities
 **Air Quality**	**Emissions from through traffic which the EEH have little influence over** – Much of the traffic in the study area is through traffic travelling on the major road network between origins and destinations which lie outside of the study area. This is a result of the study area containing key national road connections between London and the north of England / Scotland. This is an issue as EEH is likely to have less influence on these trips than if they were to either start or end within the area, however it can support the use of lower emissions vehicles through investment in interventions such as increased electric vehicle charging and development of strategic mobility hubs. The M1 is a notable source of road-based carbon emissions. **Emissions from Luton Airport** – In Luton, 8.6% of all transport carbon emissions are associated with "other sources", likely attributed to Luton Airport. The balance between the economic importance of the airport and local air quality concerns remains a challenge.	**Opportunity to decarbonise through new mobility solutions** – To help improve air quality and decarbonise the transport network there are opportunities to implement new shared mobility solutions in urban areas (e.g. e-bikes, e-scooters etc.), particularly in locations where they could form the first or last part of a longer journey by bus or rail. This would be particularly useful in dormitory suburbs with high levels of out commuting, such as Dunstable, Rushden and Bedford. In rural areas there are opportunities to explore demand responsive services, car clubs and car sharing schemes and across the study area there are opportunities to explore the rollout of electric vehicle charge points. **Luton Airport** – Although it may be difficult to reduce aviation related emissions from Luton Airport, the use of sustainable travel instead of private car can reduce surface transport emissions resulting from the airport and in turn reduce the airport's overall environmental footprint. **Electrification** – Provision of overhead electric cables to help enable electric powered trains along the Midland Main Line and East-West Rail could create an alternative to private car travel and decarbonise the rail sector for the EEH region.
 **Climate Change and Protected Areas**	**Increased flooding risks could lead to infrastructure damage** – The parts of the study area which surround the River Great Ouse. River Ivel and the River Nene fall within designated Flood Zones. An awareness of the impact of climate change is needed to ensure any proposed interventions are future proofed from severe weather events. **Protected Areas** – The presence of the green belt in the south of the study area and the numerous country parks may pose a challenge to any proposed developments and transport infrastructure. New large scale transport schemes will need to avoid conflicts with protected areas to help reduce risks of biodiversity loss.	**Active travel greenways in Protected areas** – With the greenbelt surrounding London and numerous protected areas influencing the spatial distribution of new housing and employment growth in the area, there are opportunities to link new settlements via attractive mass transit system and cycling 'greenways'. This would assist in the decarbonisation of the transport system within the study area.

Theme	Issues	Opportunities
 **Built Environment**	**Manufacturing Industry Demand** – As manufacturing is one of the key employment sectors in the study area and one of the highest contributors to its economic prowess, a large demand for transport services for material deliveries is required. This is likely to contribute to the study area's carbon emissions due to the use of traditionally fuelled HGV vehicles.	**Sustainable freight solutions** – The use of electrified rail freight or zero emission HGVs could offer a sustainable solution to help fuel the local industries of the study area. This could help reduce carbon emissions within the study area.

6 Current Context (Connectivity)

The connectivity evidence presents a set of transport network, modal and movement data to gain an insight into the current pattern of travel, connectivity challenges and opportunities within the study area.



Digital Connectivity

In the digital connectivity arena, the pace of technological development has led to order-of-magnitude changes in broadband speeds and usage over the course of the last few years. Substantial improvements in fixed and mobile connectivity are being driven by a combination of commercial rollouts and policy action.

In terms of fixed broadband, the coverage of superfast services (offering 30Mbps+ download speeds) is now nearly ubiquitous across the UK. The focus has shifted to the roll-out of gigabit-capable services offering 1,000 Mbps+ download speeds.

The largest players in this are BT Openreach who are rolling out Fibre-to-the-Premises (FTTP) services, and Virgin Media who are upgrading its existing cable network to gigabit-capable DOCSIS 3.1 technology and using FTTP to extend its footprint. In addition, there has been an increase in the number of independent fibre network operators over the last few years. In EEH these include: CityFibre, Gigaclear, Tove Valley Broadband, Glide, and Hyperoptic.

Recognising that commercial rollouts are likely to leave harder-to-reach premises unable to access gigabit services, the Government has established the £5 billion Project Gigabit which maps to subsidise coverage for the 'final 20%' of premises: with the project's initial procurements for subsidised rollouts already getting underway. The EEH area will be addressed through five separate Regional Supplier procurement lots. The Government's aim is to achieve gigabit coverage for 85% of UK premises by 2025 and to push towards 100% nationwide coverage as soon as possible.

For mobile connectivity, the UK's four mobile network operators are currently rolling out 5G services, which offer higher speeds and lower latency, and are expected to have a variety of applications from health care to agriculture to advanced manufacturing. It is uncertain how far these commercial rollouts will extend, but EE has recently stated that it expects their 5G services to cover 90% of the UK landmass by 2028. In parallel, the publicly subsidised £1 billion Shared Rural Network initiative between the Government and the mobile operators is seeking to address areas of the UK where 4G coverage is limited.

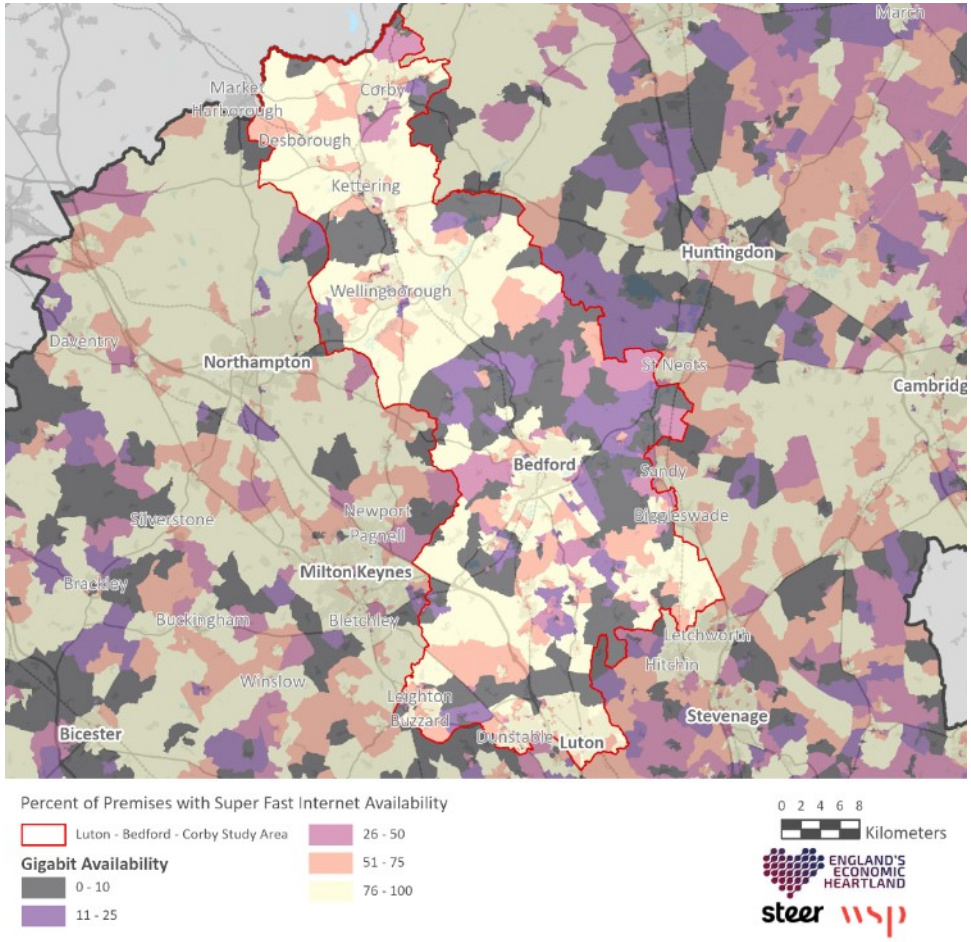
Gigabit Connectivity Coverage

Figure 6-1 highlights the proportion of households in each of the LSOAs within the study area that have access to gigabit internet. Figure 6-7 shows an urban / rural divide in access to gigabit internet speeds, with larger key settlements such as Luton, Bedford, Wellingborough and Kettering having a higher proportion of gigabit availability. Rural settlements such as Milton Ernest, Blestoe and Cardington have lower coverage.

Access to high-speed internet connections is crucial in enabling remote access to services and workplaces. EEH's "Working from Home Propensity and Capacity Release report" (July 2021) estimates that if those who used to commute by car and who (as a result of the COVID-19 pandemic) started to work from home were to continue to do so for two days per week, then there is the potential for between 10% to 12% of peak hour traffic to be removed. Hybrid working can help to reduce the need for travel at peak times and in turn reduce carbon emissions and traffic congestion on the highway network.

Improved digital connectivity, particularly in rural areas, could help facilitate ongoing adoption of agile and hybrid working practices and in turn reduce unnecessary private vehicle journeys and associated road congestion. If those living in rural areas, who usually commute via car, have the capacity to adopt a hybrid working pattern, the number of trips undertaken by car could reduce and in turn reduce peak hour traffic.

Figure 6-1 Internet Availability[31]



[31] Source: Connected Nations Report Performance Data, OFCOM, 2023

Active Travel Network

Active travel (walking, wheeling, and cycling) represents a notable opportunity for shorter journeys and or the 'first and last mile' of longer distance journeys. Particularly within urban conurbations and where there are established routes, active travel journeys can assist in tackling road congestion and public transport overcrowding, avoiding carbon emissions and boosting health and wellbeing.

The distribution of active travel infrastructure throughout the study area varies and across the Sustrans National Cycle Network. There is a mix of on-carriageway, segregated and shared-use sections and as such their usability may be limited for unconfident cyclists. Figure 6-2 illustrates the distribution of strategic active travel infrastructure throughout the study area. Sustrans National Cycle Routes (NCN) and National Trails that are contained within or pass through the study area.

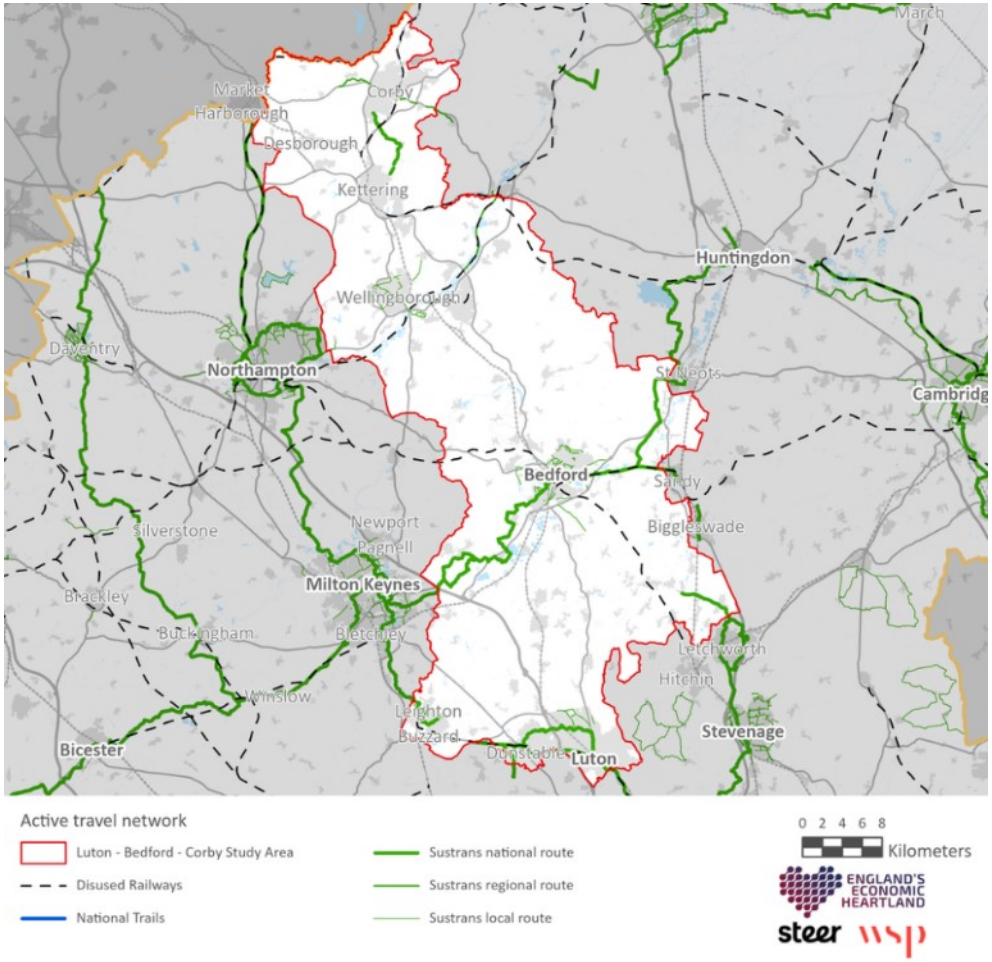
These routes provide strategic connectivity between settlements on foot and cycle and comprise of a mix of on-carriageway, segregated and shared-use sections. Several urban settlements are connected by Sustrans NCN routes. This includes connections between Milton Keynes, Luton, Leighton Buzzard (Via route 6) and Bedford (Via route 51).

Several medium size settlements are poorly connected by active travel routes, notably Wellingborough and surrounding settlements. This could limit opportunities for users to undertake medium and long-distance trips by cycle or other micro-mobility modes (e.g. e-bikes).

The EEH Active Travel Strategy sets out a high-level ambition for active travel in the region. The document defines how to achieve excellence in active travel, seeking to create a clear policy direction for active travel and identify the missing links in the active travel network. Disused railway lines in the study area could support new inter-urban active travel routes from Bedford to Hitchin and Northampton to Wellingborough and Rushden.

To help facilitate longer-distance journeys by walking, wheeling, cycling and or riding it is important that active travel networks provide high quality local connections between public transport infrastructure, residential and employment areas. New active travel infrastructure between small and medium size settlements could help reduce the reliance upon private car and improve the sustainability of rural areas.

Figure 6-2 Active Travel Network[32]



Micro-Mobility

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.

Several shared micro-mobility schemes operate throughout the study area as set out in Figure 6-3. These schemes generally operate in large and medium size urban areas due to their commercially viability being better than in rural communities.

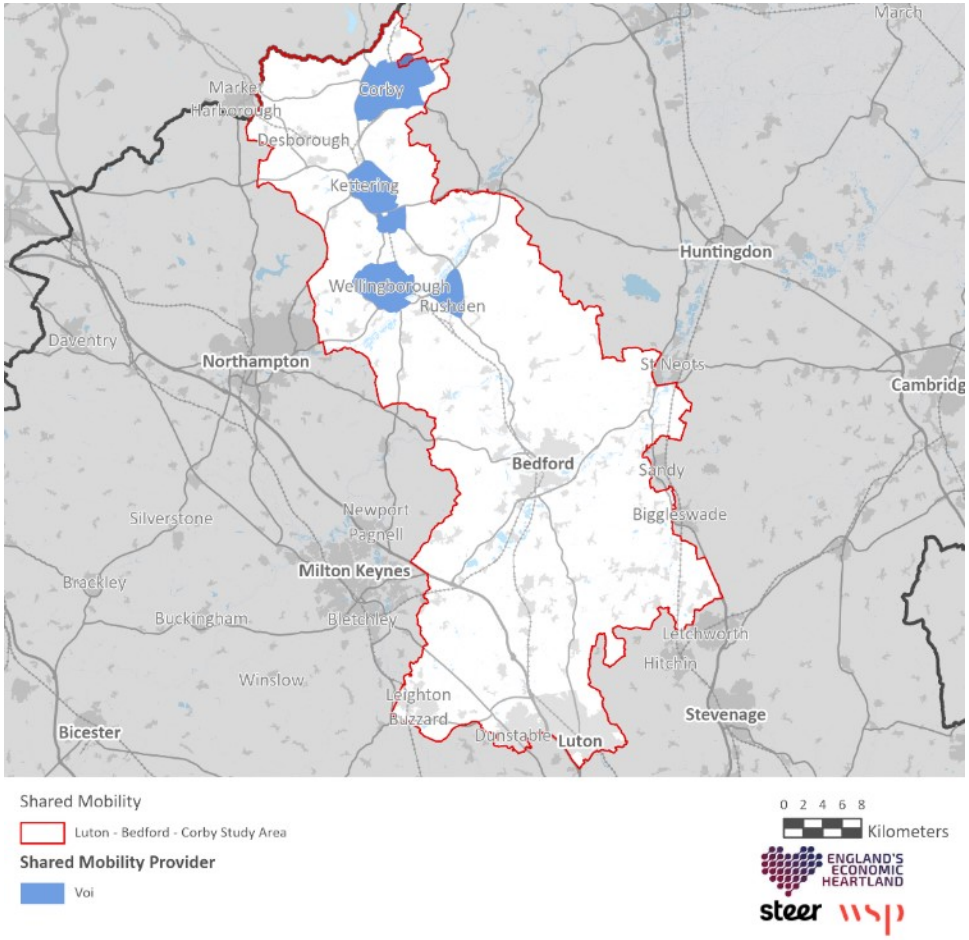
The existing micro-mobility schemes within the study area are located in the urban settlements of Corby, Kettering, Burton Latimer, Wellingborough and Rushden. Each location currently offers public e-scooter schemes operated by Voi.

The south of the study area lacks public micro-mobility, restricting the potential for mode-shift from private car travel for first / last mile journeys to public transport services.

Micro-mobility solutions can form the first / last mile of a longer distance journeys undertaken by public transport. They can also help to replace short and medium length journeys that would otherwise be undertaken by car. New shared mobility schemes could be considered in urban areas where no existing services are available, such as the southern half of the study area, to maximise mode shift.

[32] Source: Active Travel Network, Sustrans, https://data-sustrans-uk.opendata.arcgis.com/

Figure 6-3 Shared Mobility[33]



Cycling Propensity

There are numerous benefits of cycling, including improved health, reduced pollution and often, quicker journey times.

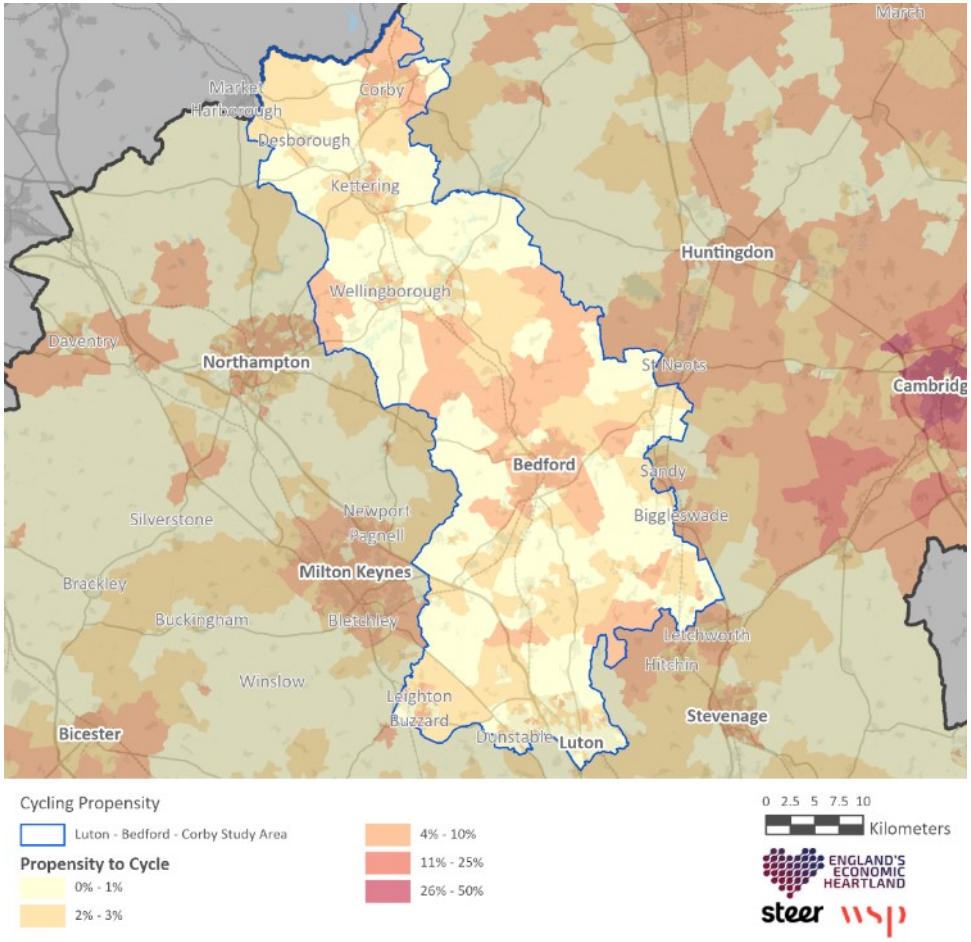
Figure 6-4 shows the percentage of journeys to work (JTW) currently undertaken by bicycle (as per the 2021 Census) to provide an insight into the existing levels of cycling within the study area. High proportions of the population cycling to work can be seen in dense urban centres, such as the centre of Bedford and Luton. Cycling to work is less common in rural areas, such as those north of Leighton Buzzard and southeast of Kettering. This is likely attributed to inadequate active travel infrastructure connecting these rural areas to key destinations.

The Cycling Propensity Toolkit (CPT) considers the cycling JTW mode share in several future scenarios where the population acquires a different propensity to travel. The CPT suggests that if the population of the study area acquired the same propensity to cycle as that of the Dutch population, the JTW cycle mode share across the study area would increase to 19%. The largest uptake in cycling could occur in urban centres with relatively high existing cycle modal share such as Luton, Bedford, Corby, Kettering, and Wellingborough.

The use of cycling to travel to work in the study area is low. Even if the population developed a higher propensity to cycle, high quality cycling infrastructure is needed to facilitate these trips. As such, high quality, Local Transport Note 1/20 design compliant, cycle infrastructure could encourage the uptake of cycling for commuting and other journey purposes. Settlements with high car usage and inadequate active travel infrastructure could then benefit from improved walking and cycle routes and increase their active travel mode share.

[33] Source: Zipp, Voi, Santander, Lime, Tier, Ginger, BikeSharingWorldMap, 2023

Figure 6-4 Travel to Work mode[34]



Public Transport

Rail Network

The rail network in the study area is shown in Figure 6-5, with the Midland Main Line (MML) one of the three main lines between London and the north of England. The MML connects London to Sheffield with several stations in the study area including Luton Airport Parkway, Luton, Leagrave, Harlington Flitwick, Bedford, Wellingborough, Kettering, and Corby.

The area also includes the Marston Vale Line (MVL) and its services between Bedford and Bletchley via several smaller stations along the route. This creates an effective car-free connection between the MML and the West Coast Mainline (WCML). Small sections of the WCML can be found at Leighton Buzzard and a small Section of the East Coast Main Line (ECML) can be found to the south and north of Biggleswade. The MVL is set to be upgraded as part of East West Rail Phase 2 to improve connections with WCML services to and from centres such as Birmingham, Northampton, Liverpool, and Glasgow.

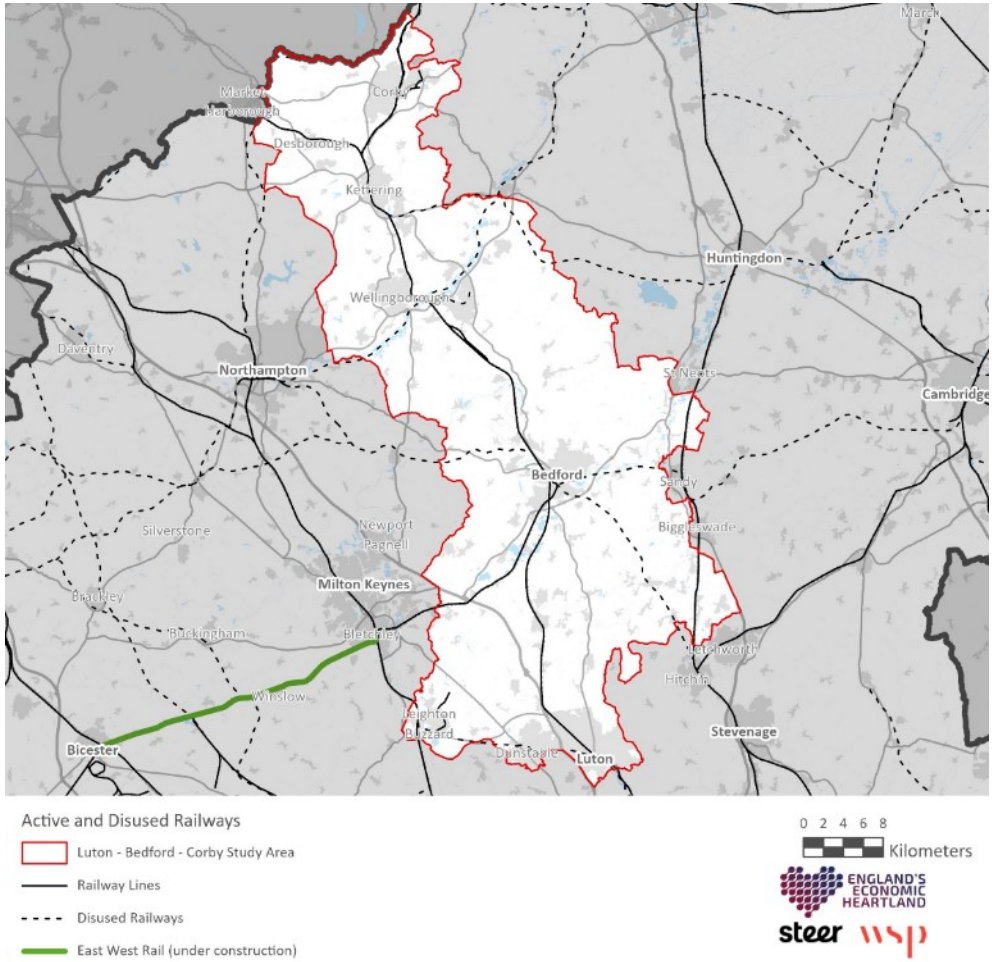
The Oakham – Corby line also operates within the study area and connects the MML to Corby, Oakham, and Melton Mowbray, though has only one service a day. There is currently no rail connection between the MML and East Coast Main Line (ECML) in the area, with those needing to connect with ECML stations and services typically needing travel into and out of London or use bus services, significantly increasing the travel times for rail journeys. Proposals for EWR Phase 3 are expected to create a new rail connection in the coming decades to and from centres such as Cambridge, Peterborough, Leeds, and Edinburgh.

[34] Source: Method of Travel to Work, ONS, 2021

Moving of high-speed services to HS2 is expected to help release some WCML capacity, providing an opportunity to improve services to places such as Watford Junction. The delivery of EWR (including its upgrade of the MVL) is forecast to improve rail access through the area and could help to reduce the dominance of private vehicles use and dependency between key settlements such as Milton Keynes, Beford, and Cambridge along the A421/A428 corridor.

To increase rail usage in the study area, effective interchange opportunities for east – west movements should be considered (beyond the benefits of East West Rail). To further encourage the uptake of rail, improved local connectivity and increased service frequencies, particularly between Corby and more northern stations, could be explored. Improvements could be achieved via new mass rapid transit solutions or new railway lines.

Figure 6-5 Active and Disused Railways[35]



[35] Source: Open Street Map, https://www.openstreetmap.org/

Rail Station Usage

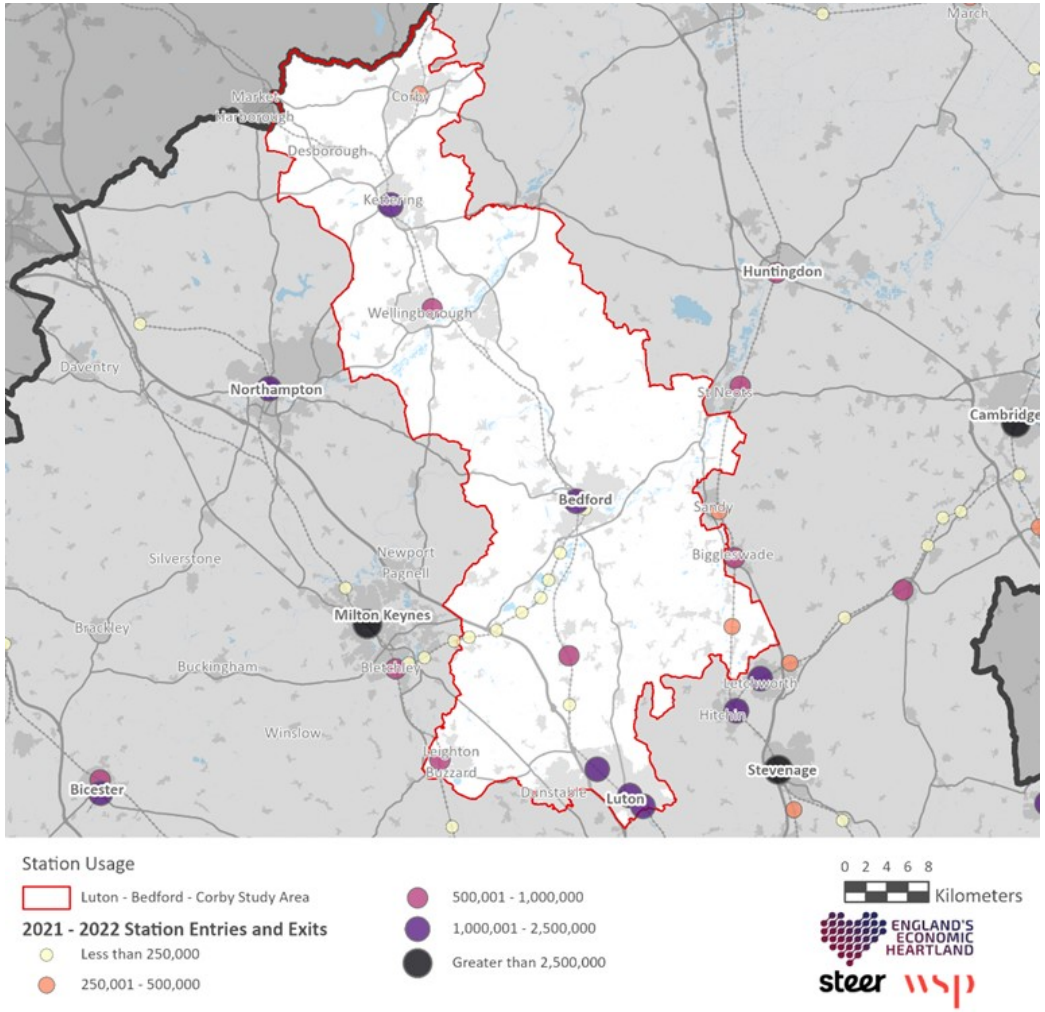
Over 12.3 million entries and exits to railway stations in the study area took place in the 2021-2022 financial year, representing 12% of all station usage in the EEH region (Figure 6-6). The most used station in the study area is Luton, with almost 2.5 million entries and exits alone (20% of the total entries and exits in the study area). The most popular railway line in the study area is the MML with roughly 87% of station usage. Key stations on the MML are Luton, Luton Airport Parkway, Bedford, Kettering, Corby, and Wellingborough.

The least used stations within the study area are on the MVL, with the smaller stations on the line (excluding Bedford and Bletchley) contributing to only 2% of station usage. It is likely that most passengers on the MVL alight at either Bedford or Bletchley, however this usage pattern will likely change with delivery of EWR Phase 2 and Phase 3.

Town centre railway stations generally have higher usage than smaller local stations as they serve larger populations. Converting smaller stations (or implementing new stations) into strategic mobility hubs (i.e. 'parkway' stations) could improve rural rail opportunities and replace car journeys with public transport journey. However, connectivity between individual railway lines within the study area is also limited and the lack of first mile/last mile connectivity and quality bus services, further increases the use of private car.

High station usage on the main railway lines indicates rail travel is important for journeys within, to and from the study area. However, connectivity to and between the study areas' stations remains an issue, particularly for east-west movements.

Figure 6-6 Station Entries and Exits[36]



[36] Source: Station Exists and Entries, DfT, 2022

Bus Network

The bus network provides a clear rural-urban divide with several high frequency bus corridors between some larger settlements and smaller settlements having very low frequency or no services on some or all days of the week.

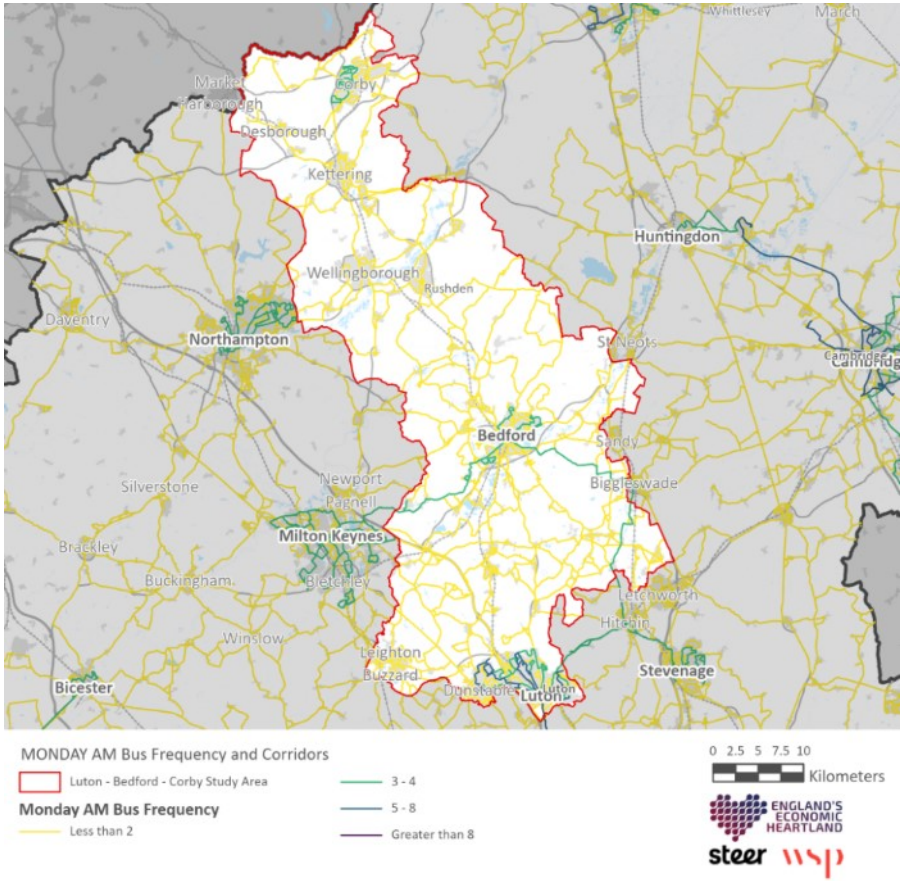
Figure 6-7 illustrates bus frequency across the area's highway network. Services are generally more frequent in urban centres such as Luton, Bedford and Corby, with fewer services found in rural areas. Although inter-urban bus services are limited, there are several key corridors within the study area, which are:

- Milton Keynes – Bedford – Biggleswade
- Luton – Dunstable
- Luton – Stevenage - Biggleswade

The lack of inter-urban bus corridors in the study area reduces the opportunity for sustainable modal shift, hindering aims to reduce congestion and associated carbon emissions. The north of the study area lacks both local and inter-urban bus corridors with Wellingborough, Kettering, and Rushden all experiencing infrequent services. This presents an opportunity to increase service frequency and bus priority in the north of the study area. Within Northamptonshire, a Demand Responsive transport (DRT) currently operates for rural areas (Q & K DRT service), offering an alternative public transport option for smaller communities whilst enabling commercial success for bus operators.

There are opportunities to enhance inter-urban bus services through improved frequencies and new dedicated bus infrastructure. Strategic mobility hubs could also be established in suburban and rural fringe areas to make it easier for multi-modal journeys to be undertaken by public transport (e.g. cycling to the bus stop).

Figure 6-7 Bus Frequency[37]



[37] Source: Bus Route Lines, Basemap, Q1 2022

Access to Key Services

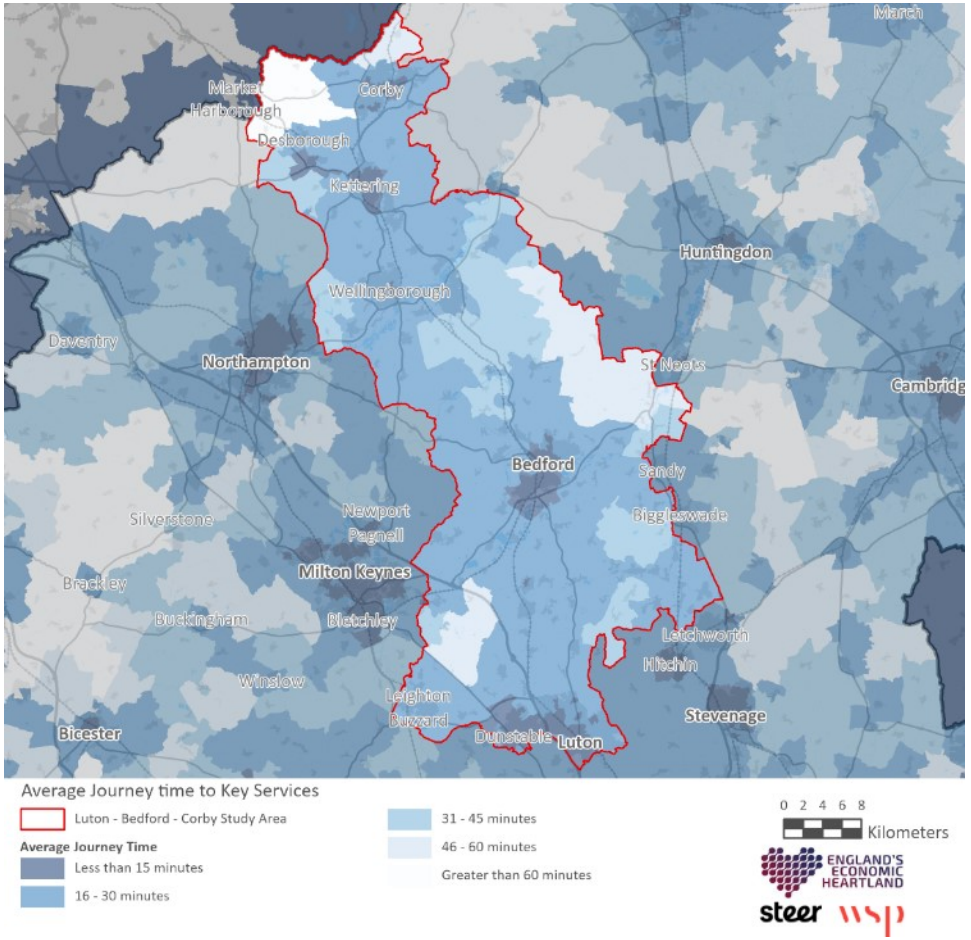
Travel choices are heavily influenced by the accessibility of everyday services and amenities. For sustainable modes to be an attractive alternative to the private car, the journey times must be comparable.

Figure 6-8 shows the average journey time by walking and public transport to eight key services and facilities: medium sized employment centres; primary schools; secondary schools; further education colleges; GPs; hospitals; supermarkets; and town centres. Larger urban centres such as Luton, Bedford and Kettering have better accessibility to key services and lower journey times as services are more densely located, and bus services are more frequent.

Most of the study area can access key services within a 45-minute journey, though some rural areas on the east and west peripheries of the study area cannot, such as Colmworth, Great Staughton and Milton Bryan. This is likely attributed to a lack of local services in these areas and poor bus service coverage.

To reduce car-dependency, public transport and active travel journey times should be competitive with the journey times of private cars, particularly to and from smaller settlements in the study area. However, in these locations high-frequency bus services may not be financially viable and so alternative bus-based arrangements should be explored such as demand responsive transport solutions and micro mobility first mile and last mile solutions. However, the success of micro-mobility modes is dependent upon the provision of high-quality active travel infrastructure to support these journeys.

Figure 6-8 Public transport and walking times[38]



[38] Source: Journey Time Statistics, DfT, 2019

Road Network Capacity and Congestion

To understand the performance of the local and strategic road network through the corridor and identify existing pinch points, the congestion level of service for the morning peak (AM) condition has been reviewed. Figure 6-9 highlights that congestion is predominantly found in the urban centres, where the demand for travel is higher due to increased densities. High levels of congestion can be seen in Luton, Dunstable, Leighton Buzzard, Bedford, Rushden, Wellingborough, and Kettering, as well as in the below locations:

1 – A45/A6 Junction in Finedon

2 – A600 South of Shefford

3 – M1 Junction 13 (Ridgemont Interchange) West of Flitwick

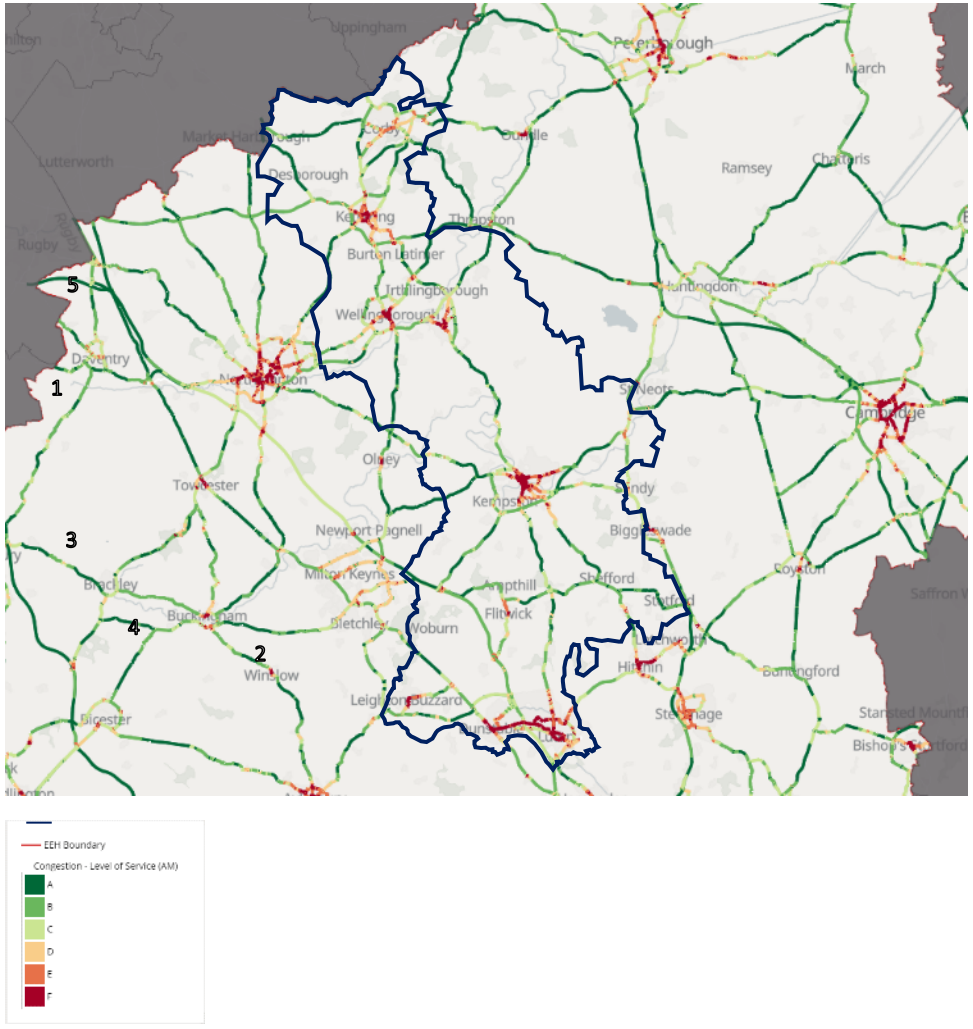
4 – M1 Junction 12 Near Harlington

5 – A14 Junction 10 South of Kettering

The evidence suggests that congestion is an issue in town centres and at the junctions of major motorways and strategic highways. Congestion results in increased journey times, collision risk, air pollution, and carbon emissions for many settlements and the surrounding areas and therefore interventions to minimise congestion across the study area should be explored.

There is a risk that highway improvement schemes to address existing capacity constraints on the local and strategic highway network could encourage the uptake of private car travel. Public transport and active travel interventions should be explored as an alternative to capacity improvement schemes to aid the decarbonisation of the transport system and encourage sustainable modal shift that reduced demand on the existing road network.

Figure 6-9 Road Network Capacity and Congestion[39]



[39] Source: Cityscience research – Network level of service in EEH, Morning peak period in June 2022

Freight Movements

Whilst road haulage is essential to the growth and success of businesses in the study area, it is important to try to minimise its adverse impacts on the environment and local communities.

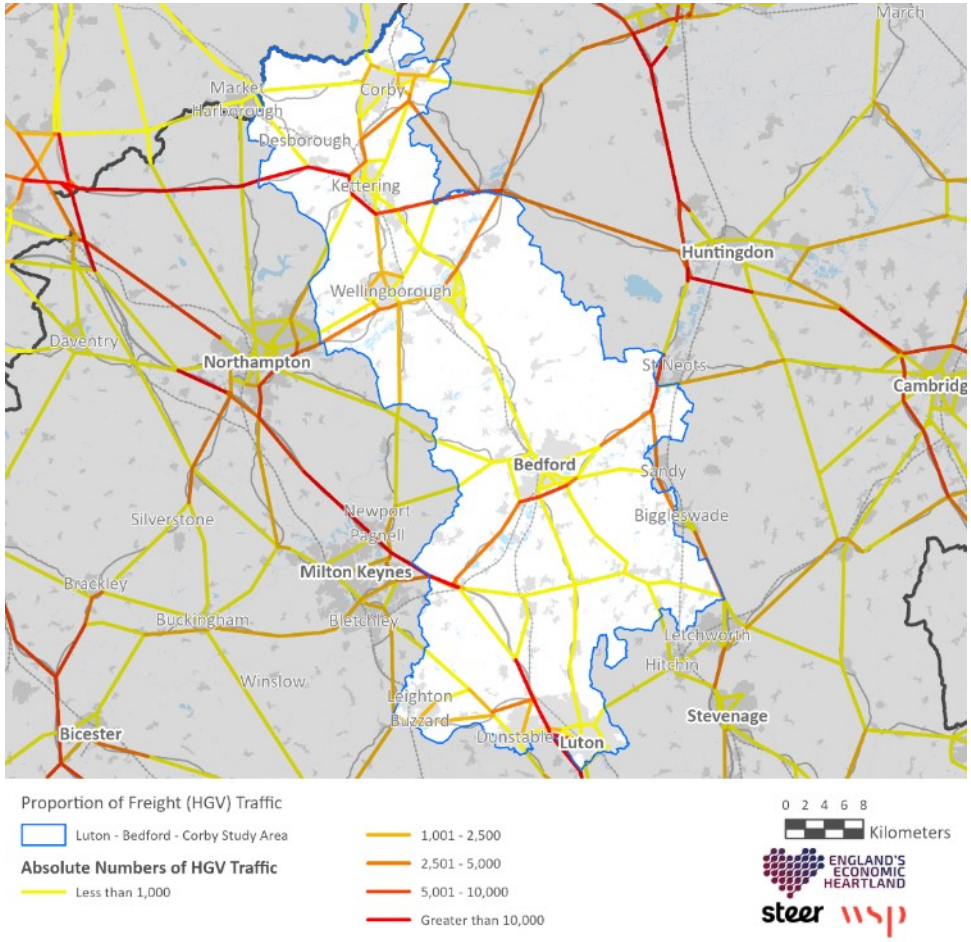
Figure 6-10 Freight MovementsFigure 6-10**Error! Reference source not found.** shows annual average HGV flows on motorways and A-roads within the study area, with over 510,000 daily movements recorded, and the highest average flows found on the M1 (in excess of 9,800 HGV vehicles per day).

Relatively high levels of HGV movements are recorded on routes that run directly parallel to railway links in the study area such as the M1 (parallel to the MML and the A1 (parallel to the ECML).

The data shows that A-roads running parallel to railway links, such as the A6 and A421, have relatively high HGV flows. There are no rail freight terminals within the study area, though key destinations for HGVs such as Milton Keynes, Birmingham and Northampton are likely to make use of the road network in the study area.

There are opportunities to reduce and decarbonise freight movements through the study area. Collaboration between Network Rail, National Highways and local and freight operator stakeholders will be required to increase the capacity of the rail network and interchange availability. The highest HGV flows within the study area run parallel with major railway lines, suggesting rail freight transportation could be a realistic alternative to road freight and as such, opportunities for new rail/road interchanges could be explored.

Figure 6-10 Freight Movements[40]



[40] Source: GB Road Traffic Counts, DfT, 2021

Freight Movements – Proportion

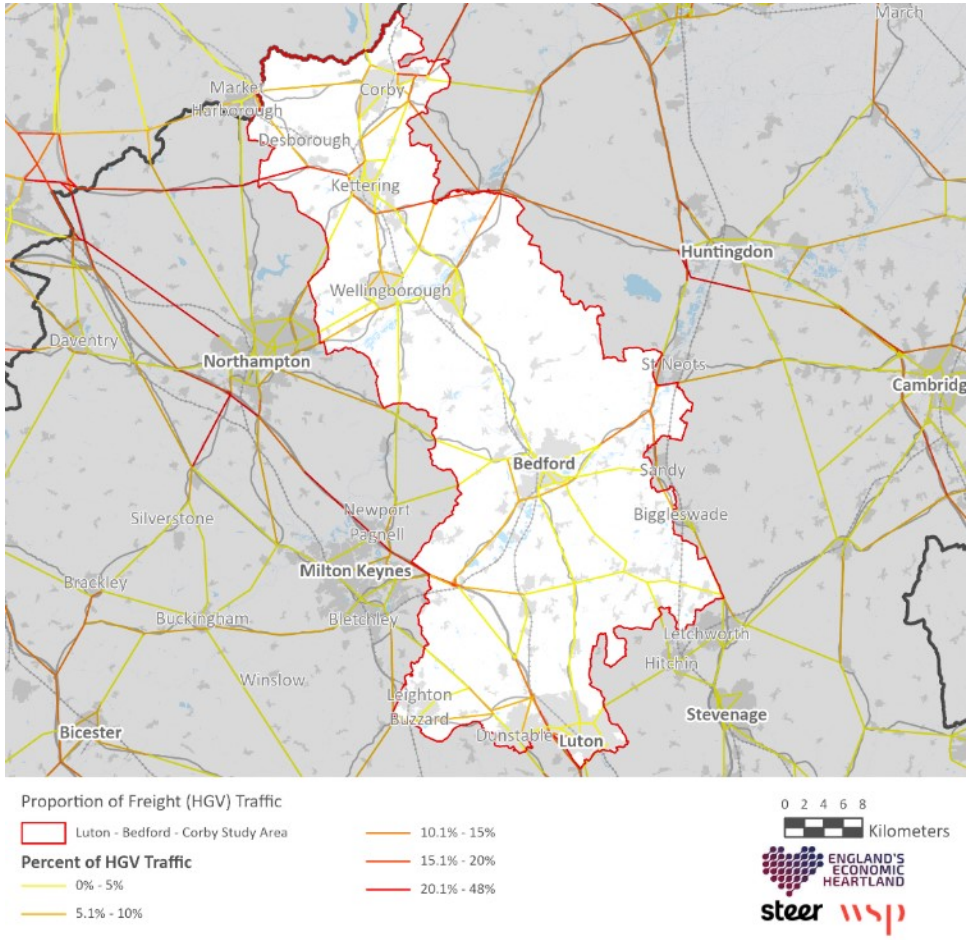
Figure 6-11 illustrates the proportion of freight traffic on major routes in the study area in respect to total traffic carried. Over 510,000 daily HGV movements travel through the study area, representing 5% of all motor traffic.

HGV movements are highest along the A14 and the M1, accommodating roughly 17% and 14% of all vehicular flows respectively. The M1 and A14 are designed to manage HGV flows (inclusion of more than one lane). However, there are several smaller single carriageway roads which have relatively high HGV flows that are not necessarily designed for significant volumes of HGVs.

The A43 northeast of Corby, A509 north of Wellingborough, A5 northwest of Dunstable, A41 and A5 are examples of roads with HGV proportions exceeding 5% of local traffic. This is an issue as these roads do not include the resilience for withstanding HGV breakdowns/accidents. Many of the smaller roads also run through settlement centres, creating road safety and carbon emission concerns for residents. The distribution of these roads indicates a potential lack of adequate HGV routes for east - west movements. The lack of rail lines in an east-west direction also restricts freight movements towards Felixstowe and Bristol from the study area via rail.

HGV freight movements are a barrier for many of the EEH region's future economic and environmental sustainability due to associated high carbon emissions and road safety concerns. There is a lack of variety in HGV vehicle types for freight movement in the UK (especially zero emission), limiting opportunities for sustainable and decarbonised long haul freight movements within and outside the EEH region. Therefore, the use of rail freight and other sustainable options should be heavily considered for the future.

Figure 6-11 Freight Percentage of Traffic[41]



[41] Source: GB Road Traffic Counts, DfT, 2021

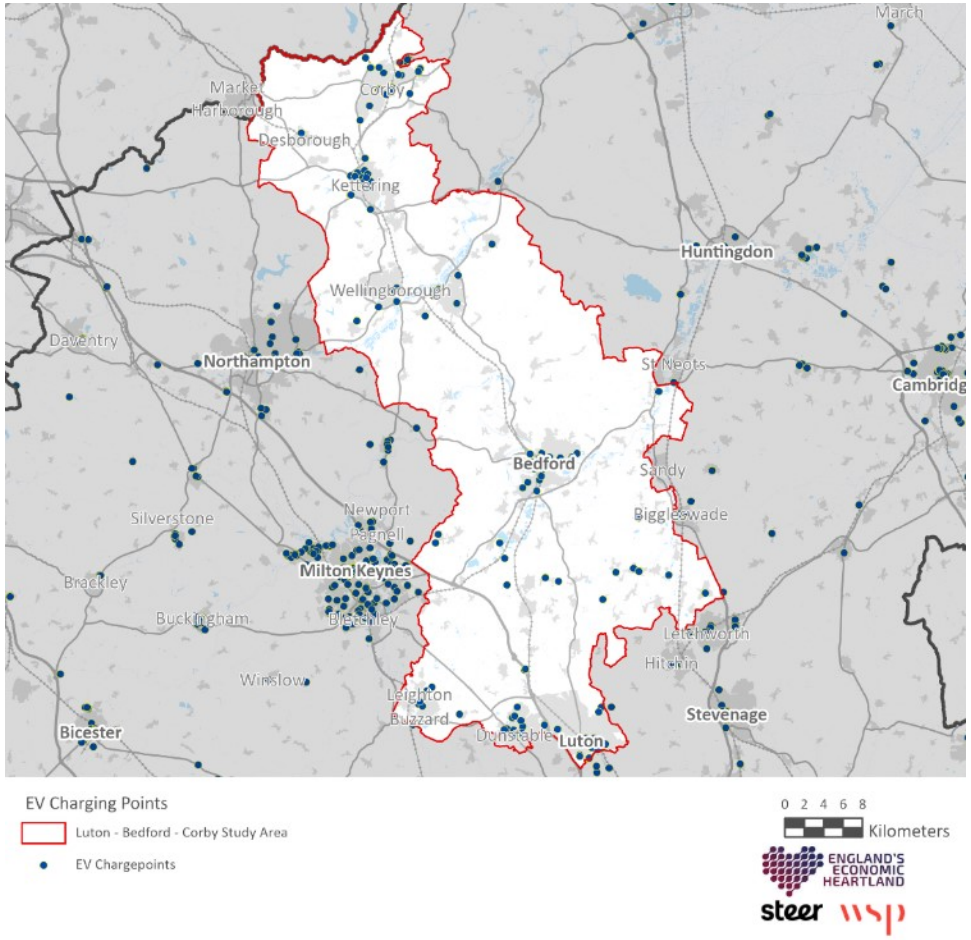
Electric Vehicle Charge Points

Electric Vehicles (EV) are a key component in seeking to achieve net zero targets within the study area and across the EEH region. Figure 6-12 shows the distribution of non-residential Electric Vehicle Charge Points (EVCP) within the study area and across the wider EEH region. There are over 300 non-residential EVCPs in place, accounting for 15% of the total volume in the EEH area.

The distribution of EVCPs across the study area shows a clear urban / rural divide. Most EVCPs are located within larger key settlements, or alongside the major roads in between these settlements. The largest proportion of EVCPs can be seen in Bedford (22%), Luton (19%), Corby (19%) and Kettering (9%). Clusters of EVCPs can also be found in Dunstable, Wellingborough, and Leighton Buzzard. In comparison, there is a distinct lack of EVCPs in rural sections of the study area with no apparent EVCPs in Flitwick or Rothwell, creating a potential barrier for the uptake of zero-emission vehicles in these smaller settlements. Accessible charging stations along the major road network are also inconsistent with the A1 and M1 lacking charging infrastructure outside the major urban areas.

To help facilitate the transition to zero-emission vehicles, transport interventions should consider how EVCPs can be best delivered in residential areas where no-off street parking is available and less populated rural areas where EVCPs may not be commercially viable but is most needed by car-dependent residents, for example in the rural areas to the north-east of Bedford. Consideration must also be given to the capacity of the national grid to accommodate an increase in EVCPs along major roads as well as the provision of EVCPs for buses, LGVs and, as technology progresses, for HGVs.

Figure 6-12 Electric Vehicle Charge Points[42]



[42] Source: National Charge Point Registry, DfT, 2023

Travel Patterns & Behaviour

Journey to Work Origin – Destination Flows

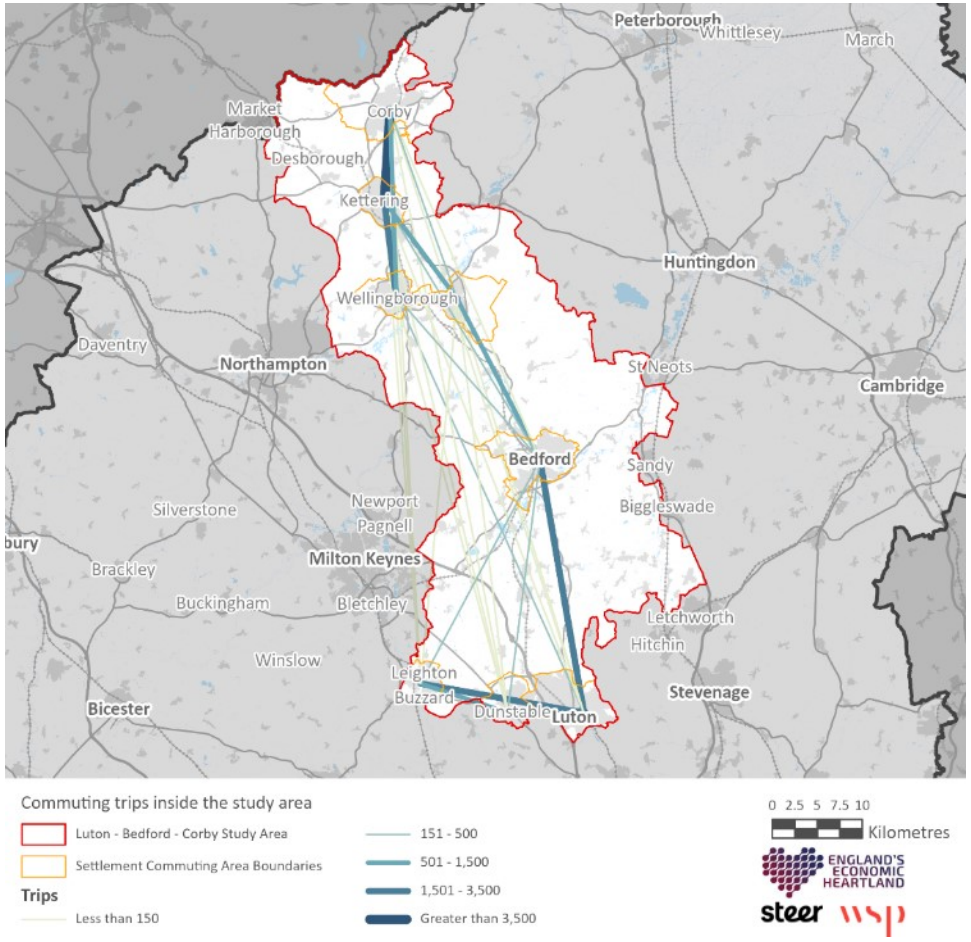
Figure 6-13 sets out the commuter movements from the 2011[43] Census. In 2011, the total number of commuter movements within the study area was just over 355,000 trips. Of these, 35% were intra-urban trips, those being with the origin and destination within one of the 17 key settlements within the study area. An additional 8% of journeys to work were people commuting between these 17 urban centres.

The highest number of commuter trips within just one settlement within the study area took place in Luton (nearly 44,000 commuting trips), which represents 12% of all movements within the study area. The largest number of commuter trips between settlements was between Luton and Dunstable (over 8,800 commuter trips). High commuting flows are also observed in urban corridors between Corby-Kettering, Wellingborough – Rushden & Higham, Kettering – Wellingborough and Bedford – Luton.

The evidence reveals that 26% of trips within the study area travel from rural areas into the main settlements, with Bedford seeing the largest amount of rural commuting into the town. A relatively high level of commuting into London also takes place, notably from Luton, Bedford, Dunstable, and Leighton Buzzard. A notable amount of commuting from London to Luton takes place, likely indicating the economic importance of Luton Airport and associated industries.

Transport interventions which could decarbonise commuter trips include the consistent provision of Electric Vehicle Charging Points throughout the study area, as well as improved east-west bus connectivity between rural settlements and prominent workplace destinations.

Figure 6-13 Commuting Trips[44]



[43] 2021 Data expected to be unreliable due to COVID-19 impact.

[44] Source: WU03EW Location of Usual Residence and place of work (MSOA Level), ONS, 2021

The Origin Destination (OD) matrix in Table 6-1 shows the number of workers travelling between 12 key settlements and other geographical areas by all modes of travel.

Table 6-1 Origin Destination Matrix[45]

Major Urban Settlements	Bedford	Corby	Dunstable	Kettering	Leighton Buzzard	Luton	Rushden & Higham	Wellingborough	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Bedford	26,491	16	190	67	75	1,057	124	108	5,665	2,277	33,793	40,256	6,463	746
Corby	53	18,120	4	2,077	5	20	112	331	1,238	336	21,960	24,693	2,733	1,715
Dunstable	275	3	4,574	1	608	5,535	4	1	835	1,328	11,836	16,999	5,163	286
Kettering	108	2,219	5	11,901	6	24	336	1,277	2,458	413	18,334	22,051	3,717	1,194
Leighton Buzzard	204	6	544	5	5,249	1039	4	13	699	1,740	7,763	14,365	6,602	241
Luton	1,061	10	3348	20	555	43,973	9	86	2,794	6,879	51,856	68,350	16,494	1,284
Rushden & Higham	949	224	15	771	14	93	4,722	1,931	2,414	308	11,133	14,948	3,815	492
Wellingborough	209	259	13	1,008	6	78	775	8,509	2,428	511	13,285	18,485	5,200	699
Rural Area	11,848	1,862	1,158	5,413	783	6,357	2,062	4,522						
London	299	49	280	121	103	2,554	95	259						
Corridor total	41,198	22,719	9,851	21,263	7,301	58,176	8,148	16,778						
EEH	47,594	24,791	12,180	24,165	9,842	70,046	9,409	20,270						
EEH Excluding Corridor	6,396	2,072	2,329	2,902	2,541	11,870	1,261	3,492						
England and Wales	915	2,429	363	1,823	198	5,390	266	1,048						

Key:
The darker colours in the matrix represent the highest flows.

- Red highlights the highest flows between the Settlements of Strategic Importance
- Green highlights the highest flows between the Settlements of Strategic Importance and the rural areas (the rest of the study area).
- Grey highlights the highest flows between the Settlements of Strategic Importance and London.
- Orange highlights the highest flows between the Settlements of Strategic Importance and the study area, EEH region and EEH region excluding the study area.
- Pink highlights the highest flows between the Settlements of Strategic Importance and England & Wales excluding EEH and London

[45] Source: Method of Travel to Work, ONS, 2011 * The Rural Area includes all MSOAs inside the study area, excluding the MSOAs that comprise the 12 key settlements.

Mode Share by Settlements

Table 6-2 shows the journey to work mode share of the key settlements in the study area.

In every key settlement in the study area, car driving is the most common method of travel to work, and an average of 68% of all commuter journeys are undertaken by private car. The highest level of car dependency is seen in Rushden & Higham (eight percentage points higher than the average for EEH), followed by Dunstable (three percentage points higher), whilst Bedford and Luton had the lowest car dependency recorded in the study area.

Cycling has a relatively low mode share in the study area comparative to the overall mode share for the EEH in all areas except for Bedford, having a lower mode share for cycling than the EEH. Travelling to work via train is relatively high in Leighton Buzzard in comparison to the wider EEH region, with a rail mode share five percentage points higher than the average for England and Wales. This is likely reflective of the available rail services from Leighton Buzzard for commuting such as London, and which have significant trip-end restraints which discourage in-commuting via private car.

The evidence shows the journey to work mode share varies across the study area. Bedford has the highest levels of sustainable travel likely supported by a dense residential population and relatively high frequency rail services. In comparison Rushden & Higham has a high level of car dependency, possibly attributed in part due to the absence of rail provision in this settlement.

Table 6-2 Modal Share by Settlement

	Car / Van (Driver)	Car / Van (Pass.)	Bus	Train	Cycling	Walking	Work From Home
Bedford	60%	7%	5%	5%	5%	14%	4%
Corby	66%	11%	6%	1%	3%	10%	3%
Dunstable	71%	6%	5%	2%	2%	10%	4%
Kettering	68%	7%	3%	2%	2%	14%	4%
Leighton Buzzard	66%	4%	2%	10%	2%	11%	5%
Luton	60%	9%	7%	6%	1%	13%	3%
Rushden & Higham	76%	6%	2%	1%	1%	10%	4%
Wellingborough	68%	9%	3%	2%	2%	12%	3%
Rural areas	73%	4%	2%	6%	1%	6%	7%
Study Area Total	**68%**	**7%**	**4%**	**4%**	**2%**	**11%**	**4%**
EEH Total	**64%**	**5%**	**5%**	**6%**	**4%**	**10%**	**6%**
England and Wales Total	**61%**	**5%**	**8%**	**5%**	**3%**	**11%**	**6%**
Key	Highest Mode Share		←		→		Lowest Mode Share

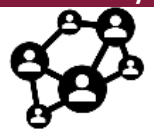
Table 6-3 Current Context – Connectivity: Summary

Theme	Issues	Opportunities
 **ROADS**	**High levels of freight movements through the study area** – HGV freight movements are a barrier for many of the EEH region's future sustainability principles due to associated high carbon emissions and road safety concerns. In the study area the M1 and A1 have high levels of HGV flows between London and the north of England. Issues also persist with HGV movements on local roads through the centre of smaller settlements. **Existing Highway Capacity is limited** – There is little highway connectivity and capacity across the study area, resulting in = congestion at pinch points. The reliance on the A6 for north / south movements restricts traffic movements to a main highway and diversions onto alternative routes with longer journey times.	**Opportunities to move existing road traffic onto railways** – The lack of highway connectivity and capacity for north/south movements could be replaced by enhancing rail capacity on the Midland Main Line and potential mass rapid transit schemes. HGV traffic movements can also be replaced with rail freight to decarbonise through movements of cargo and freight. **Supporting electric and alternative fuel vehicles** – While most journeys pass through the study area, the further expansion of vehicle charging infrastructure and development of strategic mobility hubs could be considered to support the wider transition toward net zero.
 **PUBLIC TRANSPORT**	**Severance between Midland Main Line and the East Coast Main Line** – The Midland Main Line is poorly connected to the other main railway lines particularly East Coast Main Line. Travelling between the two railways becomes difficult as reliance of traditional bus services often creates longer journey times. **Limited-service frequencies for Corby Station** – The existing Corby railway station only offers a daily service northward to Oakham and Melton Mowbray, significantly restricting rural commuting opportunities.	**Rail Accessibility improvements** – To encourage the uptake of rail travel instead of the private car, improvements should be made to enhance the connectivity of the existing rail network, with new stations (notably in rural locations), new bus and mass rapid transit systems and improve active travel networks to stations. **New Rail networks** – The delivery of East-West Rail will help to bridge the severance between the Midland Main Line and the East Coast Main Line. There is also potential for increased services from Corby to Oakham and Melton Mowbray to reduce rural car dependency.
 **ACTIVE MODES**	**Significant lack of Active travel connectivity** – At present the active travel network is limited throughout the corridor, with few Sustrans National Cycle Network routes throughout the study area. Several urban settlements lack active travel routes, making it difficult for commuters to adopt active travel opportunities. **Significant lack of micro mobility solutions** – At present only five settlements found in the north of the study area have micro mobility services being offered, with public E-scooter schemes being operated by Voi in Corby, Kettering Burton Latimer, Wellingborough, and Rushden. This leaves most of the corridor without easy first mile and last mile opportunities for accessing local services and or major public transport facilities, resulting in high car dependency.	**Expansion of a High-Quality Active travel network** – There is an opportunity to create a high-quality active travel network that is compliant to national design standards in LTN 1/20. The use of urban cycle priority schemes along with converting disused rail lines into rural active travel routes could create an expansion of the strategic cycle network. **Realistic opportunity for micro mobility services** – An expansion of micro mobility opportunities within the study area (notably to Luton and Bedford) could support opportunities for accessible active travel options, especially for first mile and last mile movements.

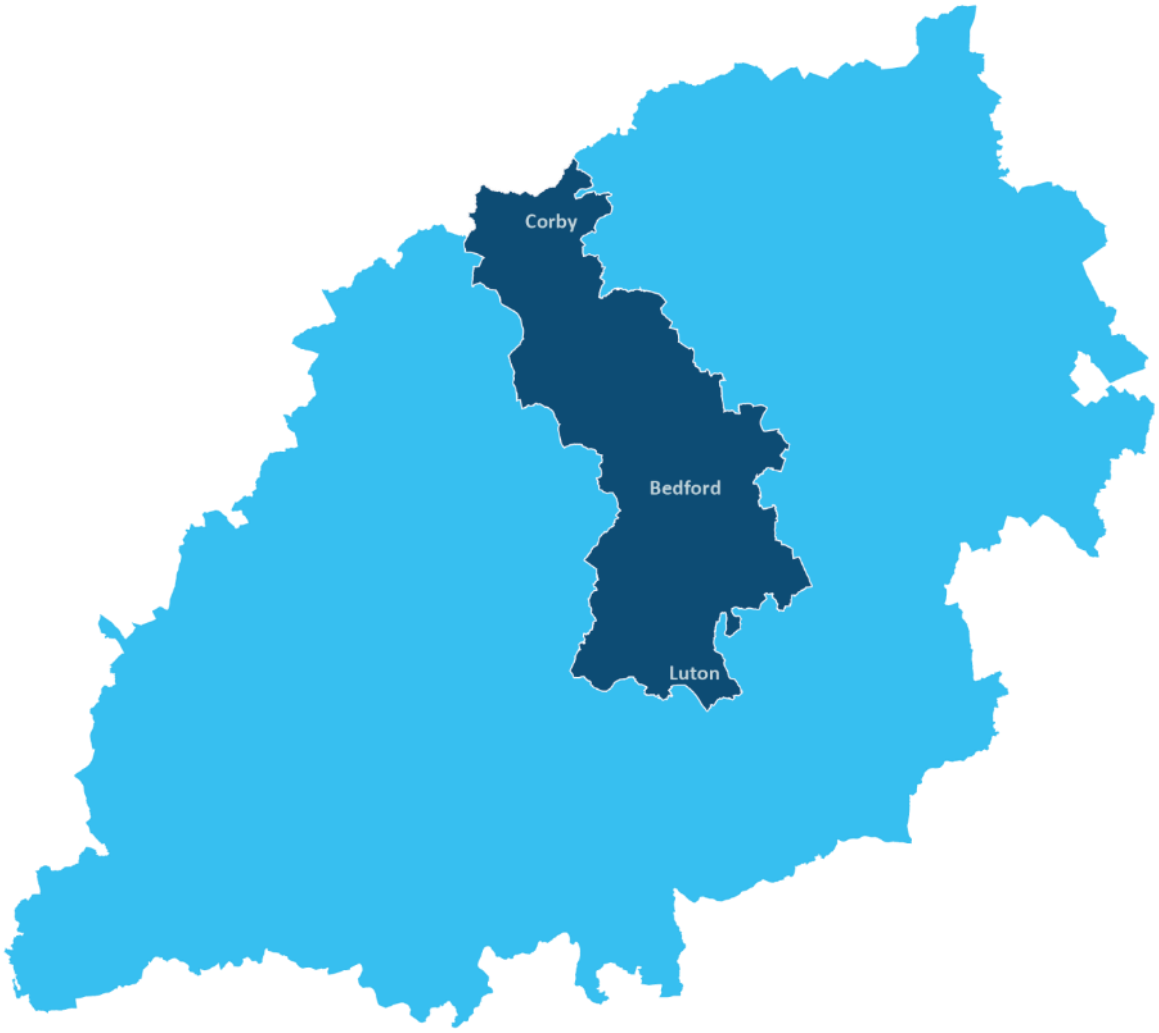
Theme	Issues	Opportunities
 **TRAVEL PATTERNS & BEHAVIOUR**	**Rural populations located far away from goods and services which leads to car dependence** – Smaller rural communities between larger key settlements (notably between Bedford and Rushden) are located further away from services and workplaces and have infrequent public transport services. These factors continue to result in the dominance of private car use in these areas. **Limited Electric vehicle charging network** – The existing electric vehicle charge point network is relatively limited and restricts the opportunities of electric vehicle uptake over tradition internal combustion engine vehicles, especially in rural and smaller urban settlements such as Flitwick and Rothwell.	**Opportunity to reduce commuting trips through increased levels of hybrid working** – Improved digital connectivity, particularly in rural areas such as Eaton Brae and Upper North Dean, where the lowest coverage of connectivity can be found, will help facilitate the adoption of agile and hybrid working practices, reducing the need to travel. **Increased EV charging provision** – Improving the existing electric vehicle charging network will help encourage the uptake of electric vehicle usage over traditional internal combustion engine vehicles. Increasing provision at workplaces could help to decarbonise commuting.

Current Context Summary

Table 6-4 Current Context: People, Place, Connectivity: Summary

People	Place	Connectivity
		
• The evidence base presented shows that the study area is socially diverse, with a mixture of high-income groups residing in north of Bedford, and lower incomes in the urban centres of Luton, Wellingborough, and Corby. • A total of 30% of the population of the study area reside in rural areas. Rural communities have complex needs in respect to travel and accessibility. As such, more sustainable mobility solutions which can successfully lower car dependency in urban areas may not be as effective in rural settlements. The specific needs of these communities must be considered when assessing the potential feasibility of any future transport interventions. • There is a high proportion of commuters in the residential populations in the study area, especially in larger towns like Leighton Buzzard, and Stotfold. Improved public transport and active travel connectivity between residential areas and major rail hubs could decarbonise the first mile of these longer rail journeys.	• The study area spans across Luton Borough, Bedfordshire, and Northamptonshire. As well as several regionally and nationally important road and rail links between London and the north of the UK. As such, many of the movements which pass along these road and rail links are through trips. This is a key challenge as it is something the EEH has less influence over. • Homes are less affordable in the southern settlements of the study area. For many people working in these areas housing will be unaffordable, prompting them to live in other more areas. This has the potential to result in longer, car based, inter-urban commuting journeys. • The southern segment of the study area is encompassed within a green belt spanning between Milton Keynes, Leighton Buzzard and Luton. This has a substantial influence on the location of planned growth within the corridor. This may result in greater medium and long-distance commuting journeys and restrict opportunities by active travel modes. It may also make the delivery of new infrastructure more challenging. • Place-based transport interventions are needed to enable the high number of internal movements in the key settlements, as well as inter-urban movements, to enable the transition away from car dependency to more sustainable modes of travel.	• Major movements in the area are north south in orientation, reflecting rail, road, and HGV movements presented within this evidence base. The delivery of East-West Rail will help to bridge the severance between the Midland Main Line and the East Coast Main Line. Disused railway lines in the area, for example between Bedford – Hitchin and Northampton – Wellingborough – Rushden, present a great opportunity to implement new sustainable travel links. • The most heavily used road freight links in the study area all run directly parallel to railway lines for example the M1 which runs parallel to the Midland Main Line and the A1 which is parallel to the East Coast Main Line. This could mean that the removal of some of this road freight onto rail links could be a realistic opportunity to decarbonise freight in the study area. • Improved digital connectivity, particularly in rural areas further from the main urban centres like Milton Ernest to the north of Bedford, where the lowest coverage of connectivity can be found, will help facilitate the adoption of agile and hybrid working practices, and in turn, reduce the need to travel.

7 Stakeholder Engagement



Call for Evidence

Steering Group & Stakeholder Group

To gain an insight into the key trip attractors within the study area and connectivity issues and opportunities a workshop with the Steering Group and Stakeholder Group has been held. A summary of the key findings and points provided by stakeholders from these sessions is provided below.

Strategic Trip Attractors

- Proposed housing and employment developments across the corridor including Little Barford, Houghton Regis north, South of Bedford and Marston Vale development.
- Rushden Lakes out of town retail development.
- Luton airport expansion (18 – 32 million passenger per annum).
- Luton Town Centre improvements and Football Stadium.
- Future Corby Town Investment plan.
- Significant growth expected around Kempston and Corby.

General Issues

- Future growth throughout the study area may lead to capacity constraints across the EEH infrastructure.
- Delivery of infrastructure is unknown (especially East-West Rail) making future growth planning difficult to manage.
- Volume of aggregate to be imported into the study area is expected to significantly increase, meaning additional trips on the network, expected to be freight.
- An increase in warehouses is expected as well as larger warehouses, potentially around the Daventry and Northampton areas.

General Opportunities

- Potential to plan future developments to have sustainable travel imbedded.
- Proposals for Strategic Rail Freight Interchanges within the area.
- Decarbonisation of freight.

Bus Issues

- lack of revenue / funding for long term bus service improvements across the study area.
- Public Transport connectivity is slow between Leighton Buzzard and Dunstable.

Bus Opportunities

- Bus Priority provision along the A507 connecting Letchworth Garden city to Shefford and Milton Keynes.

Rail Issues

- Some rail stations across the study area currently have accessibility concerns for disabled and visually/audibly impaired individuals (notably surrounding Luton).

Rail Opportunities

- Bedford can become a larger interchange for East West Rail and the Midland Main Line.
- The Midland Main Line has opportunities for new stopping patterns, new stations and express services due to the increased rail capacity.
- Continued electrification of the Midlands Mainline, with options for electrifying the Corby – Syston rail line to create an alternative freight rail option.

Active Travel Issues

- Active travel connectivity impaired by large road networks and junctions (notably the A6/A421 Wixams junction).

Active Travel Opportunities

- Ampthill & Flitwick LCWIP Schemes.
- Central Bedfordshire Rural LCWIP Schemes.
- Dunstable & Houghton Regis LCWIP Schemes.
- North Northamptonshire Greenway network, with new Garden suburb developments to coincide with greenway improvements.
- Marston Vale active travel route from Milton Keynes-Bedford.

Private Vehicle Issues

- A6 suffers from congestion north of Luton and is likely to increase if planned growth in the corridor and EEH goes forward.
- A509 capacity constraints along with environmental impacts restricts potential of capacity improvements.
- Lack of orbital road capacity East of Kettering.

Private Vehicle Opportunities

- Addition of Dualling at sections of poor road capacity.
- Isham Bypass.

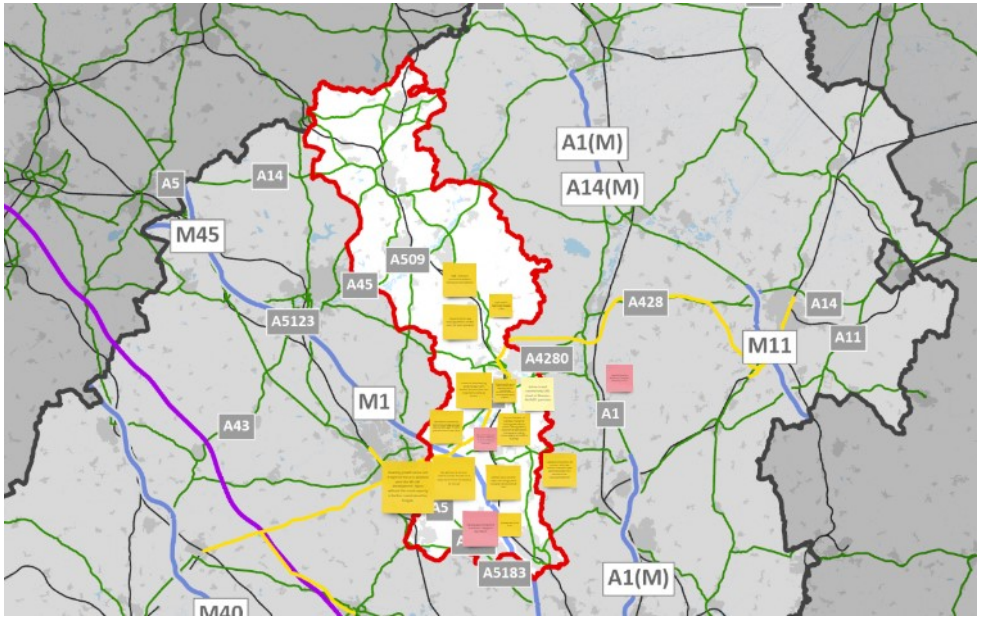
Freight Issues

- Future freight industry growth without increased rail freight terminals will constrain existing network.

Freight Opportunities

- Long term plan for multimodal freight on the Midland Main Line.
- Sundon Rail Freight terminal.
- Freight rail loops at Desborough.
- Conversion of former Forders Sidings to a rail freight interchange to move Rookery South ERF delivery traffic to rail.
- Proposed rail freight terminal currently planned as part of the M1A development to reduce HGV congestion.

Figure 7-1 Steering Group Miro Board[46]



[46] Steering Group Workshop feedback

Summary

The feedback received from the Steering Group and Stakeholder Group have been used to gain an understanding of the connectivity issues and opportunities within the study area which has helped inform the development of the evidence base, which has in turn informed the development of the study objectives and critical success factors.

Figure 7-2: Steering and Stakeholder Input Process

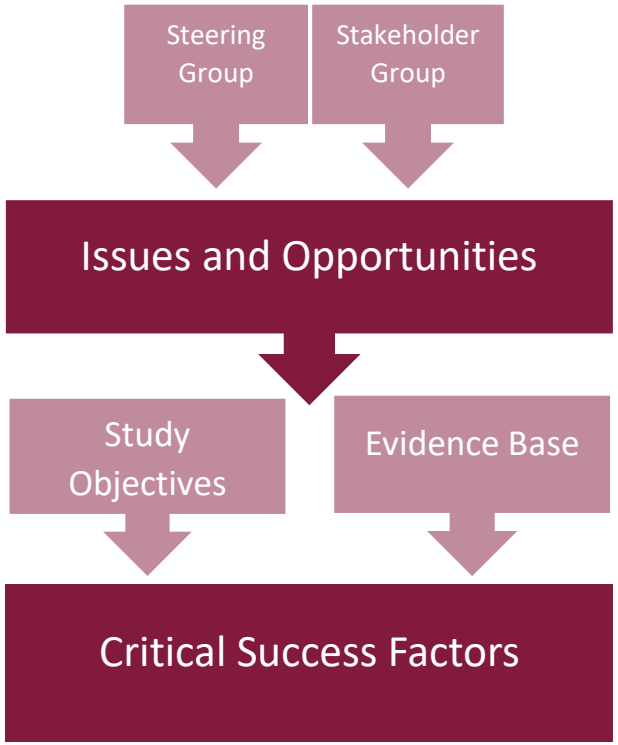


Table 7-1 sets out a summary of the outputs of the Steering Group and Stakeholder Group sessions against the EEH principles.

Table 7-1 EEH Principles, Issues and Opportunities

EEH Principle	Issues Summary	Opportunities Summary
Achieving Net Zero	• Lack of available funding streams to help afford new sustainable / decarbonised transport interventions. • Current lack of Electrification throughout the study rail infrastructure.	• Continued electrification of the Midland Main Line and Corby-Syston Line to offer rail alternative to car travel.
Sustainable and Active Travel	• Active travel infrastructure is constrained at key highway junctions.	• LCWIP scheme delivery and expansions of an area wide greenway network. • Improving accessibility to the Midland Main Line with new/improved stations.
Connecting people and businesses to opportunities	• Existing bus services are slow and little provision exists throughout the study area. • Future growth is likely to create congestion on the A6.	• Improvements to bus priority and interchanges with the Midland Main Line can help replace private car travel and reduce the threat of congestion on the A6.
Efficient Movement of People and Goods	• Future growth might restrict existing road capacity with HGV movements if not planned correctly.	• Numerous opportunities for rail freight interchanges across the study area to replace HGV movements with rail freight movements.

Study Objectives

A key lesson from the Connectivity Study programme was the benefit of having more consistent objectives to focus project team and time-constrained stakeholder attention on considering the needs and opportunities of the study area. As such, from Study Four onward the following set of common objectives have been used and were endorsed by the Steering and Stakeholder Groups formed for this study.

The 10 objectives are based on the issues and opportunities identified in the wider region and are centred around the four key strategic principles from the Transport Strategy:

Table 7-2 Objectives for the Study

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 test the final packages of recommended interventions, a common set of **nine outcome-focused critical success factors were also identified for the programme**.

As with the objectives these were also endorsed by the Steering and Stakeholder Groups.

These factors have been developed to provide:

- an articulation of the need for intervention;
- specificity around the outcomes that need to be achieved through each Connectivity Study without defining what interventions are required for achieving those outcomes;
- the "missing step" between issues and opportunities and option development; and
- a basis for the Multi-Criteria Assessment Framework (MCAF) that will be used to assess the long list of transport interventions.

The critical success factors are drawn from:

- The evidence base;
- The call for evidence;
- Previous steering group inputs; and
- Inputs from stakeholder workshops and discussions.

The Critical Success Factors for this study are:

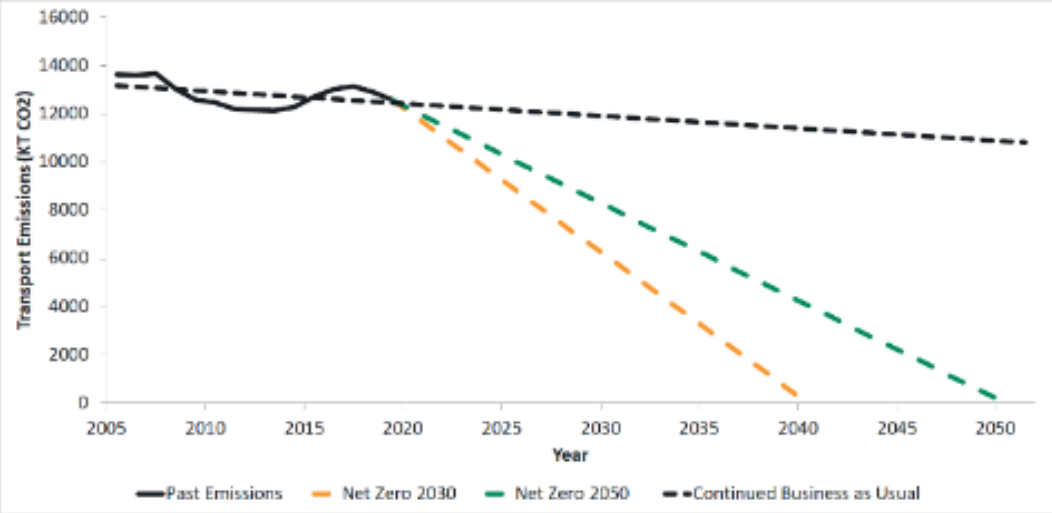
1. The carbon emissions from transport are reduced to net zero with an ambition to reach this by 2040.
2. Improved digital infrastructure reduces the need to travel.
3. A high-quality, sustainable, integrated and accessible transport network connects all places of strategic importance.
4. Improved transport 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 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 all local and first mile last mile journeys, contributing to better connectivity, increased health benefits through increasing physical activity and improved air quality.

1: The carbon emissions of transport are reduced to zero with an ambition to reach this by 2040.

To address the UK's Greenhouse Gas (GHG) emissions, the Government has set a legally binding target of reaching net zero carbon emissions by 2050, which is a challenging target for the transport sector, the largest carbon-emitting sector of the UK economy.

In terms of total transport carbon emissions in 2021, per capita average within the study area was 4.2 Tonnes. This compares with an average of 4.8 Tonnes for the UK as a whole and an average of 5.2 Tonnes for the EEH.

Figure 7-3 Transport Emission Scenarios



Carbon emissions within the study area are heavily focused on the major road network, notably on the M1 which forms a key national road link between London and the north. Luton Airport is also a is a key emitter in the study area, with 8.6% of the carbon emission in Luton coming from this one source.

To achieve net-zero there must be reduction in the number trips made using internal combustion engine cars, vans, LGVs and HGVs and a substantial change in the vehicle fleet towards zero emission vehicles. This will need to encompass both internal trips within the study area, and through trips which start and end outside of the EEH region. This must be coupled with technological solutions to improve vehicle efficiencies and the use of the road and rail networks.

Challenge – Significant intervention is required to move away from Business as Usual and reduce CO2 emissions from transport by 2050. **How can we achieve this alongside EEHs other priorities?**

2: Improved digital infrastructure reduces the need to travel

The impact of Covid-19 has increased the attractiveness of working from home (WFH), increased usage of e-commerce facilities and increased communications via digital platforms – highlighting the importance of access to superfast and ultrafast broadband. The DfT's "All Change?" document outlined the reluctancy of many workers to return to the office on a regular daily basis. As a result, many companies have adopted hybrid working practices, with workers only required to go into the office two or three days a week. While many jobs still need to be done in person, this is likely to be the case from regular office work for many of the historic 'commuters' who reside in the study area. As hybrid working practices become the new "norm", there will be increased pressure on digital infrastructure – particularly in households where multiple occupants are working from home.

The evidence demonstrates that access to high quality internet connectivity across the study is highly spatially varied. The larger urban centres such as Luton, Bedford, Wellingborough, and Kettering all have greater than 80% gigabit connectivity were as more rural areas including Milton Ernest, Blestoe, and Cardington have less than 20%. These areas also have less access to services and facilities in general and thus typically already have to travel further to meet their day-to-day needs, the availability to undertake some of these tasks remotely via high-speed internet connections would improve access and productivity.

Improved digital infrastructure has the potential to reduce demand for transport but also support new transport technologies and businesses that require high speed internet, creating a future demand.

Challenge – Evidence indicates that access to digital infrastructure is variable across the study area, increasing the need for those to travel where availability is low. **How can we make high speed digital infrastructure more accessible?**

3: A high-quality, sustainable, integrated and accessible transport network connects all places of strategic importance

A total of 45 employment sites are planned for construction between 2022-2031 within the study area. The largest amount of employment is proposed for Rushden, with smaller pockets of planned employment development also being found in Bedford, Luton, Corby, and Wellingborough. Most employment developments are proposed on the outskirts of existing key settlements. If new housing and employment developments are not connected with sustainable modes, these sites could naturally develop car dependency. As such interventions should focus upon connectivity between settlements / employment sites where there is a high theoretical demand.

The use of public transport services (notably buses) run into issues of funding and affordability. Proposals for extensive public transport systems will need to consider funding arrangements to ensure consistent and affordable transport for the study area. Consideration must also be given to the affordability of fares. High fares are likely to discourage the use of public transport, particularly by those who currently travel by car.

Challenge – Potential demand between our key settlements is constrained by the transport network. **How can we ensure high quality connections are provided that sustainably meet needs, whilst also being affordable and economically viable?**

4: Rural communities are well connected to services and opportunities by a safe and reliable public transport network

Rural communities are characterised by high car use and dependency, lower public transport availability and lower use of active travel modes. This presents a particular challenge for achieving a net zero transport system.

More sustainable travel options can struggle with taking a foothold in rural communities with lower population densities reducing economic viability for suppliers to provide effective transport solutions. Beyond traditional footpath and bridleway routes that can be varying quality, the rural areas found far from the key settlements within the study area have very little active travel provision and/or public transport services. Most small hamlets and villages normally have limited bus routes with low frequencies and limited operating times, creating very unviable options for travel by public transport. This further reduces the interest in adopting more sustainable travel options as well as isolating local residents from services and employment.

The distribution of active travel infrastructure throughout the study area varies. Across the Sustrans National Cycle Network there is a mix of on-carriageway, segregated and shared-use sections and as such their usability may be limited for unconfident cyclists. The bus network is relatively dense, however, there is a clear rural / urban divide in respect to the frequency and availability of services. The existing high frequency bus routes all run in a north-south direction. The number of east-west bus services is more limited.

There is opportunity to create a high-quality active travel network that is compliant to LTN 1/20. The use of urban cycle priority schemes along with converting disused rail lines into rural active travel routes and create an expansion of the Sustrans National Cycle network.

Challenge – Sustainable travel has historically been absent from rural communities due to lack of population density and commercial viability. **How can we supply commercially viable sustainable travel to rural communities throughout the study area that rivals private car travel?**

5: The transport network supports safe and sustainable distribution of goods within and through the study area via appropriate routes.

Freight connectivity is essential to growth and success of businesses across the study area, with the study area containing nationally important road links for freight providing connectivity between London in the south and the north of England / Scotland. Furthermore, key industries such as automobile and logistics/modern manufacturing present both within the study area and particularly in nearby Milton Keynes.

To ensure adverse impacts on the environment and local communities are minimised, interventions should explore opportunities to manage HGV demand along local A-roads, particularly where they route through or close to urban areas.

Interventions must be investigated both to decarbonize road freight within the study area, as well as to achieve modal shift for freight on to parallel railway lines, without impact upon the ability of these railway line to deliver high quality passenger services.

Challenge – The M1 and A1 are both nationally important road links in the study are which carry high volumes of road freight. **How can we ensure goods are transferred efficiently within and through the study area in a way that supports our four principles?**

6: Everyone can access the benefits of new and improved technologies (e.g. shared electric vehicle services)

Electric vehicles, E-bikes and other shared micro-mobility schemes are key component of a future multi-modal net-zero transport network.

At present only five settlements found in the north of the study area have micromobility services being offered with public E-scooters operated by Voi in Corby, Kettering Burton Latimer, Wellingborough, and Rushden. This leaves a vast area of the corridor with no easy first or last mile opportunities for accessing local services and/or major public transport facilities, causing increase private car usage.

E-bikes are an attractive alternative to a traditional push bike and can help replace short and medium distance journeys that may otherwise have been undertaken by car. However, to encourage the uptake of E-bikes and other forms of micro-mobility, high quality cycle infrastructure must be provided (for example, sufficient charging points and changing facilities at major destinations and strategic mobility hubs). E-bikes could be a great benefit in the study area, as many of the key towns are within close enough proximity to one another to allow for travel by e-bike with a journey time of 25 minutes.

The low volume of EV charging points, particularly outside of larger urban areas, in the study area could potentially limit the uptake of EVs – particularly in rural areas where car dependency is highest.

Challenge – Current provision of infrastructure to support low carbon travel modes ranges across the study area and is lower than other areas. **How can we narrow this gap in provision?**

7: The benefits of new strategic/ major infrastructure are maximised for the whole study geography (e.g. HS2 creates freight capacity on WCML)

Although no direct stations will be present within the study area, HS2 Phase 1 between London and Birmingham is expected to have an impact on the transport system within the study area by unlocking capacity on the existing road and rail networks. This can allow for more capacity on the existing mainlines to be utilised for other journey methods, including the potential for rail freight.

Within the study area itself, the development of East West Rail Phase 2 between Milton Keynes/Bletchley and Bedford, and Phase 2 between Bedford and Cambridge will assist in taking pressure off the existing A421/A428 corridor between these centres. This is especially important given expected increases in residential and commercial development in the area over coming years and decades.

The further development of strategic rail freight interchanges in and beyond the study area will have the capacity to more efficiently more large quantities of freight that may otherwise travel by the Strategic and Major Road Networks. This helps to avoid the impact of HGV movements on communities (such as noise and air pollution), particularly where routes involve local roads.

Freight consolidation and more sustainable first and last mile options can also be integrated into new residential and commercial development, providing benefits to the wider area as well.

Challenge – HS2 will help to release capacity on the West Coast Mainline for more rail travel. **What opportunities arise for both passenger and freight rail services with this new capacity being available?**

8: Improved transport connectivity enables sustainable and high-quality planned development that improve accessibility and links to improved quality of life

A key factor influencing the use of the private car is the accessibility of everyday services and amenities. If everyday services and amenities are easily accessible on foot or by a fast and frequent public transport, sustainable travel patterns can be promoted.

Improved public transport connectivity between areas of high and low income can help residents living in lower income areas access employment opportunities, everyday services and facilities. As much of the deprivation in the study area is within the urban centres, like central Luton, affordable inter-urban connectivity between these centres is a key opportunity, as well as affordable transport links to key employment hubs around the wider EEH.

Proposed housing development locations in the area are often located on the periphery of existing settlements, where existing accessibility is poor. This is likely to result in residents, visitors and workers of these developments relying heavily on private vehicles if accessibility is not considered at the very forefront of development design and placement.

Sustainable transport interventions must target areas where existing accessibility to services and amenities is poor, particularly areas where public transport and active travel does not offer a viable alternative. Furthermore, new housing developments must consider accessibility from the outset and be designed to minimise long distance journeys by incorporating easy access to everyday services and amenities into the developments design.

Challenge – Development is often located where existing accessibility is poorest. To tackle this, issues of accessibility must be considered from the outset when planned growth. **How can we best improve transport connectivity to address inequalities and accessibility issues for planned development?**

9: There is a substantial increase in active travel mode share for all local and first mile last mile journeys, contributing to better connectivity, increased health benefits through increasing physical activity and improved air quality

Active travel modes such as walking, wheeling, cycling (including e-bikes), equestrian and micromobility options like shared scooters are some of the most sustainable forms of transport. Investment in improved active travel infrastructure such as surface renewal and development of segregated routes able to be used at all times of the day and night can have significant wider public benefit, not least in terms of individual wellbeing and public health.

In many locations existing routes are disconnected and or involve sections where users need to interact with vehicle traffic in ways that are or feel unsafe, presenting a clear public safety risk and barrier to realising the network and wider benefits from more people making more trips by active travel modes.

On a wider scale, the distribution of active travel infrastructure varies throughout the study area. National cycle routes provide connections between some of the built-up areas. However, these connections are mostly north-south orientated, like National Cycle Network routes 6, 12 and 57.

At present there is a severance east-west between settlements (for example, between Aylesbury, Luton, and Stevenage). Considerations should be given to the propensity for new active travel 'greenways' to improve the existing east-west severance in the study area. This could make use of existing disused railway lines, such as the Watford to Croxley Branch Line.

Challenge – The map shows that cycling at present is not a prominent mode of travel within the study area. How can we take advantage of the opportunities presented by new forms of mobility and what can be done to ensure affordable options?

Sub-area profiles

Combining analysis of settlement and growth patterns, the form and nature of the transport network, and the landscape structure of the area, has helped us to identify several sub-areas as detailed in Figure 7-4 below. Each of these sub areas has its own place quality, challenges and opportunities, with the most notable being:

1 Corby-Kettering-Wellingborough-Rushden:

Already connected by rail, and with good interurban road connections the main opportunity for this necklace of established, medium-sized settlements - with a combined population of over 200,000 - may be in establishing a co-ordinated plan for movement and development at the scale of the network of towns - involving improved first-mile-last-mile public transport linked to development locations, as well as road space reallocation within existing settlements. This co-ordinated plan would include the nascent North Northamptonshire Greenways project and Ise Valley Linear Park, to provide a complete network of routes linking the larger centres to each other and to the smaller towns and villages in the area. The aim of this closer integration of the settlements would be to unlock greater choice for residents and potential economic agglomeration benefits across the five towns.

2 Bedford:

There is a significant opportunity, aided by completion of the A6 bypass in 2016, for reform of street space within the historic centre and on key routes into town from the suburbs to support increased active travel to/from existing neighbourhoods and new fringe employment areas and developments, helping to tackle congestion and environmental impacts of the outdated highway layout within the town centre. This would also support further regeneration and intensification of major brownfield sites around the river frontage, hospital and railway, linked to anticipated changes to the two town-centre stations associated with East West Rail.

Continued growth in Marston Vale needs to be carefully co-ordinated with East West Rail and supporting public/active travel measures to maximise the potential of this location – which could sustain much higher densities than are currently planned - and to establish the best possible relationship with Bedford itself.

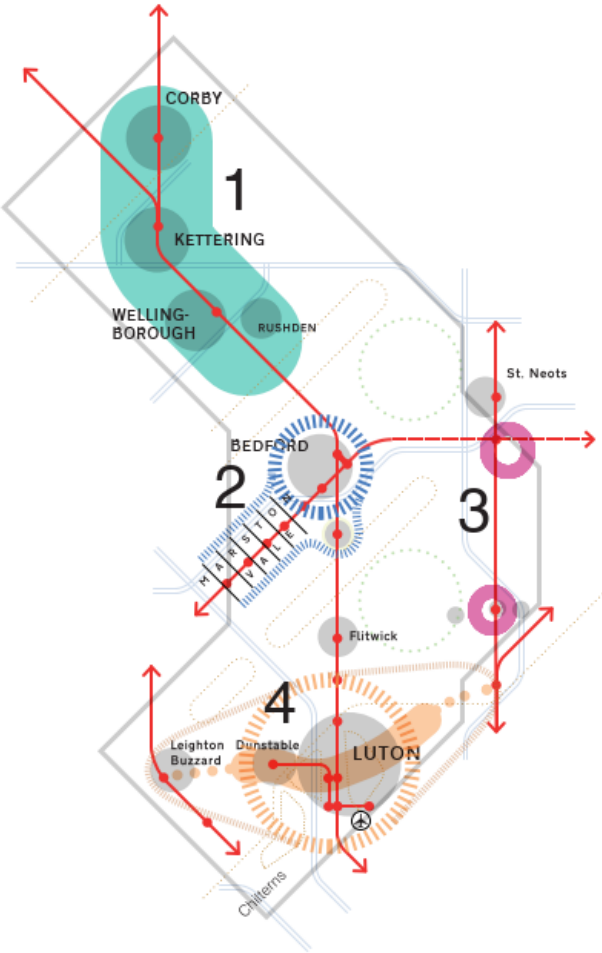
3 Ivel Valley:

There are potential growth points around both existing stations (e.g. Arlesey) and new/proposed station/s (e.g. Tempsford) on the East Coast mainline, that will need to provide exemplary local active travel connections, including to existing nearby settlements, in order provide choice and limit the potential impact of increased car usage in these areas. The Tempsford site in particular, subject to fully understanding landscape and infrastructure constraints, has the potential to accommodate a major new settlement.

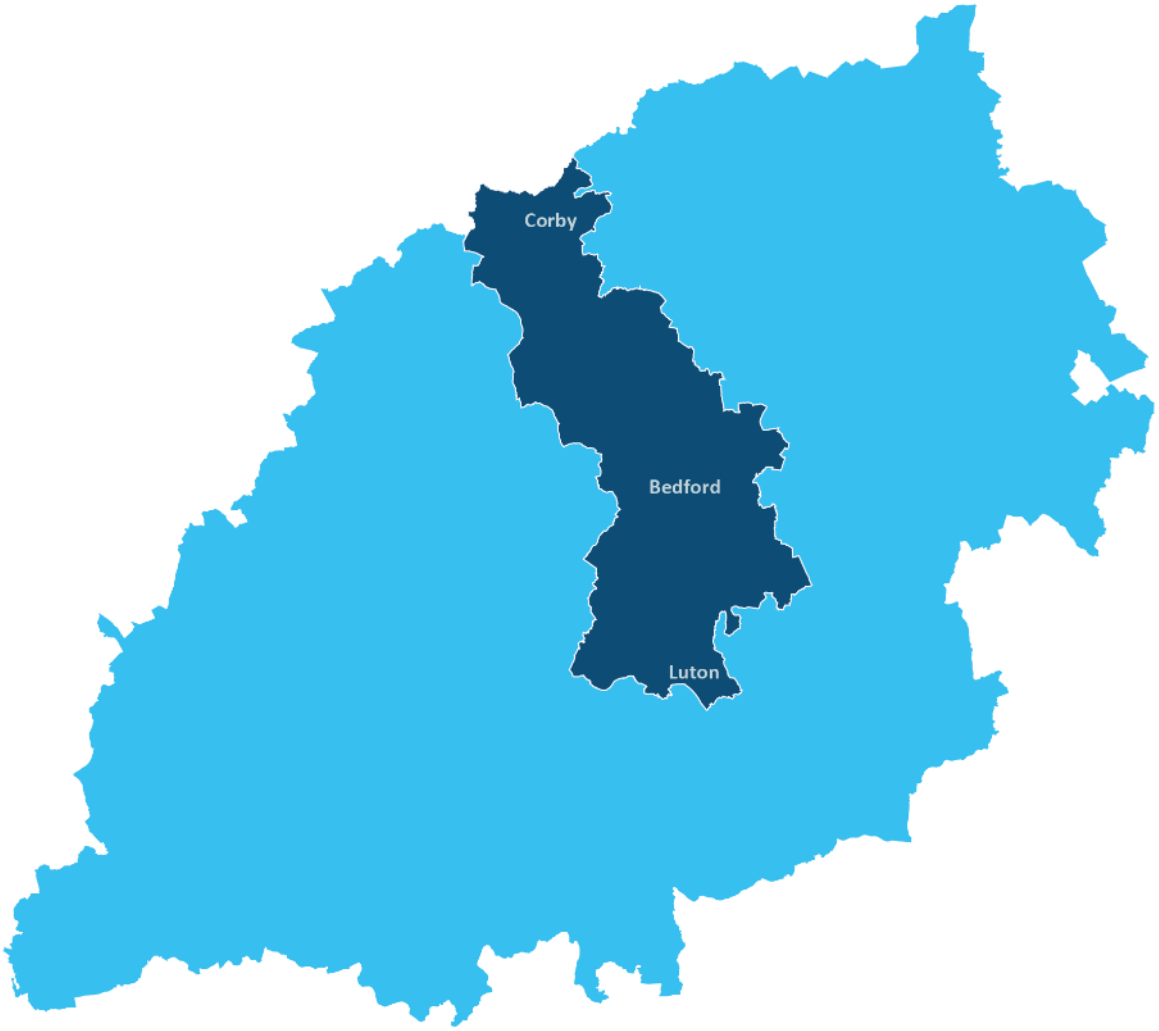
4 Luton + Dunstable:

Surrounded by green belt and bracketed by the Chilterns, much of Luton's potential future growth will be accommodated through intensification and renewal within the existing urban area, particularly around its two main stations. Connecting existing and new population and employment points from Leighton Buzzard in the west via the existing busway through Dunstable and Luton, and towards through east Luton to Hitchin/Stevenage (and hence East Coast and West Anglia rail corridors) in the east, could help address congestion in these areas, alleviate pressure associated with Luton's constrained setting, as well as addressing a gap in strategic public transport network east and west from Luton.

Figure 7-4 Locations of sub areas



8 Future Context

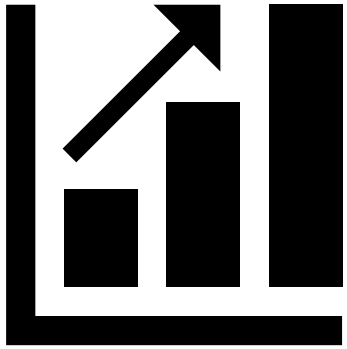


Overview

Background

This chapter sets out the scale of the growth challenge and provides an understanding of the committed transport improvements schemes within the study area. It also demonstrates the potential implications of planned growth if they are not provided alongside high-quality transport infrastructure and implemented without the premise of reducing the high levels of car dependency identified earlier in this evidence base.

Growth Challenge



The study area faces substantial levels of housing and employment growth that will result in considerable increases in population, jobs, and travel demand. Unsustainable car-dependent developments will negatively impact upon the local environment, levels of sustainable travel and the quality of place. This section will assess the implications of planned growth against the extent of committed transport improvement through the study area.

Covid-19

The undesirable arrival of a shock event, such as the 2019 Covid-19 Pandemic, required a fundamental shift in how society and business operate on a day-to-day basis. The pandemic resulted in the acceleration of several mobility patterns such as working from home, active travel, increased freight and increased local deliveries. Whilst some of these trends were short lived, some have persisted to at least some degree including increasingly flexible, remote and hybrid working practices.

Future Growth Sites

Residential Sites

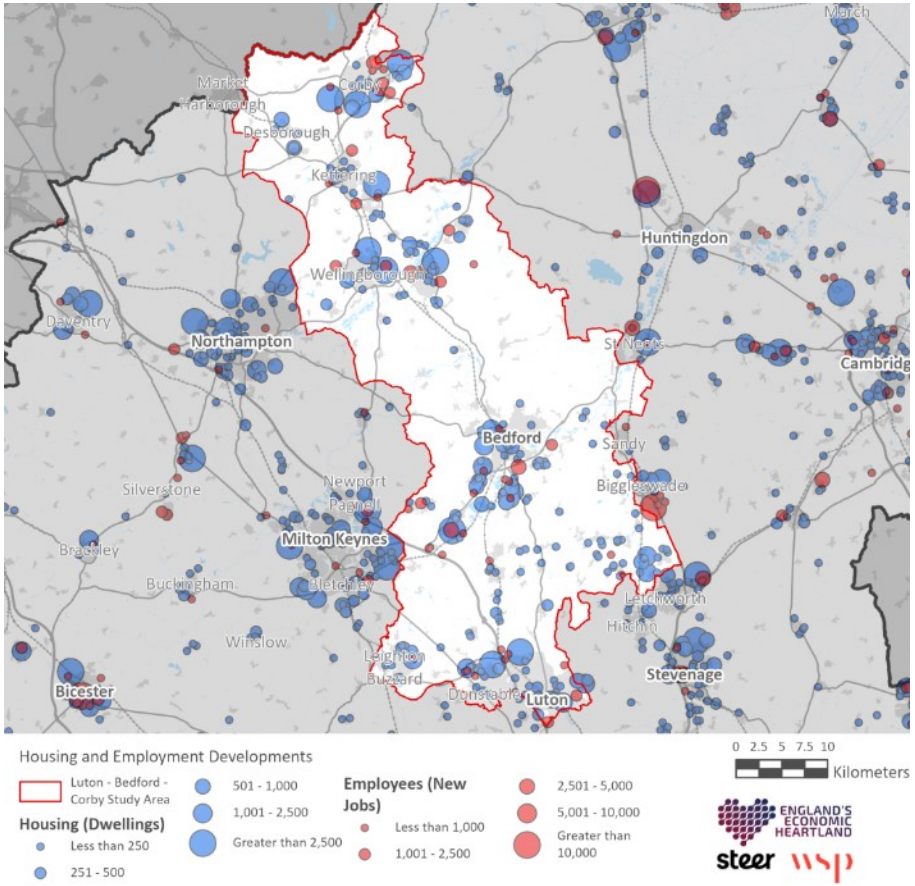
Figure 8-1 illustrates the 270 planned residential developments in the study area which have been identified by local authority planning departments and which are scheduled for construction between 2022 and 2031. Through construction of these developments, it is forecast that almost 100,000 new dwellings will be added to the area. This increase in dwellings represents 21% of all the proposed residential development in the period up to 2031 within the entire EEH region. The majority of proposed planned residential dwellings are located on the outskirts of existing key settlements. The largest residential development within the study area is in Kettering with a forecast of more than 5,500 dwellings.

Employment Sites

Within the study area, a total of 45 new employment sites are planned for construction between 2022 and 2031, moat on the outskirts of existing key settlements. Around 9,200 new jobs are estimated to be created through this planned development, representing 18% of the planned employment development in the overall EEH region. The largest amount is proposed for Rushden, with smaller pockets in Bedford, Luton, Corby, and Wellingborough.

A significant amount of planned development is forecast within the study area, with the majority located on the outskirts of existing key settlements. New housing and employment development should be integrated into the existing transport network. If new development is not connected with more sustainable journey options, car dominance and congestion could increase. New multi modal or mass transit transport schemes may present an opportunity to deliver efficient movement of people and goods.

Figure 8-1 Housing and Development Sites[47]



[47] Source: EEH Databank, 2021

Future Population

TEMPro Working Age Population Forecasts

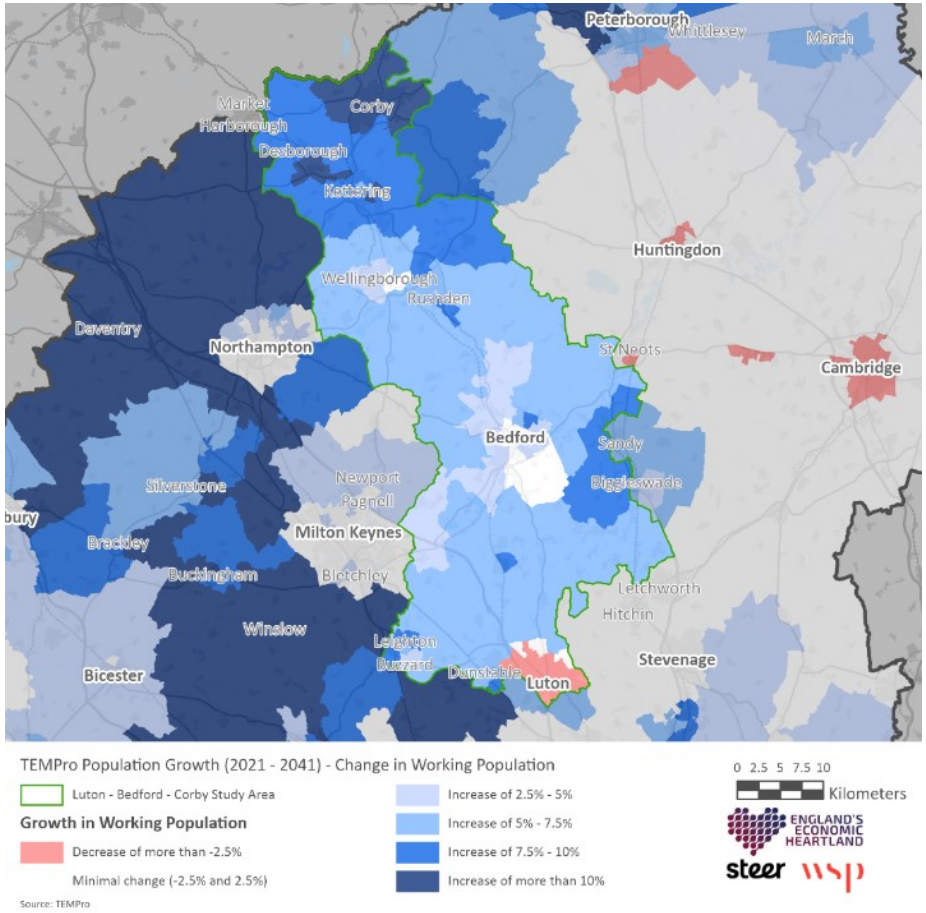
The Trip End Model Presentation Program (TEMPRO) is a DfT software tool which provides forecast trips by mode, time, trip purpose and by area. The total working age population (people aged 16 – 74 years) in the study area is expected to grow to 63,854 by 2041, representing 27% of forecast workplace population growth in the EEH region.

The MSOAs within the study area that are expected to experience the largest local growth in working age population are mostly situated in the north of the study area as shown in Figure 8-2. The highest levels of growth are expected to be in Corby, Kettering, and South Desborough with increases of upwards of 20% compared to a 2021 baseline.

Although the majority of the study area is expected to increase in working age population, Central Luton is expected to see a decrease in working age population. An average decrease of around 5% in working age population is expected across Luton, indicating an aging population and potential reduced economic activity.

Without mitigation, population growth in rural areas and on the outskirts of existing key settlements in the north of the study area is likely to result in high levels of car dependency (e.g. South Desborough and Shefford). New development and areas where significant population growth is forecast should offer an accessible and an integrated transport network in order to support more sustainable journeys. This is also important in areas where an aging population is forecast, such as Luton.

Figure 8-2 Population Growth[48]



[48] Source: TEMPro Population, ONS, 2021

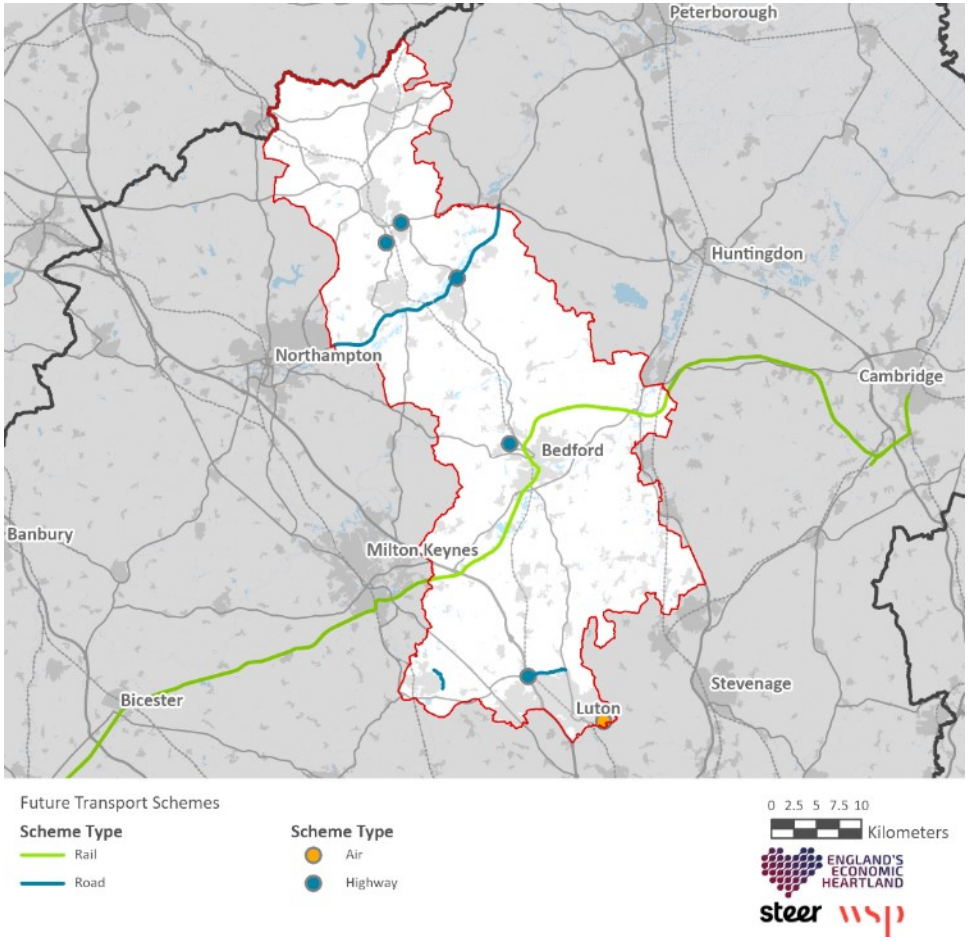
Transport Improvement Schemes

There are several strategic transport improvement schemes scheduled to be delivered within the study area as shown in Figure 40. These schemes include:

- **London Luton Airport Expansion:** Expansion to Luton airport services which comprise of expansion of Terminal 1 and building new Terminal 2 with associated passenger facilities.
- **East West Rail:** Phase 1 of EWR covering Bicester Village to Bletchley / Milton Keynes is currently under construction. Phases 2 and 3 are a future improvement for a new connection from Oxford to Cambridge and as such is covered in the current context section of this Report. A preferred route alignment for EWR between Bedford and Cambridge was published in May 2023.
- **Several Highway Bypass Schemes Including:** Luton Northern bypass, Leighton Buzzard East Link Road and the Bedford Western bypass.
- **Other Schemes Include:** A45 Northampton Highway Management Scheme, A14 Junction 10 Improvements near Burton Latimer, A509 Isham Bypass and A45/A6 Chowms Mill Junction Improvements.

Future transport improvements proposed within the study cover a mix of transport modes, including road, rail, and air. In order to tackle car dependency, congestion and to achieve a decarbonised transport system future investment should be focused on prioritising active travel schemes and public transportation/mass transit schemes.

Figure 8-3 Future Transport Schemes[49]



[49] Source: Local Authority Major Transport Schemes, Highways England RIS 2, Network Rail's 2019-2024 Delivery Plan

COVID-19 Recovery

The start of the Covid-19 Pandemic in 2020 required a fundamental shift in how society and business functions advance through a difficult period of uncertainty. Under the resulting lockdowns, some mobility trends were accelerated (for example: working from home; active travel; increased freight and more local deliveries) whilst others were paused or moved in the other direction. Whilst some of these trends were short lived, such a fundamental pause in everyday life has undoubtedly led to some longstanding lifestyle changes in behaviour.

The outbreak of COVID-19 and the measures taken by the government to suppress the spread of the virus has exerted a far-reaching impact on people's job, livelihood and well-being. Society and the economy have gradually opened up since 2022 and the UK government has another shift in measures to help restore the largest fall in GDP in 300 years in the UK[50]. These measures have adapted changes in work-life daily routines through the pandemic period. Some of them are in particular related to transport issues, which allow more flexibility in time and workplace of job, as well as in daily behaviours. Examples of measures taken by organisations include:

- Investing in IT systems to support remote working;
- Maintain the capacity of home delivery services;
- Reinstate or increase the frequency of bus services in medium-long term;
- Restored local services after lockdown, e.g., GP, shopping, and schooling; and
- More room for industries to choose their preferable hybrid working style.

Attitudes to Public Transport

Traffic volume of different transport modes in the UK has shown great variations through pre- and post-COVID periods. According to Department for Transport data,[51] compared with the traffic volume just before the pandemic, typically the first week of February 2020, traffic volume in February 2023 suggests:

- Car reliability is slightly lower on both weekdays (approximately 91% of pre-COVID volume) and weekends (about 95% of the pre-COVID level).
- Light commercial and heavy goods vehicles have recovered – even exceeding the pre-COVID level (around 110% and 100%, respectively).
- The volume of public transport including national rail, bus and London tube fluctuates at 80% to the pre-COVID level.
- Cycling recovered to above 85% during weekdays and the usage is higher during weekends – approaching 100%.

Although physical restrictions on travel have been removed, there has been a reluctance to return to public transport use, partly due to the adoption and continuation of hybrid working. Careful consideration will need to be given to how public attitudes on the safety of travelling by rail and bus can be improved.

Consideration will also need to be given to the provision of more flexible ticketing, as with the adoption of hybrid working, many people are only commuting a few days a week and no longer buying season tickets. There is a risk that high single-day public transport tickets could encourage the use of a car.

[50] Office for Budget (2020), Fiscal Sustainability Report. [Online]. Available at: Fiscal sustainability report 2020 - Office for Budget Responsibility (obr.uk) [Accessed 29 March 2023].

[51] Source Daily domestic transport use by mode - GOV.UK (www.gov.uk)

Work From Home

The biggest impact of Covid-19 has been the increased usage and attractiveness for work from home (WFH) behaviours. A total of 40% of all adults began working from home at the start of the first lockdown. The DfT's "All Change?" document has outlined the reluctancy of many workers returning to the office on a regular daily basis.

Several large companies have established policies outlining WFH patterns that can be allowed for employees in the future. British Airways, BP, and Nationwide have outlined that WFH will become an accepted practice for at least a few days a week. As more organisations embrace the use of WFH, total commuting trips will fall. Ideas surrounding agile working are also starting to appear, with

locations and hours dictated by the employee. WFH and Agile working will have several impacts on the future of transport and developments:

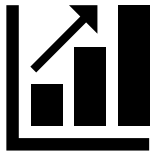
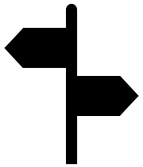
- **Significantly reduced greenhouse gas emissions from reduction in commuting**. Covid-19 lockdown led to a 42% reduction in Nitrogen Dioxide levels.[52]
- **Changes to the way offices are structured**: Savills found that office vacancy rate increased from 4.9% to 8.9% from early 2020 to 2022 in London, gradually recovering from its peak in 2021.[53]
- **Back to the office:** Many businesses are now trying to slowly get employees to return to the office. Large companies such as Amazon have recently been re-implementing an 'office -first' policy.[54]

[52] Lee, J. D., Drysdale, W. S., Finch, D. P., Wilde, S. E., Palmer, P. I. (2020) UK surface NO2 levels dropped by 42% during the COVID19 lockdown: impact on surface O3. Atmospheric Chemistry and Physics Discissions. [Online]. Available at: https://acp.copernicus.org/preprints/acp-2020-838/acp-2020-838.pdf **[Accessed** 1 September 2021].

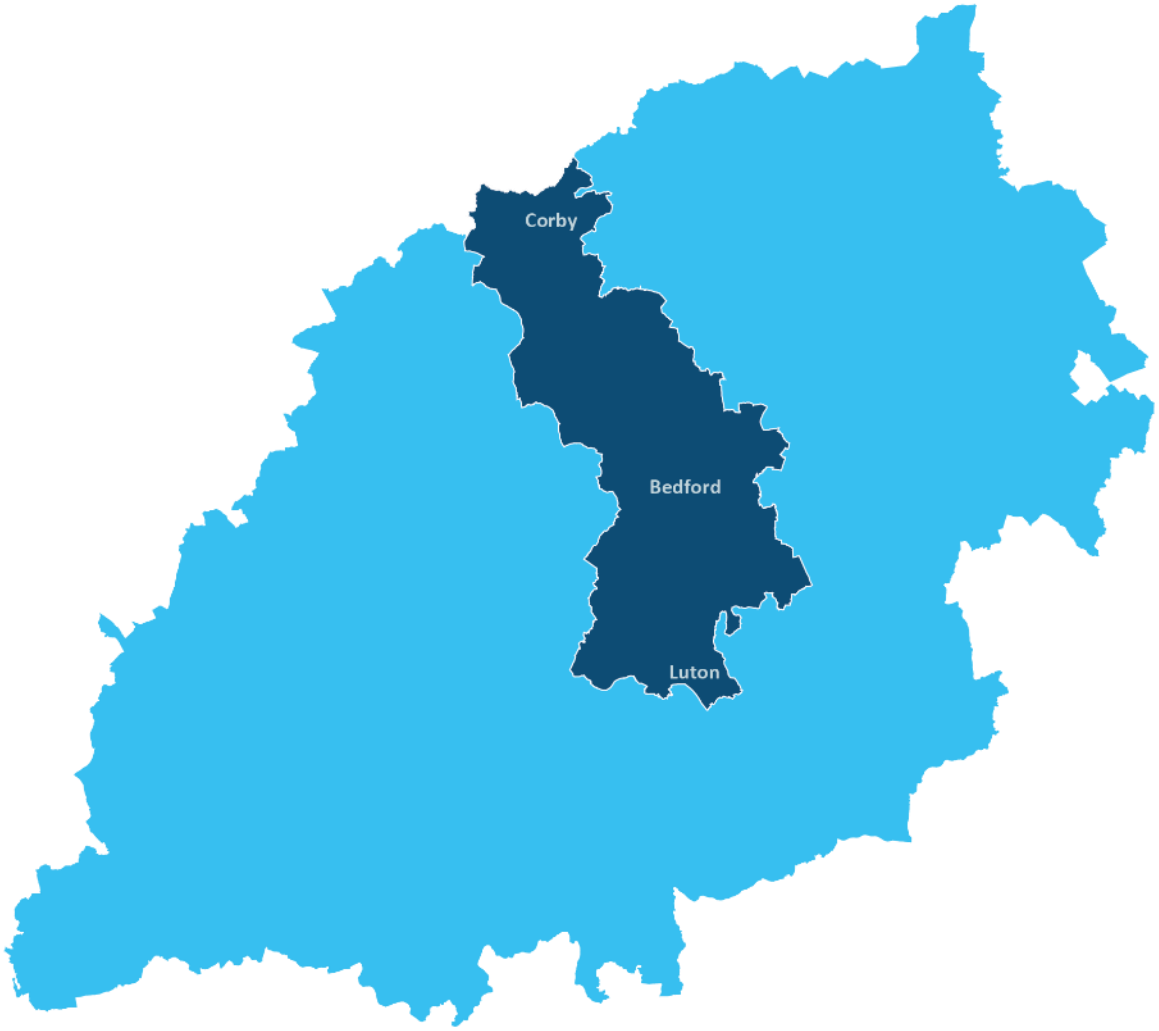
[53] Savills (2022) Market in Minutes: City Office Market Watch. [Online]. Available at: https://www.savills.co.uk/research_articles/229130/325540-0 [Accessed 1 September 2021]

[54] CNBC (2023) Amazon employees express dismay, anger about sudden return-to-office policy. [Online]. Available at: https://www.cnbc.com/2023/02/21/amazon-employees-express-dismay-about-sudden-return-to-office-policy.html **[**Accessed 24 September 2023]

Table 8-1 Future Context: Summary

Theme	Issues	Opportunities
 **FUTURE GROWTH**	**Increasing pressures on the existing transport network due to growth -** Substantial levels of housing and employment growth are planned within the study area over the coming decades. The largest amount of employment is proposed for Rushden, with smaller pockets of planned employment development also being found in Bedford, Luton, Corby, and Wellingborough. There is a risk of increased pressure on the existing transport network, and car dependency if more sustainable travel options and an integrated transport network is not provided. **Lingering impact of the movement restrictions associated with the COVID-19 pandemic -** Bus and rail patronage is still below pre-Covid-19 levels. Lower levels of demand for existing bus and rail services threatens the commercial viability of existing services. Traditional commuter travel patterns are changing with an increasing proportion of people with the option to do so adopting hybrid working arrangements and only commuting a few days a week.	**Opportunity to deliver well planned developments which minimise the need to travel -** The creation of neighbourhoods where residents' day-to-day needs are within a short walk or cycle distance – reducing the need for residents to undertake these journeys by car. To support this future development should apply LTN 01/20 Design Guidance. New developments should also support high quality public transport connections, where public transport offers a real alternative (in terms of cost and journey time) to private car use for everyday journeys. For example, new housing developments on the outskirts of Bedford should consider first and last mile connections to key regional commuter hubs like Bedford Railway Station. **Capitalising upon hybrid working practices which saw a strong uptake during the pandemic -** New residential developments have the opportunity to provide high quality broadband infrastructure which would allow greater volumes of people to access services remotely, potentially reducing levels of commuting whilst simultaneously improving residents access to employment and other opportunities available digitally.
 **TRANSPORT SCHEMES**	**Investment is still focussed on delivering improvements which benefit the private car -** Some planned interventions within the study area remain as road-based solutions. This includes the Leighton Buzzard East Link Road. Such interventions offer little focus on reducing car-based commuting. **East-west severance with public transport being an unrealistic method of travel for relatively short journeys -** The delivery of East-West Rail will help to bridge the severance between the Midland Main Line and the East Coast Main Line. Future transport improvements proposed within the study should be focused on prioritising active travel and public transportation to reduce car dependency, tackle congestion and promote a decarbonised transport system.	**Opportunities for modal shift to new Mass Rapid Transit schemes -** New mass rapid transit schemes can help to connect settlements which lack public transport options or active travel connectivity. Disused railway lines in the area, for example between Bedford – Hitchin and Northampton – Wellingborough – Rushden, could present an opportunity to deliver new sustainable travel links. **Opportunities to improve place making -** New bypass schemes such as Leighton Buzzard East Link Road present an opportunity to improve placemaking along existing local roads by removing strategic traffic from unsuitable local roads and smaller communities. By removing through traffic this can make local roads more attractive and suitable for walking and cycling. This would further encourage shorter intra-urban trips to be undertaken by active travel.

9 Need for Intervention



SWOC Analysis

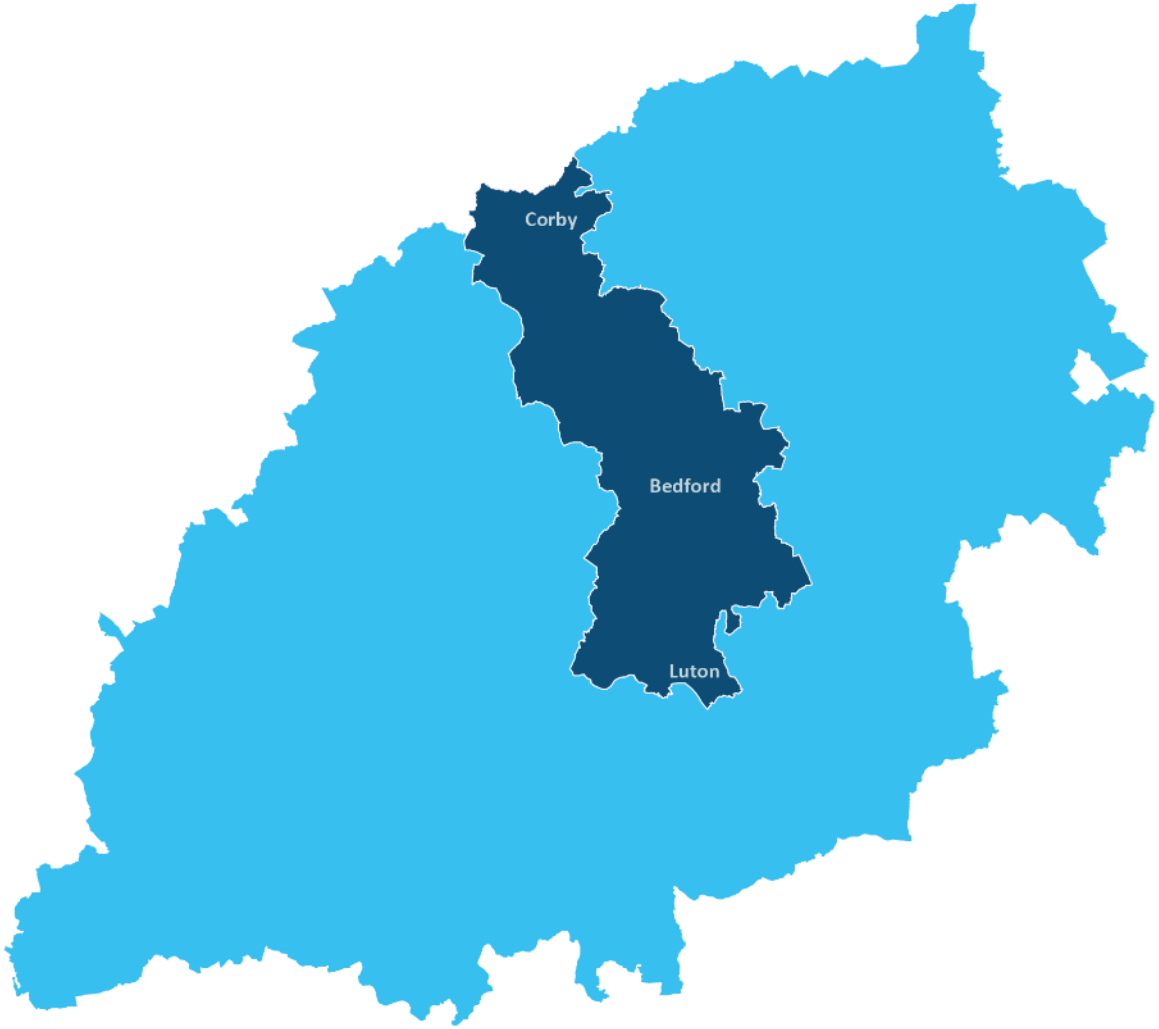
A summary of the highlighted strengths, weaknesses, opportunities, and challenges for the study area are provided below. As outlined, the study area faces significant challenges due to existing high levels of car dependency and a lack of good quality public transport and active travel connectivity within and between the settlements.

Strengths	Weaknesses
• With a total population of approximately 980,000, there is a large residential population that would directly benefit from enhanced inter and intra urban connectivity in the study area. • The EEH region is the heart of the UK's academic and commercial research sector, having a unique combination of scientific and cultural assets, resulting in a highly skilled workforce in the areas of innovation and technology. • Much of the study area has higher than average earnings comparative to the wider UK, notably to the north of Bedford. High income groups are more likely to take up 'high cost' solutions for decarbonisation, such as alternatively fuelled vehicles. • The North-South connectivity in the study area is relatively good for road and rail travel, with the Midland Main Line (MML) providing a rail corridor between the key settlements as well as to London and Sheffield. The A6 also offers a highway connection for north/south movements across the study area but varies between single and dual carriageway operation. • There are relatively high bus frequencies in the urban centres of Luton, Bedford and Kettering where services are more densely located.	• Car availability in the study area is high, particularly in the rural areas on the western and eastern peripheries. High car dependency leads to congestion, air quality issues and can lead to fuel poverty. There is a strong correlation between car availability and dependency. There has been a small increase in car/van availability across the study area between the 2011 and 2021 census. • There is an urban / rural divide in the distribution of Electric Vehicle charging points across the study area and an inconsistency in provision along the major road network. • At present, the journey time catchment of the private car to access key services is more than double that of public transport. For public transport to form a realistic alternative to driving, journey times must be comparable. • Future proposed transport interventions within the study area cover a range of transport modes, including road, rail, and air such as the London Luton Airport Expansion, East West Rail, and several highway bypass schemes. Future investment should be focused on prioritising active travel and public transportation / mass transit to reduce car dependency. • Lower levels of demand for bus and rail services threatens the commercial viability of existing services without public operational investment. Traditional commuter travel patterns are changing with an increasing proportion of people adopting hybrid working arrangements and only commuting a few days a week.
Opportunities	**Challenges**

- Significant improvement in east-west connectivity through development of East West Rail Phases 2 and 3, reducing pressure on A421/A428 corridor between Milton Keynes/Bletchley, Bedford and Cambridge.
- Targeted rural mobility interventions including strategic mobility hubs, shared and demand responsive transport, combined with improved rail and inter urban bus access offer opportunities for the study area. There are also opportunities to explore demand responsive services, car clubs and car sharing schemes.
- New mass rapid transit schemes could help to connect settlements which lack existing public transport or active travel connectivity.
- There is an opportunity to create a high-quality active travel network that is compliant to LTN 1/20 Design Guidance. The use of urban cycle priority schemes and conversion of disused rail lines into rural active travel routes present an opportunity to expand cycle networks.
- Micro-mobility solutions can form the first and last mile of a longer journeys being undertaken by public transport, thereby supporting a holistic transport network. An expansion micro-mobility options (e.g. to Luton and Bedford) would help to offer active travel options, especially for first mile / last mile movements.
- The most heavily used road freight routes in the study area run directly parallel to railway lines. This could mean that the removal of some of road freight onto rail links could be a realistic opportunity to decarbonise freight in the study area. EEH has the opportunity to support new inter-modal freight terminals along existing rail lines close to major strategic roads.
- There is an opportunity to decarbonise the transport network through new mobility solutions expansion of charging infrastructure for electric and alternative fuel vehicles.
- EEH could support the delivery of improved digital connectivity in the study area for areas with existing poor connectivity such as Milton Ernest. This would support digital accessibility and enable remote access to services and employment.

- At present, there is clear east-west severance within the study area. The delivery of East-West Rail will help to address the severance between the Midland Main Line and the East Coast Main Line. However, as a new railway the route selection for EWR Phase 3 will need to consider the range of current stakeholder positions.
- Rural communities between larger key settlements in the study area are located some distance from key services and workplaces, whilst also having less frequent public transport services. These factors drive continued car dominance.
- Much of the traffic in the study area is strategic through traffic travelling on the major road network between origins and destinations which lie outside of the study area, for example on the M1 and A1. This is a challenge as EEH is likely to have a lesser ability to influence these trips than if they were to either start or end within the area.
- In Luton, 8.6% of all transport carbon emissions are associated with “other sources”, which is likely attributable to Luton Airport. The balance between the economic importance of the airport and local air quality remains a challenge. Whilst EEH is unlikely to be able to influence emissions arising from the aviation industry, there may be opportunity to support the decarbonisation of surface travel to and from the airport.
- Car travel makes a substantial contribution to carbon emissions and on achieving net zero. Achieving net zero in the study area will be a significant challenge given the large residential population in smaller car-dependent communities and the high flow of strategic through traffic. Achieving net zero will require the uptake of zero emission vehicles which EEH could support through the role out of Electric Vehicle charging infrastructure.

10 Next Steps

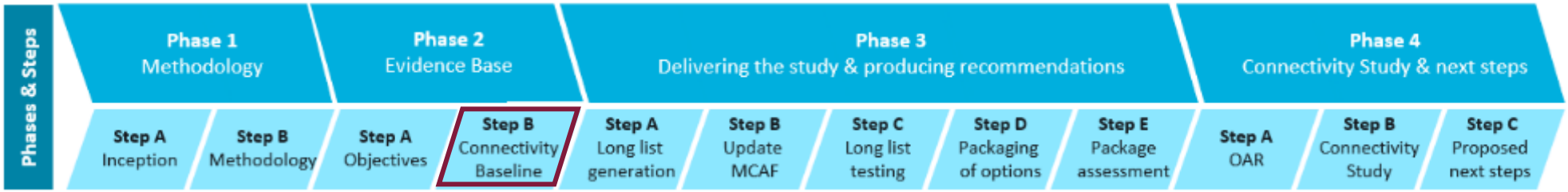


Overview

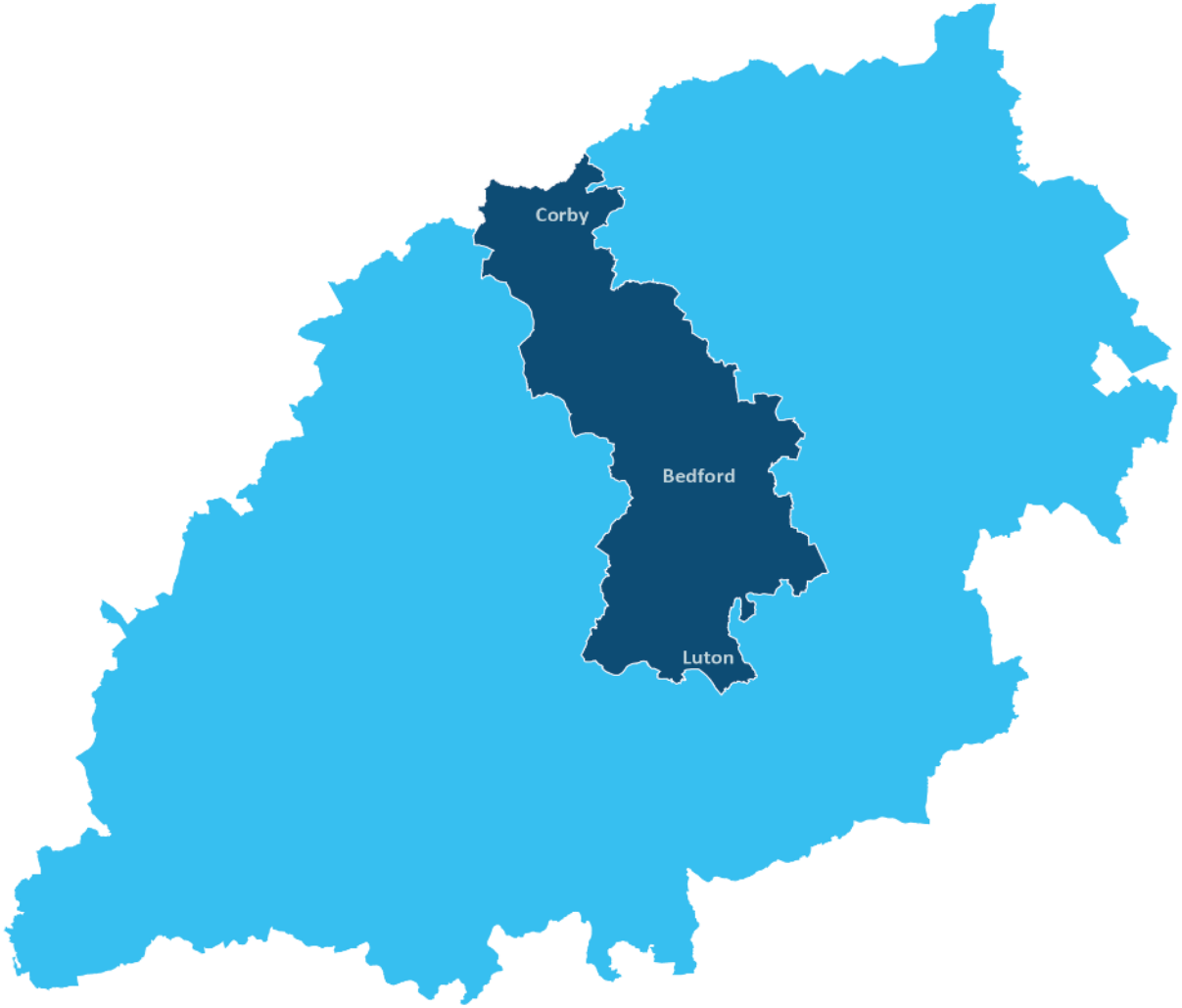
This report provides the evidence base that helps to set the scene for the identification of possible 'interventions' to improve transport services and infrastructure and or services in the study area.

Its findings will be used to inform a Long List of potential interventions that will be taken forward through a Multi-Criteria Assessment Framework (MCAF) process, leading to the selection of recommended interventions packaged together to form the basis of the Connectivity Study.

Figure 10-1 Connectivity Study development process



Appendices



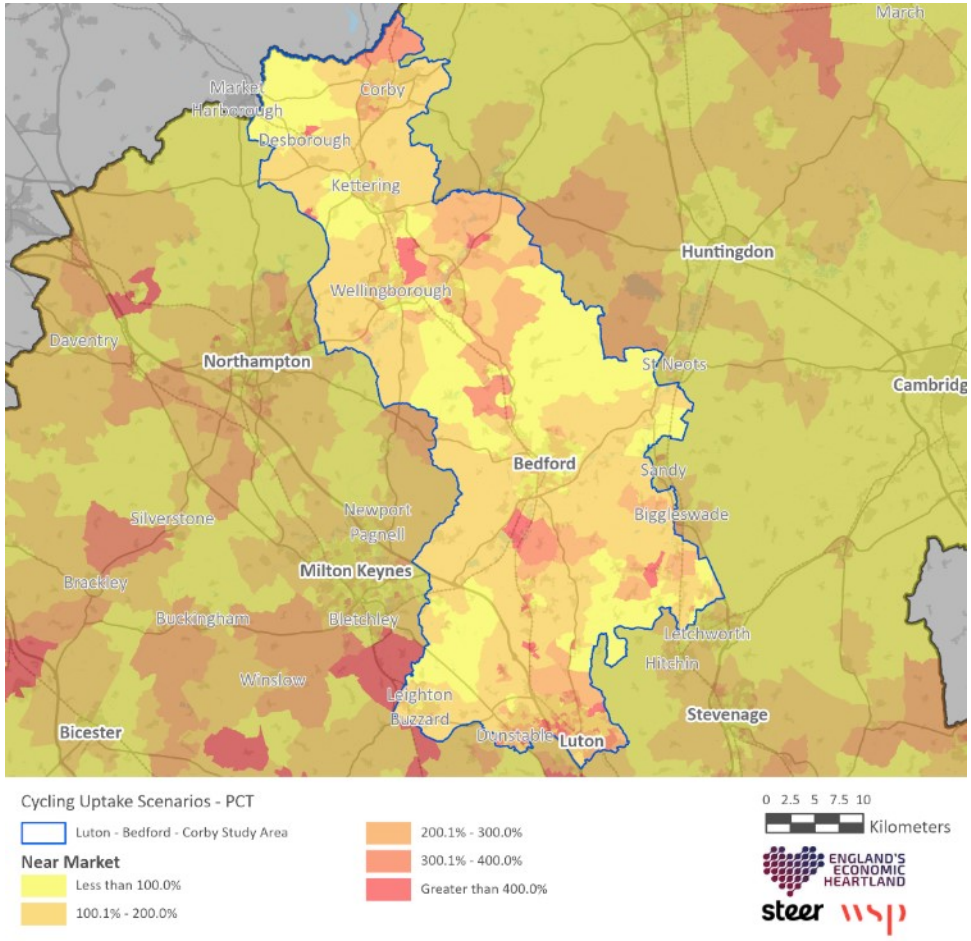
Appendix A – Mosaic Groups

Mosaic Group	Description
City Prosperity	City dwellers are characterised by living in central locations and pursuing careers with high rewards. Likely to be married couples, in managerial / senior positions, supporting students or older children, and are used to using online services
Prestige Positions	They are characterised by living in a high value detached home, being employed in managerial or senior positions and supporting students/older children.
Country Living	These residents are characterised as well-off owners in rural locations enjoying the benefits of country life. High car ownership and high levels of internet use.
Domestic Success	They are characterised as thriving families who are busy bringing up children and following careers. They are likely to have children and own new technology.
Suburban Stability	This persona is characterised by living in a suburban mid-range home, which they've lived in for several years with older children.
Aspiring Homemakers	They are characterised as younger households, in full time employment, settling down in housing priced within their means, which may be in the suburbs.
Urban Cohesion	They are characterised as residents of settled urban communities with a strong sense of identity. They are likely to be multicultural and reside in the suburbs. Younger family members are likely to have an interest in new technology.
Rural Reality	This persona is characterised by householders living in inexpensive homes in village communities or outlying houses. Experience slower internet speeds.
Transient Renters	This persona is characterised by single people privately renting low-cost homes, often in terraced housing, for the short term.
Modest Traditions	This persona typically lives in smaller terraced properties located in the outskirts of urban areas. They tend to be composed of couples with no children (or with children who have left home). They are quite likely to have access to a car.
Rental Hubs	This persona is characterised by educated young people privately renting in urban neighbourhoods. They are likely to be single or sharing accommodation. They have high smart phone use.
Senior Security	They are characterised by being elderly and who are enjoying a comfortable retirement. These more elderly households have lower mileage and less likely to take up new technology.
Family Basics	These families are characterised as those with limited resources who have to budget to make ends meet. Likely to have children, limited resources. squeezed budgets.
Municipal Challenge	They are characterised by mature residents living in affordable suburban housing.
Vintage Value	This persona is characterised by people living alone, in small homes or flats, on low income and need of support.

Appendix B – Cycling uptake scenarios

Near Market Scenario

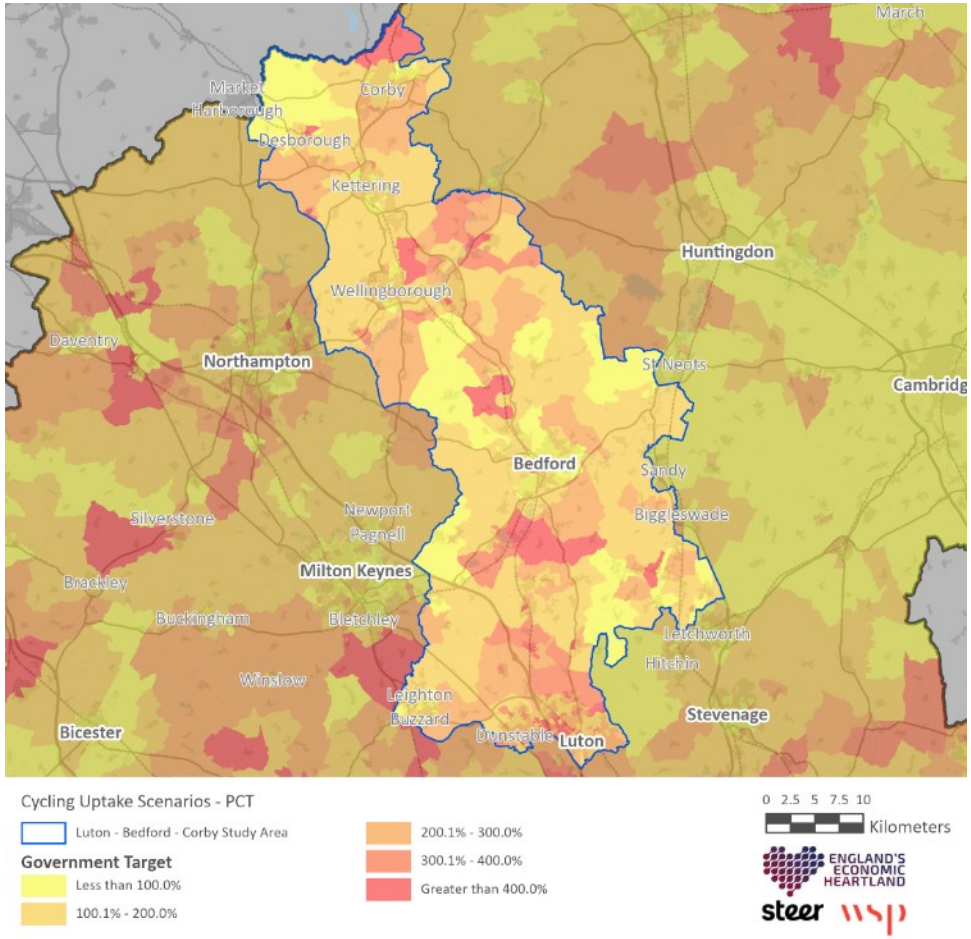
This map shows the level of change in cycling between the current situation and a scenario that reflect the government's target to double cycling levels by 2025. It models the overall doubling of cycling as a function of trip distance and hilliness plus various sociodemographic and geographical characteristics (including age, sex, ethnicity, car ownership, and income deprivation) that are currently associated with propensity to cycle commute in England and Wales.



Data Source: Propensity to Cycle Toolkit

Government Target Scenario

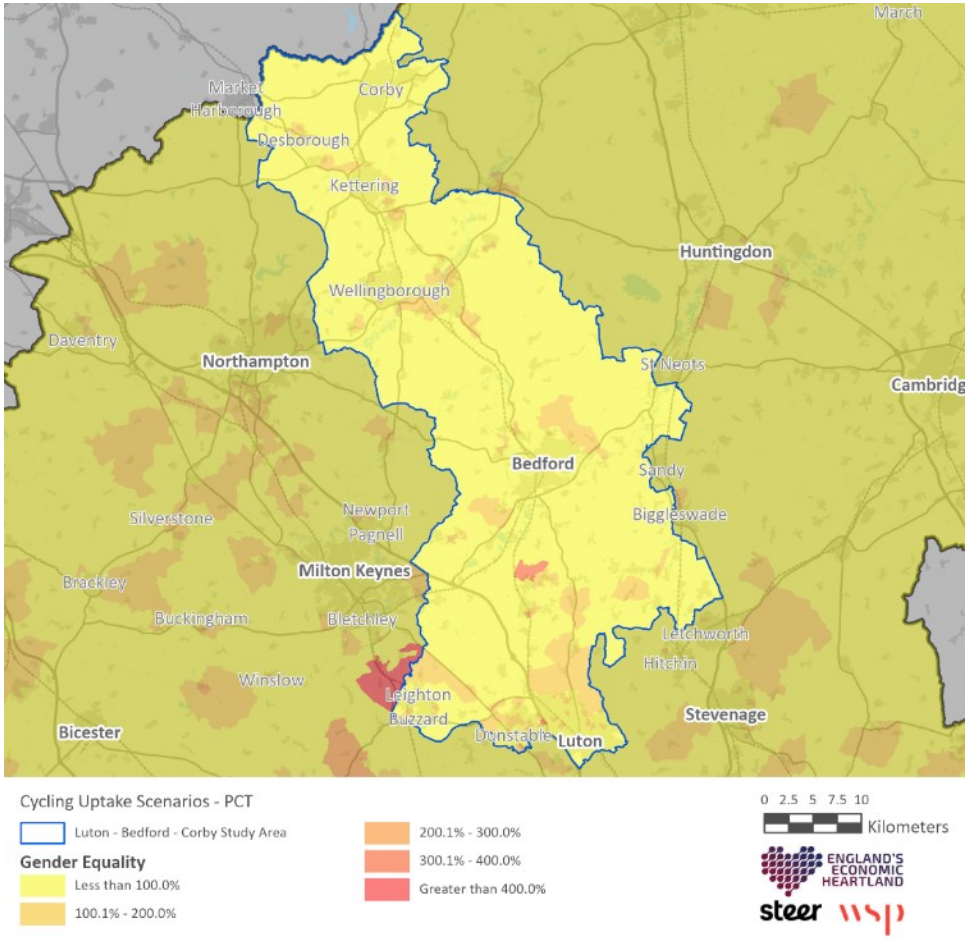
This map shows the level of change in cycling between the current situation and a scenario that reflect the government's target to double cycling levels by 2025. It models the overall doubling of cycling as solely a function of trip distance and hilliness.



Data Source: Propensity to Cycle Toolkit

Gender Equality Scenario

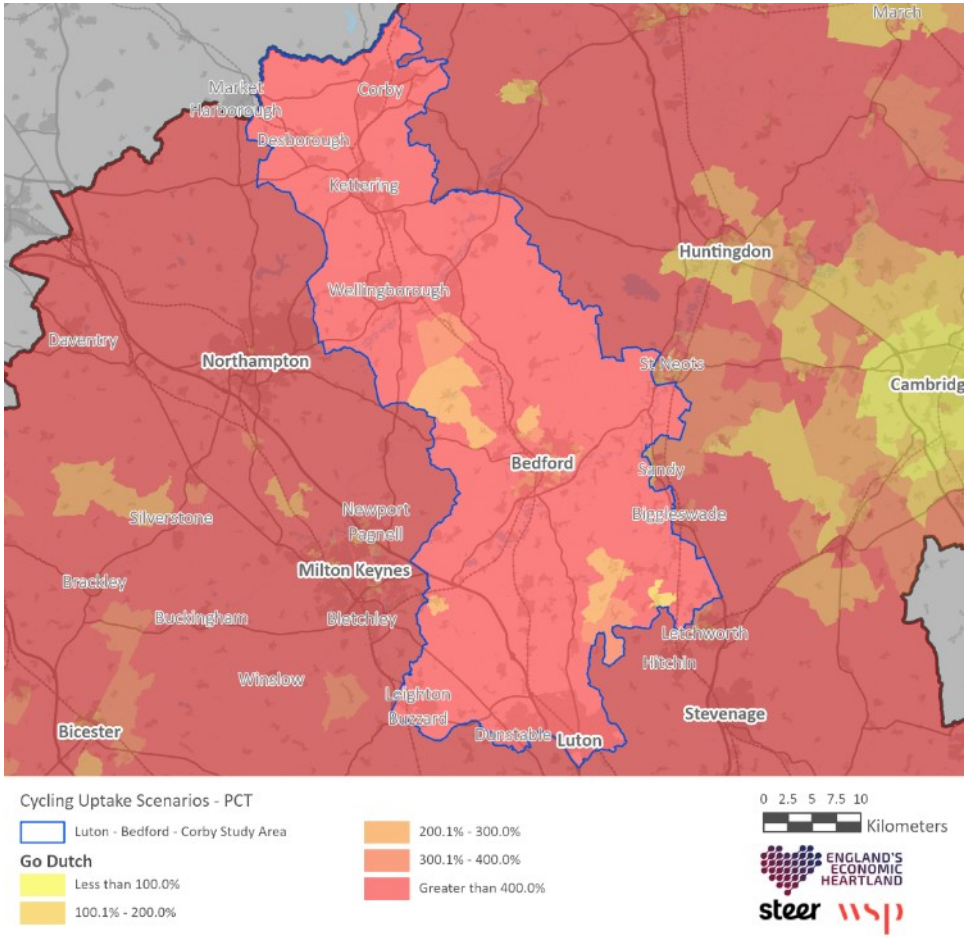
This map shows the level of change in cycling between the current situation and a scenario where gender disparities are eliminated.



Data Source: Propensity to Cycle Toolkit

Go Dutch Scenario

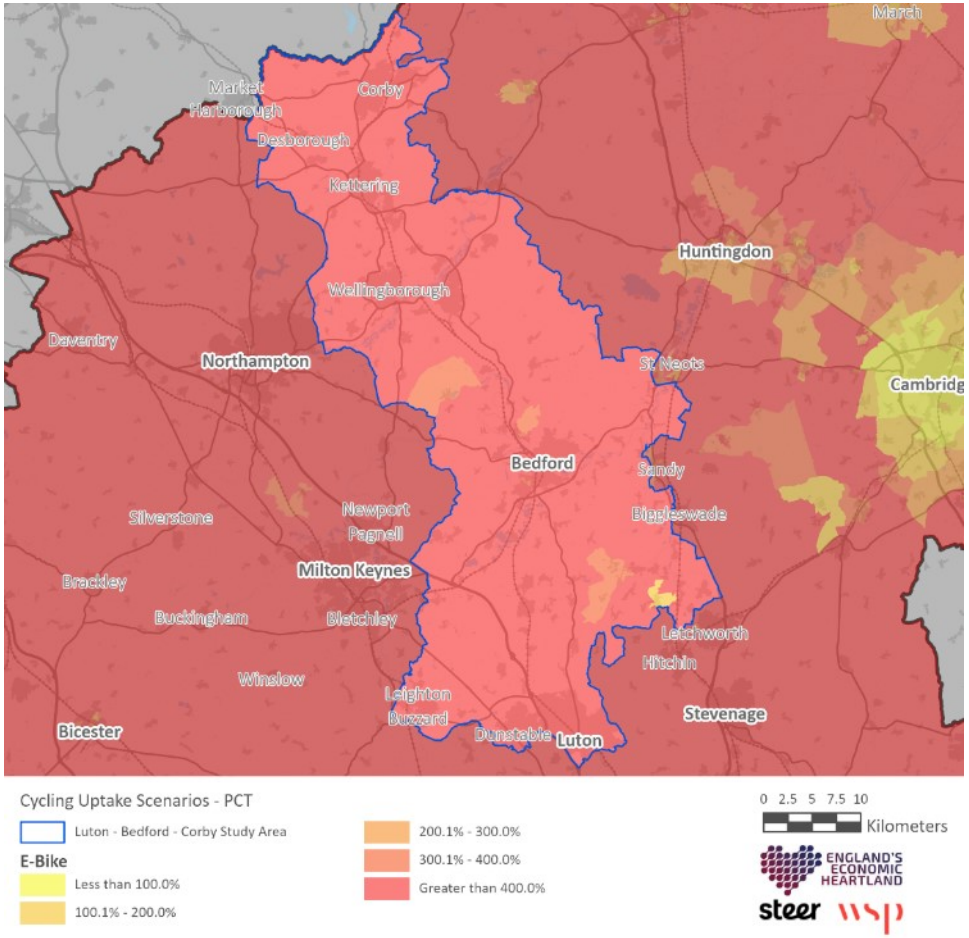
This map shows the level of change in cycling between the current situation and a scenario based on cycling records from the Netherlands, whilst still considering local geography.



Data Source: Propensity to Cycle Toolkit

E-Bikes Scenario

This map shows the level of change in cycling between the current situation a scenario where there is the widespread uptake of electric cycles.



Data Source: Propensity to Cycle Toolkit

Appendix C – Mode of Travel Origin – Destination Matrices

Key:

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Car / Van Driver

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	7481	3	40	350	924	7	148	168	49	18	211	41	5619	933	15059	18182	3123	922
Bishops Stortford	2	2612	90	20	7	227	1	53	39	128	26	149	1675	1176	5029	5615	586	4355
Hatfield	6	8	1602	153	8	46	10	86	618	254	141	952	1380	1066	5264	5580	316	351
Hemel Hempstead	189	6	415	8799	102	40	87	583	1199	169	1961	329	5813	2545	19692	20696	1004	905
High Wycombe	400	1	21	86	8074	6	4	47	23	17	103	27	7072	2720	15881	16981	1100	3523
Hoddesdon	4	104	136	50	3	2027	0	21	80	157	43	316	3205	2212	6146	6347	201	1517
Leighton Buzzard	500	1	52	500	53	9	2746	860	107	49	157	49	1534	417	6617	10506	3889	339
Luton	114	4	793	1372	61	131	399	23263	986	850	586	437	4173	2773	33169	41204	8035	1354
St Albans	30	16	1087	765	47	67	18	638	4975	379	790	1052	3467	2200	13331	14547	1216	820
Stevenage	8	58	951	170	18	247	17	446	404	9641	195	1665	3418	1619	17238	20631	3393	1075
Watford	79	7	405	1051	111	26	21	380	822	230	9120	320	6417	7710	18989	20283	1294	1323
Welwyn Garden City	8	23	1479	180	9	147	5	151	643	607	169	3762	2289	1318	9472	10099	627	533
Rural Area	5658	1048	3761	5322	8384	3055	1039	5238	5716	4393	7305	5720						
London	300	228	1668	1476	1272	936	70	1556	1497	908	5165	1460						
Corridor total	14479	3891	10832	18818	17801	6035	4495	31934	15661	16892	20807	14819						
EEH	18248	4226	12599	20828	19674	6530	6560	44991	17338	23907	22437	17541						
EEH Excluding Corridor	3769	335	1767	2010	1873	495	2065	13057	1677	7015	1630	2722						
England and Wales	682	3835	1346	1718	3432	2199	220	4967	878	1537	2281	1444						

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Car / Van Passenger

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	951	0	0	18	54	0	11	3	5	1	6	2	466	46	1517	1721	204	33
Bishops Stortford	0	313	1	1	0	6	0	2	1	4	1	5	78	51	412	429	17	242
Hatfield	0	0	228	4	1	2	0	2	96	14	11	133	136	65	627	645	18	50
Hemel Hempstead	5	0	13	1234	5	1	6	15	70	3	91	13	416	112	1872	1912	40	28
High Wycombe	23	0	1	2	1121	0	0	1	2	1	2	0	584	105	1737	1794	57	172
Hoddesdon	0	4	3	1	0	191	0	1	4	7	1	9	262	123	483	488	5	109
Leighton Buzzard	18	0	0	26	4	0	326	57	3	1	8	1	83	14	527	745	218	15
Luton	18	0	240	361	3	38	58	3627	81	138	41	47	574	229	5226	6395	1169	177
St Albans	0	1	48	23	0	3	0	25	549	14	28	38	182	76	911	953	42	10
Stevenage	1	2	72	6	2	2	0	23	17	1442	9	122	251	76	1949	2145	196	78
Watford	2	0	20	58	0	0	0	14	43	6	990	12	453	317	1598	1648	50	38
Welwyn Garden City	0	0	140	2	0	2	0	7	32	42	8	531	142	63	906	929	23	24
Rural Area	346	84	190	306	577	186	77	292	381	241	516	312						
London	15	22	79	61	51	54	6	67	49	31	237	78						
Corridor total	1364	404	956	2042	1767	431	478	4069	1284	1914	1712	1225						
EEH	1537	421	1029	2115	1819	446	605	4860	1361	2317	1782	1337						
EEH Excluding Corridor	173	17	73	73	52	15	127	791	77	403	70	112						
England and Wales	29	281	58	66	138	142	10	560	61	83	122	39						

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Bus, Minibus and Coach

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	890	0	0	11	63	0	8	9	0	0	1	0	342	28	1324	1487	163	18
Bishops Stortford	0	90	2	1	0	2	0	1	1	4	1	1	44	48	147	151	4	328
Hatfield	0	1	182	17	2	9	0	5	210	32	16	171	186	165	831	851	20	38
Hemel Hempstead	9	0	28	815	3	1	1	16	113	5	198	7	200	253	1396	1418	22	20
High Wycombe	45	0	0	3	1303	1	0	0	1	0	1	0	674	106	2028	2073	45	150
Hoddesdon	0	5	1	0	0	79	0	0	1	1	0	4	186	69	277	280	3	28
Leighton Buzzard	31	0	0	0	0	0	65	53	0	0	0	0	15	34	164	258	94	5
Luton	7	0	59	120	2	1	53	4171	45	85	39	20	379	260	4981	5751	770	136
St Albans	0	1	137	51	0	0	0	8	419	18	45	57	181	65	917	941	24	15
Stevenage	0	0	50	6	0	1	0	20	26	1848	8	74	115	60	2148	2288	140	45
Watford	0	0	32	93	2	0	0	17	85	17	1239	9	547	370	2041	2117	76	45
Welwyn Garden City	0	0	174	7	0	5	0	7	60	38	7	313	82	26	693	703	10	11
Rural Area	303	47	124	198	557	106	29	282	380	160	540	178						
London	22	13	183	120	70	67	4	197	100	72	809	168						
Corridor total	1285	144	789	1322	1932	205	156	4589	1341	2208	2095	834						
EEH	1418	148	843	1347	1969	206	223	5223	1404	2405	2181	849						
EEH Excluding Corridor	133	4	54	25	37	1	67	634	63	197	86	15						
England and Wales	32	143	64	46	127	36	4	552	42	70	242	56						

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Train

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	39	0	0	3	44	0	0	2	0	0	5	0	121	870	214	249	35	31
Bishops Stortford	0	50	2	0	0	5	0	8	2	4	1	5	48	2457	125	221	96	405
Hatfield	0	0	33	3	0	2	1	1	10	43	7	90	55	817	245	278	33	22
Hemel Hempstead	3	0	3	79	1	0	2	6	9	3	112	4	83	1903	305	355	50	44
High Wycombe	25	0	0	0	51	0	0	0	1	0	1	1	122	1471	201	233	32	80
Hoddesdon	0	10	1	3	0	37	0	1	0	1	1	4	112	1792	170	182	12	33
Leighton Buzzard	3	0	5	18	1	0	34	14	4	2	70	2	39	1207	192	403	211	43
Luton	2	0	22	18	1	2	7	593	228	14	15	16	209	3231	1127	1414	287	109
St Albans	1	1	14	13	1	1	0	106	147	11	84	13	108	6759	500	578	78	114
Stevenage	1	1	40	3	1	1	0	4	8	122	6	87	116	2041	390	587	197	72
Watford	1	0	15	37	4	4	0	6	50	13	418	10	223	4579	781	876	95	134
Welwyn Garden City	0	0	23	7	0	1	0	2	5	46	3	67	59	1836	213	250	37	36
Rural Area	102	57	74	71	147	108	13	117	199	187	228	168						
London	72	53	439	160	199	168	10	483	332	307	1331	624						
Corridor total	177	119	232	255	251	161	57	860	663	446	951	467						
EEH	213	154	339	307	313	173	97	1359	796	1145	1137	730						
EEH Excluding Corridor	36	35	107	52	62	12	40	499	133	699	186	263						
England and Wales	23	202	89	119	52	64	9	291	76	77	247	94						

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Cycling

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	632	0	0	6	5	0	3	0	0	1	0	0	112	9	759	792	33	19
Bishops Stortford	0	146	0	0	0	2	0	0	0	0	1	1	29	6	179	180	1	41
Hatfield	0	0	258	2	0	0	0	4	50	1	2	58	68	18	443	449	6	16
Hemel Hempstead	1	0	3	313	1	0	0	2	8	1	18	0	99	24	446	454	8	10
High Wycombe	0	0	0	0	274	0	0	0	0	0	0	0	97	13	371	379	8	15
Hoddesdon	0	0	0	0	0	132	0	0	0	0	0	0	83	22	215	217	2	20
Leighton Buzzard	6	0	0	4	2	0	283	11	0	1	0	0	20	2	327	355	28	5
Luton	1	0	3	8	0	0	3	921	3	5	3	2	55	11	1004	1120	116	16
St Albans	0	0	65	8	0	0	0	8	490	5	18	13	94	34	701	712	11	9
Stevenage	0	0	8	2	0	2	0	5	3	830	2	12	52	18	916	943	27	38
Watford	0	0	5	15	1	0	0	3	17	4	766	1	231	121	1043	1060	17	24
Welwyn Garden City	0	0	98	3	0	1	0	0	12	5	3	479	50	11	651	654	3	9
Rural Area	131	11	69	61	90	57	25	66	100	82	184	81						
London	1	4	12	12	6	11	1	10	10	13	37	9						
Corridor total	771	157	509	422	373	194	314	1020	683	935	997	647						
EEH	795	163	518	429	379	195	342	1192	696	1033	1012	652						
EEH Excluding Corridor	24	6	9	7	6	1	28	172	13	98	15	5						
England and Wales	10	32	33	20	37	29	1	90	20	33	38	16						

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Walking

Major Urban Settlements	Aylesbury	Bishop's Stortford	Hatfield	Hemel Hempstead	High Wycombe	Hoddesdon	Leighton Buzzard	Luton	St Albans	Stevenage	Watford	Welwyn Garden City	Rural Area	London	Corridor total	EEH	EEH Excluding Corridor	England and Wales
Aylesbury	4354	0	2	4	17	0	2	3	0	0	2	1	283	43	4668	4791	123	70
Bishops Stortford	0	1779	1	0	0	6	0	0	0	2	2	4	79	40	1873	1877	4	91
Hatfield	1	1	1862	4	2	1	0	4	22	7	9	62	123	66	2098	2121	23	103
Hemel Hempstead	1	0	3	3634	1	0	2	4	22	4	21	1	255	29	3948	3975	27	66
High Wycombe	13	0	0	9	3860	0	0	4	1	0	3	3	306	59	4199	4232	33	106
Hoddesdon	0	9	0	0	0	862	0	1	1	5	2	3	185	31	1068	1072	4	42
Leighton Buzzard	7	0	3	19	2	0	1749	37	1	1	3	1	57	13	1880	1964	84	14
Luton	5	0	14	26	6	4	20	10289	23	21	12	7	137	106	10564	10889	325	151
St Albans	0	1	6	13	0	0	0	4	3149	6	18	5	153	49	3355	3386	31	56
Stevenage	0	2	5	5	0	0	1	9	15	3324	27	14	106	30	3508	3561	53	90
Watford	1	0	18	21	1	1	1	10	34	38	5876	12	498	151	6511	6559	48	79
Welwyn Garden City	0	2	62	3	0	1	0	1	11	12	10	2158	83	21	2343	2352	9	32
Rural Area	225	60	207	169	259	127	39	99	207	72	435	126						
London	13	5	21	36	25	15	2	48	29	31	69	32						
Corridor total	4607	1854	2183	3907	4148	1002	1814	10465	3486	3492	6420	2397						
EEH	4746	1861	2221	3927	4187	1008	1915	10984	3526	3592	6457	2428						
EEH Excluding Corridor	139	7	38	20	39	6	101	519	40	100	37	31						
England and Wales	62	67	87	69	117	31	14	409	61	79	161	48						

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Appendix D – Source list

Evidence Type	Source
Settlement Population 2021	2021 Population data, 2022 Built Urban area geography boundary
Population, employment & employees in key urban settlements in study area	ONS 2021 Census population and ONS Business Register and Employment Survey 2021
Resident Population	2021 Census
Population Growth	2011 & 2021 Census
Type of Resident	Segmentation Portal
Propensity to Travel (By Mode)	First Mile Last Mile Strategy for England's Economic Heartland, 2020
Workplace Population	2021 Census
Average earning	Income estimates for small areas, England & Wales, 2020
Indices of Multiple Deprivation	English Indices of Deprivation 2019
Car and Van Availability	2021 Census QS416EW Car or Van Availability
Health & Disability Decile	2021 Census
Road Safety – All Vehicles	DfT Road Safety Data 2017 - 2021
Road Safety – HGVs	DfT Road Safety Data 2016 - 2020
Carbon Emissions	UK Local Authority and Regional Carbon Emissions 2020
Flood Risk	Environmental Agency
Protected and Vulnerable Areas	Natural England, Historic England, Environmental Agency
Air Quality Management Areas (AQMAs)	DEFRA AQMAs 2023
Housing Affordability	House Price statistics for Small areas (HPSSAs), Dataset 2Median Price paid by MSOA (2020)

Evidence Type	Source
Industry Split	Business Register and Employment Survey (2020)
Gross Value Added	ONS - Regional gross value added (balanced) by industry: local authorities by ITL1 region
Average Download Speeds	OFCOM Connected Nations 2023 Report Performance Data
Active Travel Network	SUSTRANS (2023)
Shared Mobility Supplier	Zipp, Voi, Santander, Lime, Tier, Ginger, BikeSharingWorldMap (2023)
Cycling Propensity (active travel mode share)	2011 Census: Method of Travel to Work
E-bike Catchment	Open Route Services (2023)
Rail Network	Open Street Map
Railway Station Usage	DfT Station Exists and Entries
Bus Network	Basemap Bus Route Lines (Q1 2022)
Public Transport and Walking times to key services	DfT Journey Time Statistics (2019)
Drive time and Public Transport catchments	TRACC / ESRI Speed Profile Data (2019)
Freight Traffic	UK Government – GB Road Traffic Counts (2021)
Electric Vehicle Charge Points	National Charge Point Registry (2023)
Commuting trips within the study area	Census 2011 - WU03EW - Location of usual residence and place of work by method of travel to work
Mode Share by Settlements	2011 Census: Method of Travel to Work
Residential Sites	EEH Databank
Forecast Population Growth	TEMPro, 2021 Census - Population
Future Transport Schemes	Local Authority Major Transport Schemes, Highways England RIS 2, Network Rail's 2019-2024 Delivery Plan