ENGLAND'S ECONOMIC HEARTLAND

Swindon – Didcot – Oxford
Connectivity Study

[Styled cover image to be provided by EEH]

Final Report FINAL DRAFT

June 2023 v1.1

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Overview

England's Economic Heartland (EEH) is the sub-national transport body responsible for bringing together local transport authorities in a strategic partnership for the region extending from Swindon to Cambridgeshire and Peterborough and North Northamptonshire to Hertfordshire. We work with our partners to provide leadership on strategic infrastructure.

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.

Based on the **requirement to achieve net zero by 2050 at the latest**, and an ambition to reach this by 2040, we are also working to support delivery of a net zero transport network and our strategy sets out that we will work with infrastructure owners and operators to ensure that proposals brought forward for the development of the transport system reduce reliance on the private car.

Advancing on the Transport Strategy is a **programme of Connectivity Studies** to examine key study areas across the region in detail with the aim of identifying a preferred package of multimodal infrastructure, service, or policy interventions to help achieve the Transport Strategy objectives.

Each of EEH's connectivity study areas were decided based on an evidence-based assessment of the connectivity challenges and opportunities against our transport strategy principles in defined areas suggested during stakeholder engagement as part of our Outline Transport Strategy consultation.

As shown in Figure 1 this **"Swindon – Didcot – Oxford Connectivity Study**" is the third in the programme and examines the area comprising the triangle connecting Oxford and Swindon with large settlements including Didcot, Abingdon, Farringdon, and Wantage.

The area is home to Oxford University, one of the world's preeminent universities, and many world class business clusters, science parks and innovation hubs, including Harwell Science and Innovation Campus to the south west of Didcot and the Culham Science Centre to the east of Abingdon.
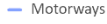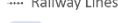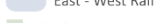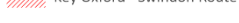
The study area encompasses regional and strategic road and rail links, including the M4 (London - South Wales via Swindon), A34 (Southampton to accessing the midlands via Didcot, Oxford, A420 (Swindon to Oxford), A4142 (Oxford Eastern By-Pass Road) and A419 (Swindon M4 junction 15 to Gloucester M5 junction 13) as well as the Cherwell Valley Line and Great Western Main Line. There are no international gateways situated within or on the edge of the study area. However, both the A34 and Cherwell Valley line transport significant flows of freight between Southampton and the Midlands.

Projects already underway or committed (such as East West Rail Phase 1 and Oxford Railway Station upgrades) are factored into the study, with the assessment process and final recommended packages of interventions focused on what further interventions may be needed.

Development of this study was developed by EEH, supported by a consultancy team led by Steer, with WSP, 5th Studio and DMS Research and Consulting – collectively (collectively the 'project team').

Figure 1: Study Area

Figure 1: Study Area
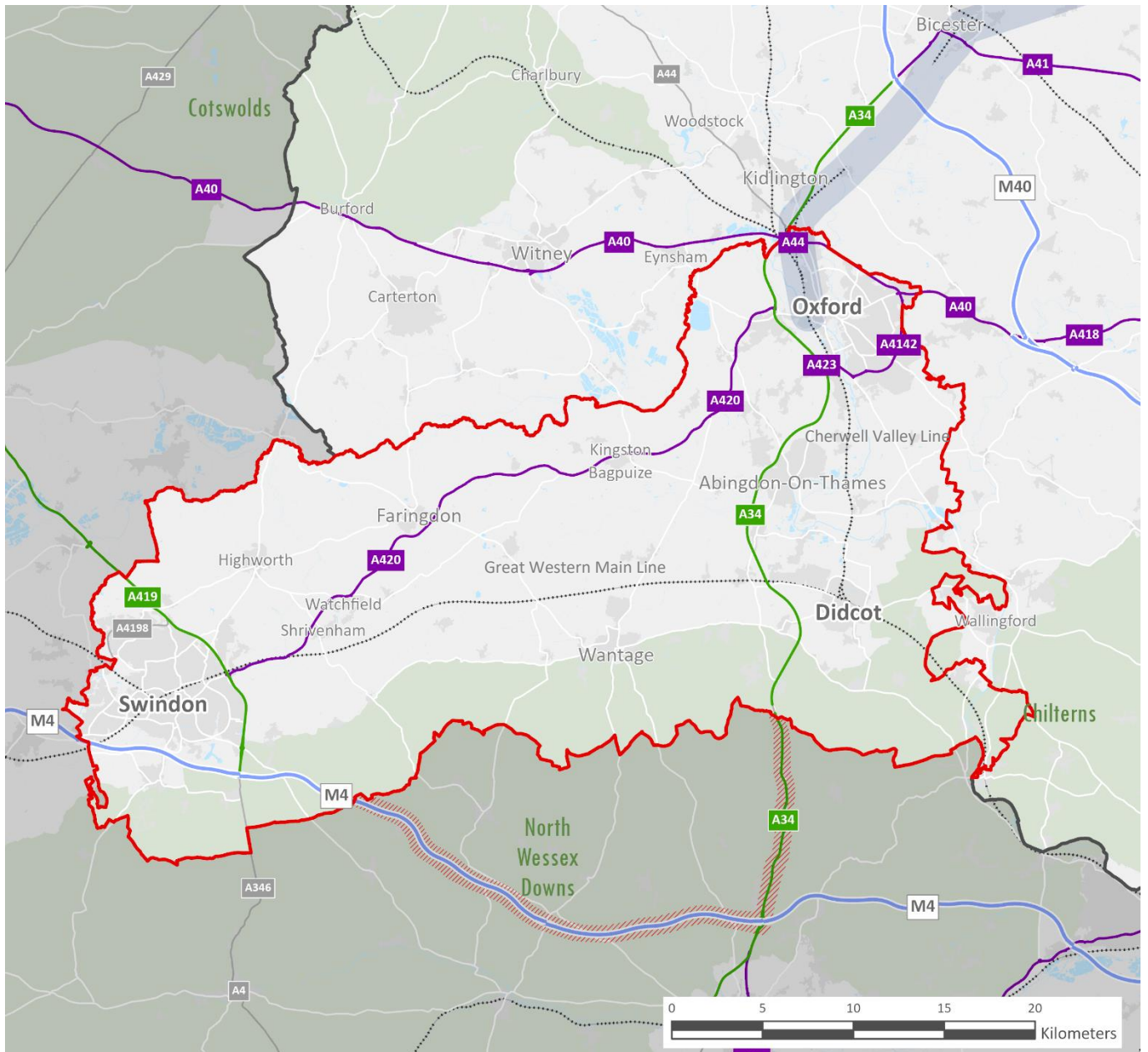
Legend:
- EEH Study Area
- Swindon - Didcot - Oxford Study Area
- Motorways
- SRN
- MRN
- Main Roads
- Railway Lines
- East - West Rail
- AONB
- Key Oxford - Swindon Route

Study Aims

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

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

2. Improving quality of life and wellbeing through a safe and inclusive transport system accessible to all which emphasises sustainable and active travel.

3. Supporting the regional economy by connecting people and businesses to markets and opportunities.

4. Efficient movement of people and goods through the region and to international gateways.

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

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

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

The overall method is summarised in Figure 2 below.

Stakeholder Engagement

Development of the transport strategy involved comprehensive engagement, including two rounds of public consultation, capturing the views of our partners, stakeholders, interest groups, businesses and residents.

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

In particular, the process highlighted increased acceptance of the need for change and the need to do so at pace, particularly with regards to decarbonisation.

Within this connectivity study, stakeholder engagement and connectivity evidence was gathered through the following forums:

- **Steering group:** Virtual workshops with local authority planning, local enterprise partnerships and transport officers, alongside National Highways and Network Rail to gain local insights into connectivity issues and opportunities.

- **Stakeholder group:** Virtual workshops were undertaken with transport, place, and environmental stakeholder groups to gather insights on issues and opportunities and potential solutions. Topic specific one-to-one discussions were also held.

- **Call for evidence:** Gathering of further insights through an online survey, providing the opportunity for wider participation from members of the public businesses and interest groups in identifying key connectivity issues in the study area and potential interventions.

- **Expert panel:** An expert panel of public transport, active travel, road, and freight experts were engaged to capture any additional connectivity opportunities.

Figure 2: Study Method

Phases & Steps											
Phase 1 Methodology		**Phase 2** Evidence Base			**Phase 3** Delivering the study & producing recommendations						**Phase 4** Connectivity plan & next steps	

| Step A Inception | Step B Method | Step A Connectivity Baseline | Step B Objectives | Step C Infrastructure Scenarios | Step A Long list generation | Step B MCAF | Step C Long list testing | Step D Packaging of options | Step E Package assessment | Step F OAR | Step A Connectivity Plan | Step B Proposed next steps |

Deliverables

- ✅ Inception note
- ✅ Project Delivery Plan

- ✅ Connectivity baseline
- ✅ Agreed study objectives
- ✅ Reviews of existing/interdependent studies
- ✅ Agreed optimal Infrastructure Scenario

- ✅ Long list of potential interventions
- ✅ Agreed MCAF
- ✅ Package(s) of interventions for review by steering/stakeholder groups
- ✅ Recommended packages of interventions, including rationale

- ✅ Connectivity Study – written report (Connectivity plan)
- ✅ Proposed next steps

Activities

- Project Inception Meeting
- Confirm Methodology and Project Delivery Plan
- Initial articulation of study objectives and the strategic questions

- Develop an understanding of connectivity baseline
- Set study objectives, strategic objectives and Critical Success Factors
- Determine a set of possible future Infrastructure Scenarios

- Collation of long list of potential interventions for the study area
- Development of the Multi-Criteria Assessment Framework (MCAF)
- Test interventions against the agreed criteria in the MCAF

- Develop packages of interventions.
- Sense check packages against objectives, strategic objectives and Critical Success Factors
- Summarise analytical work undertaken in an Option Assessment Report (OAR)

- Present packages of interventions for improving connectivity in the study area
- Identify next steps

Engagement

Steering Group 1
- Confirmation of study area
- Agreement of Study Objectives

Steering Group 2 / Stakeholder Group 1
- Identification of key study area issues
- Mapping of opportunities and possible interventions
- Refinement of scenarios

Steering Group 3 / Stakeholder Group 2
- Check & Challenge interventions
- Review of MCAF score summaries

Steering Group 4
- Review of EEHELUM results
- Final reporting Check & Challenge

Culham Railway Station (Steer)

About the Study Area

The study area (see Figure 1 on Page 4 above) is an attractive place to live, exhibiting diverse social characteristics, a strong economy and with relatively good transport connectivity. However, the nature of the study area results in complex social, economic and connectivity challenges to be addressed and opportunities to be maximized.

Containing some of the Heartland's most important economic assets including the key settlements of Oxford, Didcot and Swindon as well as the Science Vale, and University of Oxford – the number one ranked university in the world.

The area is anticipated to reach **an expected population by 2049 of 880,000 residents and 370,000 jobs with a 43% reduction in emissions** from 290 KTCO$_2$e per annum to 170 KTCO$_2$e per annum – falling short of the target to reach net zero by 2050 at the latest and the ambition to reach this by 2040.

The study area has experienced and will experience significant change, with substantial levels of growth planned in Abingdon, Faringdon, Wantage and South Swindon. Recent growth has been concentrated around the centre of Oxford, around Didcot, and West of Highworth.

There are significant opportunities and potential for investment in transport that can not only help support economic growth and levelling-up but also improve air quality, safety, health and wellbeing, support biodiversity net gain and contribute to net zero emissions requirements.

Where people live

The study area has a **population of approximately 550,000 residents**. The majority of the population is located within the settlements of Oxford (167,500 residents) and Swindon (199,500 residents), with smaller pockets concentrated in the settlements of Abingdon-on-Thames (40,000), Didcot (34,000), and Wantage and Grove (20,000). This is expected to grow to 880,000 by 2049 under the business-as usual projection.

The centre of the corridor contains more isolated smaller settlements (including Wantage, Highworth and Faringdon) that along with the numerous rural village and hamlet communities, are dependent on the larger towns for employment and access to some key services.

Between 2011 and 2020 the study area population grew by 7%. Across the study area, the largest levels of growth were observed in the centre of Oxford, South Didcot, and West of Highworth. Forecasts for future population growth indicate notable increases surrounding Abingdon, Faringdon, Grove and Wantage as well as south of Swindon with notable development sites proposed.

Key challenges:

- The population is predominantly located in the east and west of the study area with a relatively sparse central region. This results in high levels of car dependency as active travel is often unfeasible due to distance and other factors, and public transport services are much less likely to be commercially viable.

- Population growth between 2011 and 2020 (as well as future forecasts) has been concentrated around the edge of urban areas. These areas are longer distances from everyday services and amenities and are often less well connected by active and public transport.

Where people work

The study area contains some of EEH's most important economic assets, including the University of Oxford and Oxford Brookes University, Oxford Science Park, Oxford Business Park, Milton Park, Harwell Science and Innovation Campus and Culham Science Centre.

The study area has a **total workplace population of 315,500 which is expected to grow to 370,000 by 2049**. The highest concentration of workers is found in Swindon and Oxford, with large concentrations also found in the larger settlements of Abingdon-on-Thames and Didcot and number of large rural employment sites such as Harwell and Culham.

The distribution of employment opportunities across the study area result in a number of distinct travel-to-work catchment areas: Oxford-Abingdon-Didcot in the east and Swindon-Wroughton-Highworth in the west. This is complemented by a complex pattern of small flows within the largely rural centre of the study area.

Key challenges:

- The presence of large rural employment sites results in high levels of car dependency as active travel is not viable and public transport connections are limited to nearby urban settlements.

- The spatial distribution of jobs across the main towns, villages and rural locations means there is a need for a package of connectivity measures that enables sustainable access within and into the main settlements, but also between the smaller towns and isolated rural employment sites.

- Historic travel-to work catchment areas suggest that the existing transport network may not fully support east-west commuting journeys within the study area.

Community diversity

The study area is economical and socially diverse. There is a clear urban / rural divide with rural areas on average having much lower levels of deprivation compared to urban areas. Parts of the corridor experience some of the highest levels of deprivation, with rural deprivation exacerbated for those not able to drive to access key services. This includes pockets in **Swindon and Oxford which are classified as being in the 10% most deprived areas in England**.

Levels of deprivation are also closely aligned with average household incomes. The average household income is the study areas is £51,000; however, there is substantial variation across the urban and rural communities. The highest average earnings were recorded in rural villages to the west and north of Oxford and the north of Didcot and the lowest average earnings were recorded in Swindon and south-east Oxford.

In general, housing affordability (measured as the ratio of the average house price to national average household income) is higher in Swindon and Highworth and lower in central and northern parts of the study area, including Oxford and Kingston Bagpuize. In Oxford in particular, the affordability of housing can also vary depending on the type and size of dwelling being sought.

Key challenges:

- High levels of deprivation are observed in some parts of Swindon and Oxford. Improved public transport and walking and cycling infrastructure can help reduce deprivation by providing better access to employment opportunities and key services. It can also promote more positive health outcomes.

- The absence of affordable housing, particularly in Oxford forces lower income households into more affordable settlements. This can result in longer and more car dependent inter-urban movement patterns.

Economic activity

The EEH region is **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 reflects this, as education and health are the largest employers in the study area, followed by accommodation and food service activities. Education is the industry with the highest proportion of jobs at 18%, bolstered by the presence of the University of Oxford, Oxford Brookes University, and many of the Defence Academy of the United Kingdom's facilities at Shrivenham situated within the study area.

The study area is a significant contributor to the success of the region, contributing towards 10% of EEH's Gross Value Added (GVA) in 2018 (£15.5 billion) with this forecast to grow to £52 billion per annum by 2049. Of this 13% was associated with education, a proportion significantly higher than the average for EEH region (6%); 13% was associated with Property; and 12% was associated with Professional, Scientific and Technical Activities.

Key challenges:

- To maximise the economic potential of key industries within the study area, interventions should focus on connecting centres of employment, such as Harwell Campus, with a skilled workforce.

Public transport services

High frequency local bus services serve the major settlements with two distinct inter-urban bus corridors: north-south between Oxford and Harwell Campus via Abingdon and Didcot, and east-west between Oxford and Swindon via Shrivenham, Faringdon and Kingston Bagpuize. Long journey times contribute to buses not being as attractive as driving for many potential users. Under the Business as Usual (BaU) scenario with no additional interventions, **by 2049 it is expected that 150,000 daily return trips to/from and within study area will be made by bus or rail, increasing from 145,000 in 2021.**

For some journeys rail connectivity is provided by the Great Western Main Line (between Didcot and Swindon) and Cherwell Valley Line (between Didcot and Oxford). However, despite necessary infrastructure being present, there is no direct passenger rail service between Oxford and Swindon. Settlements and employment areas in the central parts of the study area (such as Wantage and Grove) currently lack access to rail services. When complete, East West Rail will directly connect Oxford with Milton Keynes, with later stages providing direct connections through to Cambridge. Extending such services would directly connect key education and employment centres of Swindon, Bristol and beyond.

Key Challenges:

- Lack of direct rail services between Swindon and Oxford, and absence of an intermediate railway station between Didcot and Swindon restricts opportunities to increase access and reduce local road congestion.

- A number of settlements in the Science Vale lack access to high frequency bus services (e.g., Wantage and Stanford) and some smaller villages to the west of Wantage are not served by any buses at all.

- Traffic congestion and absence of bus priority infrastructure affects the attractiveness and journey time reliability of bus services.

Highway network and travel by car

Highway connectivity in the study area comprises nationally significant radial routes that form part of the Strategic Road Network (SRN), including the M4, A34 and A419, as well as the A420 (part of the Major Road Network), A4142 and A419. **By 2049 it is expected that 1.2 million daily return trips to/from and within study area will be made using cars, increasing from 950,000 in 2021.**

East west connectivity is principally provided by the A420, a single carriageway A Road that accommodates local and strategic traffic movements to provide an important regional connection between Swindon and Oxford. A high number of serious and fatal severity accidents have been recorded along this route. This could be attributed to the route's rural nature, the mix of traffic using the route (particularly HGV traffic avoiding the longer M4 and A34 route), a large number of junctions, and that most of the route is subject to the national speed limit.

Parts of the highway network experience significant levels of delay and congestion in the AM and PM peak periods. This includes the A34 south of Oxford, A419 southeast of Swindon, Milton Interchange at Didcot and the A420 east of Swindon. There is a clear rural and urban divide in the distribution of electric vehicle charging points (EVCPs), with the majority located in Oxford and Swindon (73%). In the smaller settlements and rural areas, where car dependency is highest, there is limited EVCP provision.

Key Challenges:

- The design standard of the A420, combined with the route's mixed function creating conflict between serving local and strategic traffic movements, contribute to existing road safety and traffic congestion issues.

- There is limited access to alternative modes and public charging infrastructure in smaller settlements and rural communities.

Active travel

Cycling uptake varies throughout the study area. Across the four largest settlements, the highest journey to work active travel mode share is observed in Oxford (36%) and lowest active travel mode share is observed in Swindon (15%). Didcot and Abingdon-on-Thames have an active travel modal share of 16% and 18% respectively. **By 2049 is it expected that 400,000 daily return trips will be made by active travel modes, an increase from 370,000 in 2021.**

Existing inter-urban active travel routes and infrastructure are focused around Oxford, Abingdon-on-Thames, Didcot and Wantage. At present there are no east-west inter-urban active travel routes. This provides limited opportunities for people living and working along the A420 to walk and cycle, particularly those living within settlements on the periphery of Oxford and Swindon.

A number of micro-mobility schemes (shared bicycle schemes, e-scooter schemes) operate in Oxford, Didcot and Abingdon-on-Thames. These modes can facilitate short and medium distance active travel journeys but also support longer distance journeys e-bikes and connecting with public transport.

Key Challenges:

- There is a lack of strategic east-west active travel infrastructure that limits opportunities for people to undertake inter-urban active travel journeys, particularly along the A420.

- Despite Swindon being the largest settlement in the study area, no micro mobility schemes operate in this settlement. This could reduce the number of short and medium distance trips by car and support longer journeys by public transport.

- The feasibility of inter-urban active travel commuting is limited as longer distances make cycling difficult.

Mobility Hubs

The study area already benefits from several mobility hubs that provide a central point for users to transfer between different modes of travel. Most notable among these are the "Park & Ride" facilities located in the Oxford and Swindon urban areas which provide private car users in particular the ability to avoid driving into central areas by connecting with reliable bus connections.

Oxford Parkway is a local example of a mobility hub, providing direct rail connections with Oxford and London by Chiltern Railways, as well as with Milton Keynes, Bedford, and Cambridge upon full completion of East West Rail. It also provides large numbers of cycle parking spaces, connects with a range of local bus services, and provides amenities and a small retail offer.

Transport hubs are important strategic transport nodes that reflect the needs of the local community, respond to local geography, and maximise opportunities for users to choose more sustainable modes for all or part of a given journey.

Key Challenges:

- Many potential mobility hubs and similar facilities have sought to avoid private cars travelling into busier urban areas rather than maximizing their ability to facilities more sustainable strategic and local journeys across all relevant modes for that location.

- Naming sites as "Park & Ride" and focusing their design on large car parks, while useful for private vehicle drivers, could limit their potential to be valuable strategic hubs for all types of travel and user.

- Many areas that could benefit from a hub to transfer between modes (for example, quality walking and cycling routes, and provision of cycle parking to facilitate transfer with local and intercity bus services) do not currently have facilities like toilets or e-cycle charging.

Digital connectivity

The COVID-19 pandemic has led to a significant increase in the number of people working from home and increased the importance of good digital connectivity. It is also leading to changes in the way that offices are structured. For example, Savills finding that office vacancy rates in London have increased from 4.9% to 8.9% from early 2020 to 2022.

Digital connectivity varies across the study area, with the lowest download speeds observed in rural communities, with many areas experiencing average download speed of less than 25 mb/s. The highest average download speeds are generally concentrated in both Oxford and Swindon. However, there is significant variation in download speeds within urban areas, with parts of Oxford and Swindon recording average download speeds of less than 25 mb/s.

The "EEH Working from Home Propensity and capacity release report" outlines through using the Capacity Release Model estimates that remote and hybrid working could result in a 12% reduction in traffic congestion for the study area. As such Improved digital connectivity, particularly in rural areas east of Swindon where the lowest average download speeds are observed, could help facilitate the adoption of agile and hybrid working practices, and in turn, reduce the need to travel.

Key Challenges:

- Digital connectivity is highly variable across the study area.

- Slow average download speeds, particularly in rural areas to the southeast of Swindon, has the potential to restrict opportunities for people to adopt agile and hybrid working practices.

Landscape and Protected Areas

The study area is dominated by the broad clay vale that lies between the Cotswolds to the north and the sparsely populated chalk hills of the Marlborough, Lambourn and Berkshire Downs to the south. Running through the centre of this vale is a ridge, separating the valley of the Thames to the north, from the Vale of White Horse. The ridge itself accommodates a string of small settlements along a ridgeway route (that has become the A420) between Swindon and Oxford.

Parts of the study area fall into Flood Zones 2 and 3. The northern part of the study area, especially the land surrounding Oxford along the River Thames is very susceptible to flooding and is predominantly categorised as a Flood Zone 3.

There are numerous protected areas within the study area. A greenbelt exists surrounding Oxford, covering an area in the north-east corner of the study area and the southern area is dominated by the North Wessex Downs and Chilterns Area of Outstanding Natural Beauty (AONB).

Key Challenges:

- The delivery of large-scale infrastructure improvements south of Oxford, close to the River Thames, may be challenging due to the potential flood risk

- The Oxford greenbelt has a substantial influence on the location of planned growth in Oxfordshire, and the resultant connectivity requirements across the Science Vale.

- Protected areas within the study area, including the North Wessex Downs AONB and Oxford Greenbelt, may hinder the delivery of new large scale transport infrastructure.

Air quality

In 2019 total CO_2 emissions in the EEH region stood at 28,827kt, equating to 10% of all emissions in the UK. Additionally, over the last five years CO_2 emissions have fallen at a slower rate than average for the UK of an 11% reduction compared to -13% between 2012-2017. The average transport carbon emissions per capita in EEH are higher than the UK average with the highest carbon emissions per capita recorded in the rural local authorities that form part of the study area, notably South Oxfordshire and Vale of White Horse.

The study area is responsible for 13% of all transport carbon emissions in the EEH region. Whilst high, this is likely to be largely associated with the study area's dense Strategic Road Network and amount of traffic travelling through the study area.

Areas of poor air quality can be identified from the location of Air Quality Management Area (AQMAs), which are typically located where large inter-urban corridors and strategic roads pass through urban areas (for example, West of Oxford near Botley Interchange, where the A420 intersects the A34), and or in historically constrained areas such as central Oxford. There are also several small AQMA's in Abingdon-on-Thames, especially in the town centre. The other small AQMA in the study area is located in Marcham.

Key Challenges:

- Encouraging behaviour change and mode shift towards sustainable modes.

- Greening of public and private vehicle fleets, particularly in areas where active travel is not feasible and public transport services are not commercially viable.

- Creating a stronger / more reliable digital future to reduce the need to travel.

Key Opportunities and Need for Intervention

The current challenges facing the Swindon – Didcot – Oxford study area are primarily due to the high levels of car dependency and the relatively high proportion of people living in small and medium sized settlements and rural communities which are harder to serve by active and sustainable travel modes.

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

Figure 3: Key Opportunities for the Study Area

Mass Rapid Transit

Public transport services working at high frequencies with priority infrastructure provision can help to create attractive public transport connections for both urban settlements and rural areas.

Shared mobility services

Roll out/expansion of shared mobility schemes throughout the corridor can help offer affordable and attractive access to active travel opportunities to replace car travel and update interchanges to improve public transport journey times and reliability.

Rail access improvements

Access and connectivity onto the Great Western Mainline could be improved with additional and improved stations and interchanges in areas such as Wantage and Grove to facilitate better sustainable connectivity from the smaller settlements to Oxford, Didcot and Swindon.

Sustainable first/last mile and rail freight

The use of more sustainable first and last mile freight combined with rail-based freight transport and implementation of multi-modal freight interchanges can help move freight transport away from traditional HGV road-based movements.

Pinch point improvements

Highway improvement schemes that address congestion and capacity issues along existing routes.

Transport hubs

Combining public transport, active travel and demand responsive transport services with Transport hubs can help to make sustainable travel more attractive.

Urban active travel improvements

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

Study Objectives

Figure 4 details the **10 objectives established with stakeholders for the study area** based on the evidence base and issues and opportunities identified. These are centred around the four key strategic principles set out in England's Economic Heartland's Transport Strategy.

Figure 4: Study Objectives

Key Principles from EEH's Transport Strategy			
Achieving net zero no later than 2050, with ambition to reach this by 2040.	*Improving quality of life and wellbeing through a safe and inclusive transport system which emphasises sustainable and active travel.*	*Supporting the regional economy by connecting people and business to markets and opportunities.*	*Efficient movement of people and goods through the region and to international gateways.*
Objectives for the study area			
1a – Promote and enable the use of sustainable and active travel modes **1b** – Use technology to reduce the need to travel and enable more sustainable travel (e-vehicles, shared mobility etc) to reduce carbon impacts of transport	**2a** – Create a transport network within the corridor that provides comprehensive access to education, health, leisure and retail destinations, is affordable and accessible for all and socially inclusive **2b** – Minimise road danger and the impact of transport-related air and noise pollution on local communities	**3a** – Improve sustainable connectivity to key economic areas (including major town and city centres, Enterprise Zones, Science Parks, Research and Technology Zones) to better connect workforce to high value opportunities and reduce inequality **3b** – Ensure new developments have good access to a sustainable transport network and are accessible for all	**4a** – Enable efficient, safe and sustainable movement of people and goods through the corridor and to key international gateways, ensuring impacts on local communities from freight traffic are minimised **4b** – Facilitate sustainable first mile/last mile connectivity for people and goods in both urban and rural areas

Critical Success Factors

To help shape the development of this Connectivity Study and the development of a long list of transport interventions for the study area, **eight critical success factors were identified** 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.

These Critical Success Factors were:

1. Improved digital infrastructure reduces the need to travel.

2. The carbon emissions of transport are reduced to zero by 2050.

3. Improved transport connectivity enables sustainable and high-quality development growth, helping to address inequalities and accessibility issues.

4. The benefits of new technologies that enable improved connectivity are accessible to everybody.

5. A high-quality, sustainable, integrated and accessible transport network connects the study area's Settlements of Strategic Importance and strategic economic assets.

6. Rural communities are well connected to key opportunities by the public transport network.

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

8. Active travel mode share of journeys within and to / from our towns and cities increases.

Scenario Planning

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

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

- **Radical Change**: high government spend, radical change in policy to support improved health and decarbonisation and a resilient economy.

- **High Tech**: positive public and government attitudes towards technological change, high levels of home working, lower overall and peak travel demand, reduced demand for traditional public transport and private car ownership.

- **Slow Recovery**: slow return to the pre-Covid business-as-usual and an economy vulnerable to economic shocks, fewer journeys for all trip types, across all modes especially peak time.

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

Potential interventions were then assessed within the study's MCAF (see below) in the context of the Alternative Futures and Infrastructure Scenarios with the purpose of considering if any interventions which were assessed as being borderline under a Business-as-Usual state would be more appropriate recommend under an alternative future(s).

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

Intervention Identification and Assessment

An initial long list of potential interventions and options was developed **from a wide range of sources**, including input from the project team, steering group, stakeholder group, call for evidence and expert panel, with additional desk research also undertaken. This included a review of local transport planning policy documents as well as a review of the challenges and opportunities identified in the evidence base.

In total, **171 'potential' interventions** were included in the long list with suggestions were only excluded from the Long List if they:

- Did not primarily address movement within the study area.

- Were not considered to be at sufficient scale to have regional significance (i.e., a specific, small-scale cycle intervention) – *note that many small-scale interventions are covered by wider regional interventions*.

- Are a committed development (schemes where construction had already started or those with identified funding and a clear delivery timescale).

- Did not pass a basic 'common sense' feasibility test (i.e., if they were based on an unproven technology) (e.g., Hyperloop).

An initial assessment of the potential interventions excluded 68 potential interventions. Reasons for exclusion ranged from the scheme already being committed or delivered, being a duplicate, not supporting strategic movements in the study area, being addressed as part of another connectivity study, through to not being in the study area.

The remaining 103 potential interventions then progressed to detailed assessment.

Multi-Criteria Assessment

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

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

- **The Strategic Dimension**: How well each option contributes to achieving the study's principles and objectives and how well it is aligned with national, EEH and local policy.

- **The Economic Dimension**: The nature and scale of the economic, environmental, and social impacts of each option.

- **The Deliverability Dimension**: The deliverability of each option, specifically: An options financial case (likely cost and affordability), an options deliverability / management case (timescale, technical complexity and acceptability) and the quality of supporting evidence.

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

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

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

Packaging of Interventions

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

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

Figure 5: Inputs Informing Package Development

At a top-down level, the packages combine consideration of the EEH's Transport Strategy, study specific sub-objectives, critical success factors and Infrastructure Scenarios, expert advice, stakeholder and officer feedback. This top down 'vision led' approach was then combined with the individual assessment of the long list, with interventions not taken forward at this time deemed as 'parked'.

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

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

1. Around a single location (e.g., a coherent urban area).

2. Based around common types of locations (e.g., science parks or market towns).

3. By mode type or other characteristic (e.g., freight).

Phasing and Indicative Timeframes

Based on stakeholder input from the Infrastructure Scenario development, intervention phasing was considered as part of the packaging process.

This was based on three key time periods:

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

- **Medium term** schemes were judged to have a construction start date between 2033 and 2040.

- **Long term** schemes were judged to have a construction start date from 2041 onwards.

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

Oxford Parkway Transport Hub (Steer)

Recommended Connectivity Plan

Building on the evidence base and following the process detailed above, this study recommends the implementation of **70 interventions** to achieve a step change in connectivity for the area. These have been **grouped into six packages** that together will help to realise our Transport Strategy vision:

1. *Improved Inter-Urban Connections* - Making the most of existing road and rail corridors with a particular focus on the A420 and A34, as well as electrification and extension of intercity and regional rail services.

2. *Reducing Congestion and Improving Sustainable Connectivity in Oxford Urban Area* - Reducing car dependency in and around Oxford through improved active travel infrastructure, enhanced public transport services, and demand management.

3. *Reducing Congestion and Improving Sustainable Connectivity in Swindon Urban Area* - Reducing car dependency in and around Swindon with logistics partnerships, improved active travel infrastructure, and enhanced public transport services.

4. *Better Connecting Market Towns, Innovation Hubs, and Rural Areas* - Reducing the number of unnecessary trips through improved digital connectivity, improving local roads and transport choice by making public transport more reliable and accessible.

5. *Moving Freight More Effectively* - Partnering with the private sector to reduce congestion caused by freight traffic, securing the future of regional freight terminals, and commissioning work to further understand local freight needs.

6. *Creating a Sustainable Integrated Transport Network* - Better integrating transport modes and reducing their overall cost and impact on the environment to encourage multi-modal journeys that more sustainably meet individual travel needs.

In addition to **reducing car dependency and providing significantly improved access to employment and education opportunities** across and beyond the study area, the logic and benefits of each package was also confirmed through modelling using EEH's Economy Land Use Model (EEHULUM).

Compared to a business-as-usual baseline, the EEHULUM results show that if implemented in full the recommended connectivity plan could achieve the following step change each weekday by 2050:

- **75,000 fewer journeys by private vehicles (including cars)**
- **62,000 more journeys by bus**
- **45,000 more trips made by walking or cycling**
- **20,000 more journeys by train**

While further detailed work on costs and benefits will be undertaken as schemes are progressed by relevant authorities, the indicative capital investment required to deliver this plan is £5.6 billion, with estimated annual maintenance and renewal requirements of £225 million, over 30 years.

By 2050 this investment could deliver the following for the area compared to the business-as-usual baseline:

- **22,000 tonnes less CO2e emitted per year**
- **3,200 additional new jobs created**
- **£280 million in GVA per annum**
- **2,400 additional new residents**

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

A full list of these interventions is included in this connectivity plan is included in Appendix A.

Recommended Connectivity Plan Summary Map

Legend

- - - - Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- (MH) Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park

- Bus & active travel enhancements
- Rail service enhancements
- = = New rail track
- Rail electrification
- New railway station
- (MH) New Mobility Hub
- Strategic Freight Study
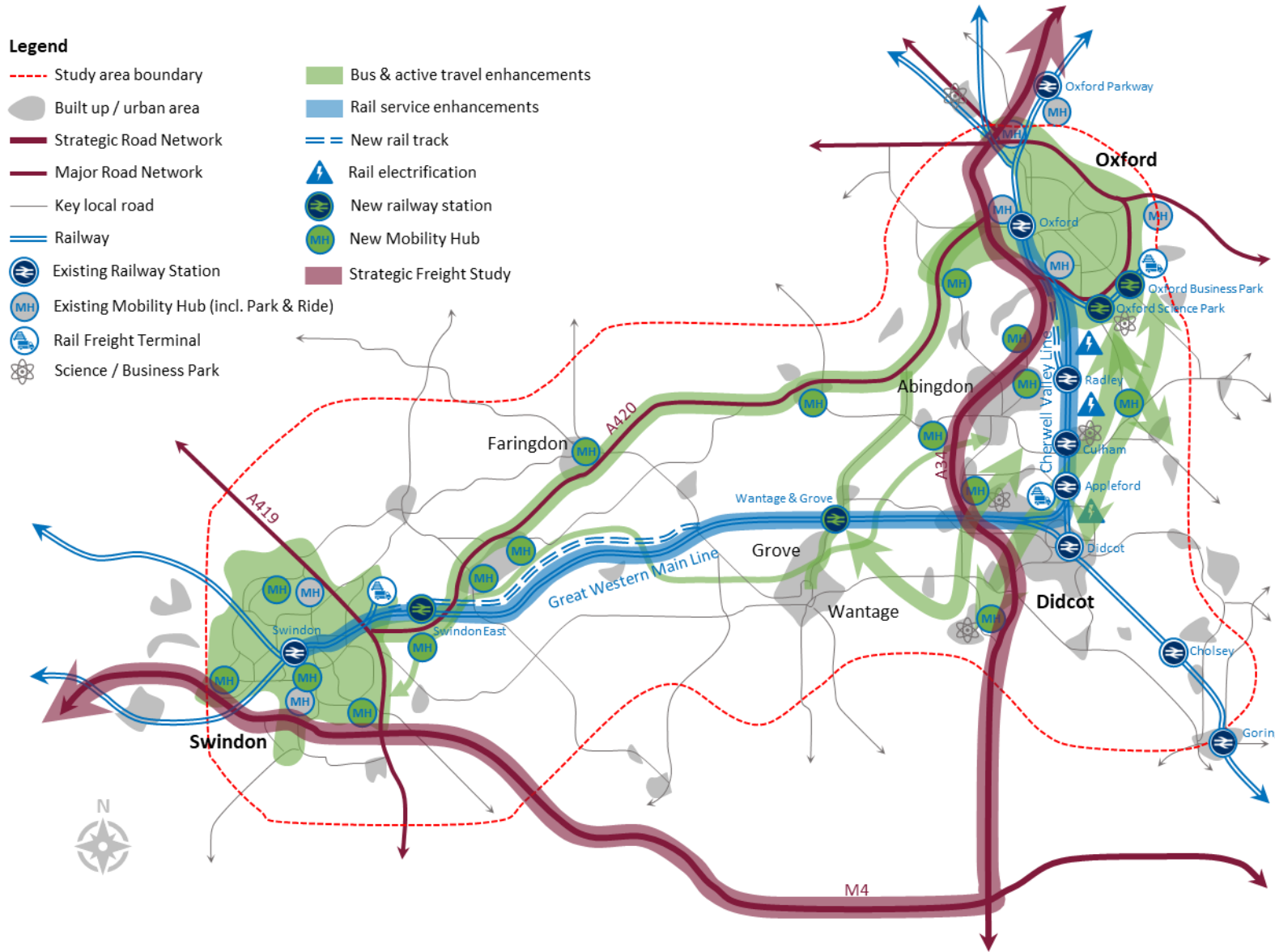
Package 1: Improved Inter-Urban Connections

The focus of this first package is on *making the most of existing road and rail corridors with a particular focus on the A420 and A34, as well as electrification and extension of intercity and regional rail services*.

Interventions included in this package support further decarbonisation of the transport network by moving more people, more reliably, and more quickly by making better use of existing road infrastructure. The electrification and extension of rail services including planned East West Rail services beyond Oxford to Didcot, Swindon and beyond to Bristol would further support this by providing an even more efficient, direct and reliable alternative to driving.

Extension of rail services will also create **a vital and more sustainable transport connection between the major universities of Oxford, Bristol, and Bath**, as well as other research and education institutions such as the Swindon and Wiltshire Institute of Technology. The planned extension of East West Rail services to Cambridge (via Bletchley/Milton Keynes and Bedford) will add to the value of the connection.

Benefits of this package are expected to include:

- **Removing unnecessary vehicles journeys** from the A420 and A34 to improve journey time reliability and avoid the need for unnecessary highway capacity improvements.

- **Creating additional rail capacity to move more freight and passengers** more effectively, including creating the conditions to better connect the area with Milton Keynes and Cambridge, Birmingham, Bristol, and London and facilitate more services through the area.

- **Supporting further decarbonisation** through increased mode shift to bus and rail from private car, and the electrification of the Cherwell Valley Line 'missing link' between Didcot Parkway and Oxford railway stations.

Key links to other packages include:

- **Ensure seamless connections between transport modes**, particularly to encourage existing private car drivers to use bus or rail services for all or part of their journeys (including to/from ports and airports). For example, ensuring mobility hub locations in Swindon and Oxford are well integrated with the improved S6 bus service (Package 2 and 3).

- **Future proof existing and new railway stations as intermodal mobility hubs**. For example, ensuring the proposed new stations east of Swindon (Package 3) and at Wantage and Grove (Package 4) include an appropriate level of well-managed vehicle parking (cars, bikes, scooters, charging facilities, etc.) for future demand, and are well integrated with local bus and DRT services, and active travel networks.

- **Encouraging mode shift council reduce the need for demand management** measures and or lower price signals required to deliver the same benefit from schemes such as the Oxford Workplace Parking Levy (Package 2).

To ensure delivery of interventions aligns with our transport vision, consideration needs to be given to:

1. Cherwell Valley Line capacity improvements and electrification being committed to in advance of future rolling stock investment cycles.

2. Upgrades to bus services such as the S6 service on the A420 corridor following improvements to existing bus stops as part of local walking and cycling network improvements with faster and more reliable journey times so there is a real alternative to the car.

3. Ensuring additional passenger and freight rail services are considered in contemporary timetable planning on the Great Western Main Line, including reinstating Bristol – Swindon – Oxford direct services.

Package 1 Summary Map

Legend

- Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- MH Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park
- Bus & active travel enhancements
- Rail service enhancements
- New rail track
- Rail electrification
- New railway station
- MH New Mobility Hub
- Strategic Freight Study
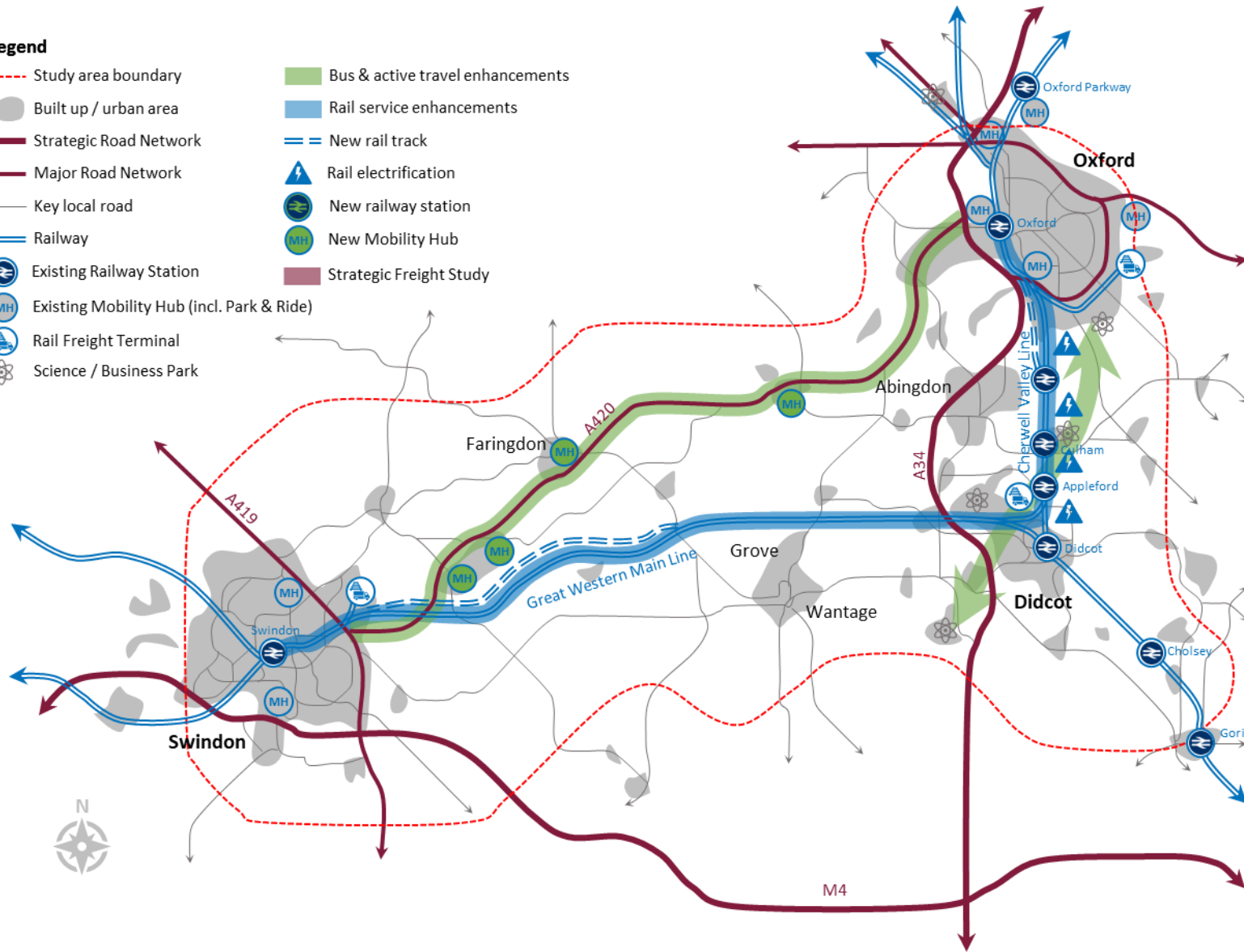
Interventions

- Bus Improvements to S6 Service (Oxford to Swindon via Faringdon)
- Expansion of Bus Rapid Transit between Oxford and Science Vale
- A420 Bus Priority Measures (not mapped)
- A420 Mobility Hubs
- A34 Bus Priority Measures (not mapped)
- Cherwell Valley Line Capacity Improvements between Oxford and Didcot
- Cherwell Valley Line Electrification between Oxford and Didcot
- Extension of Birmingham/Banbury Services beyond Oxford to/from Swindon and Bristol
- Extension of East West Rail Services beyond Oxford to/from Didcot, Swindon and Bristol
- A34 Junction Improvements (not mapped)
- A34 Road Safety Improvements (not mapped)
- A420 Junction Improvements (not mapped)
- A420 Road Safety Improvements (not mapped)
- Extension of Great Western Main Line Dynamic Passing

Package 2: Reducing Congestion and Improving Sustainable Connectivity in Oxford Urban Area

The focus of this second package is on *reducing car dependency in and around Oxford through improved active travel infrastructure, enhanced public transport services, and demand management*.

Interventions included in this package will substantially improve air quality and reduce congestion in the Oxford urban area through avoiding unnecessary vehicle journeys and moving more car trips onto improved public transport services, and active travel modes such as walking or cycling.

The Oxford Zero Emissions Zone (ZEZ), Workplace Parking Levy and Traffic Filters will result in **a fundamental shift in how trips are made to, from and within the urban area**. Together these three interventions are expected to present significant public health, individual wellbeing, air quality and decarbonisation benefits for the city.

Benefits of this package are expected to include:

- **Encouraging commuters to switch away from using private and more polluting vehicles** to less polluting and more space efficient modes of travel to reduce congestion, with appropriate exemptions and discounts for key types of users.

- **Making better use of Oxford's existing local roads** through greater priority for improved bus services and active travel while still maintaining access through filters for essential road users such as emergency services (as well as some access for local residents and businesses).

- **Creating new rail connections to London** for the Oxford Science and Business Parks, as well as existing and planned local communities, facilitated by ongoing and planned upgrades to Oxford railway station and the reopening of the Cowley Branch line to passenger rail services.
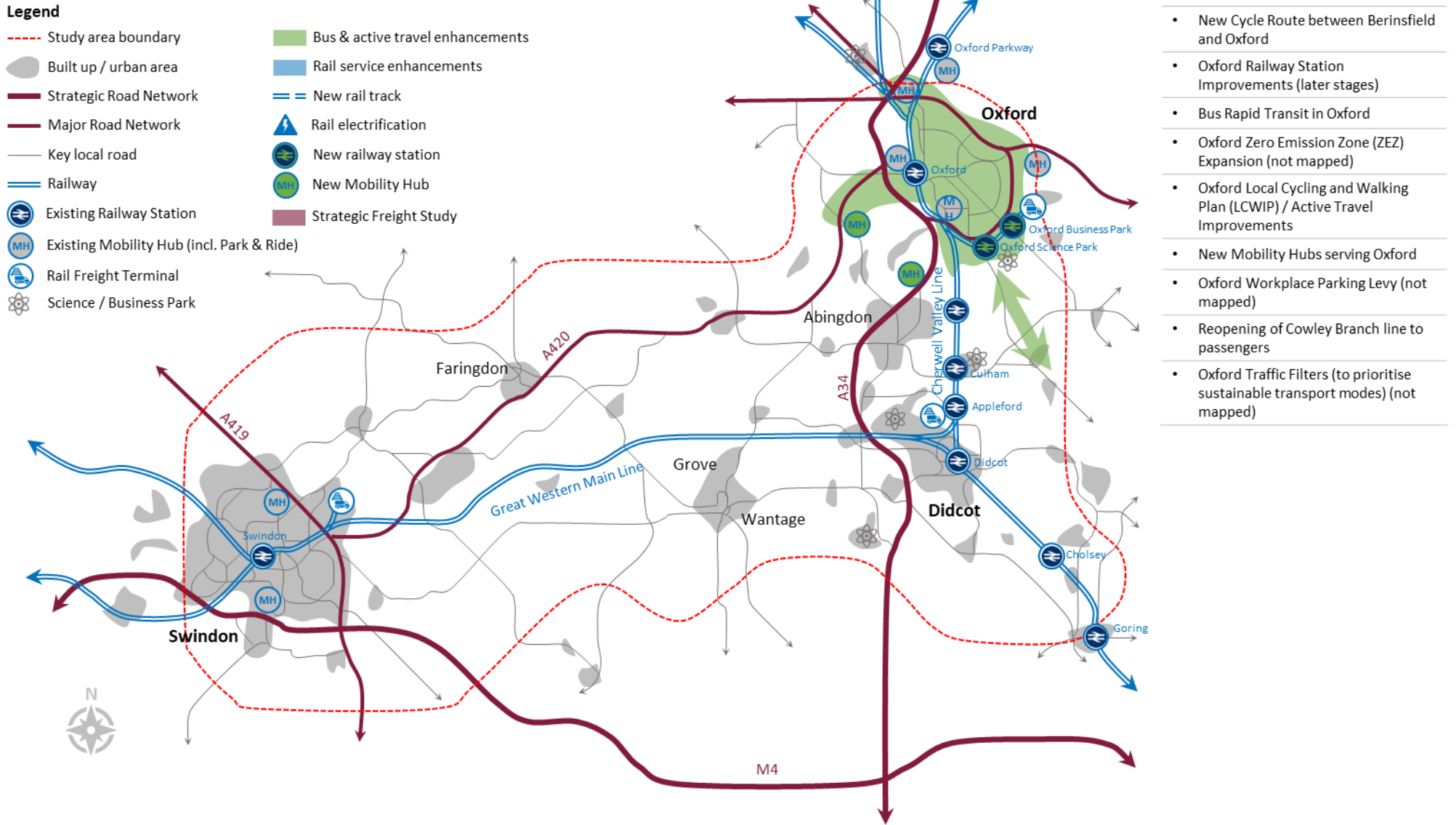
Key links to other packages include:

- **Greater use of public transport to and from Oxford** through additional rail services serving an even greater number of destinations such as Swindon, Milton Keynes, Birmingham, Bristol, and London (Package 1).

- **Facilitating more sustainable freight movements within Oxford** with increased use of more sustainable approaches to first and last mile freight delivering (Package 5) and safeguarding the rail freight terminal at Cowley currently being used exclusively by BMW (Package 5).

- **Improved inter-urban bus journey reliability** with bus priority measures and mobility hubs sites in Oxford supporting enhanced services on key corridors (Package 1) and those connecting market towns, Innovation Hubs, and Rural Areas (Package 4).

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

1. Planning for future bus service improvements within and to/from Oxford, including integrating with planned railway stations at Oxford Science Park and Oxford Business Park, and planned rail service improvements.

2. Consideration needs to be given to use and re-design of roads benefiting from reduced levels of traffic through demand management. For example, urban realm improvements and re-allocation of space to active travel usage.

3. Future phasing of the ZEZ and demand management measures as the national vehicle fleet becomes increasingly decarbonised and more efficient.

Package 2 Summary Map

Legend

- Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- MH Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park
- Bus & active travel enhancements
- Rail service enhancements
- New rail track
- Rail electrification
- New railway station
- MH New Mobility Hub
- Strategic Freight Study

Map labels: Oxford Parkway, Oxford, Oxford Business Park, Oxford Science Park, Abingdon, Cherwell Valley Line, Culham, Appleford, Didcot, Cholsey, Goring, Faringdon, A420, A34, A419, Grove, Wantage, Great Western Main Line, Swindon, M4

Interventions

- New Cycle Route between Berinsfield and Oxford
- Oxford Railway Station Improvements (later stages)
- Bus Rapid Transit in Oxford
- Oxford Zero Emission Zone (ZEZ) Expansion (not mapped)
- Oxford Local Cycling and Walking Plan (LCWIP) / Active Travel Improvements
- New Mobility Hubs serving Oxford
- Oxford Workplace Parking Levy (not mapped)
- Reopening of Cowley Branch line to passengers
- Oxford Traffic Filters (to prioritise sustainable transport modes) (not mapped)

Package 3: Reducing Congestion and Improving Sustainable Connectivity in Swindon Urban Area

The focus of this third package is on *reducing car dependency in and around Swindon with logistics partnerships, improved active travel infrastructure, and enhanced public transport services.*

Interventions included in this package will provide greater transport choice to those living in or visiting the Swindon urban area, reducing the need and desire to make private car journeys, and releasing local road capacity for other uses (e.g., bus priority lanes, public realm improvements, additional car parking, etc).

Making better use of existing local roads through enhanced bus services and active travel improvements will complement additional rail services connecting residents with employment and education opportunities in Oxford, Birmingham, London, and further afield. More equitable transport access will help reduce car dependency and provide improved connections with and between key services.

Benefits of this package are expected to include:

- **Making better use of Swindon's existing local roads** through greater priority for improved bus services and active travel.

- **Reducing the number of vans and trucks on Swindon's roads** through better coordination of freight movements, including freight consolidation and improved walking and cycling networks facilitating more sustainable first and last mile deliveries made on foot and using bicycles.

- **Helping avoid congestion from planned housing development** through new local railway station east of Swindon developed as a key mobility hub integrated with enhanced local and inter-urban bus services, active travel networks, and upgrades to the Great Western Main Line and A420.
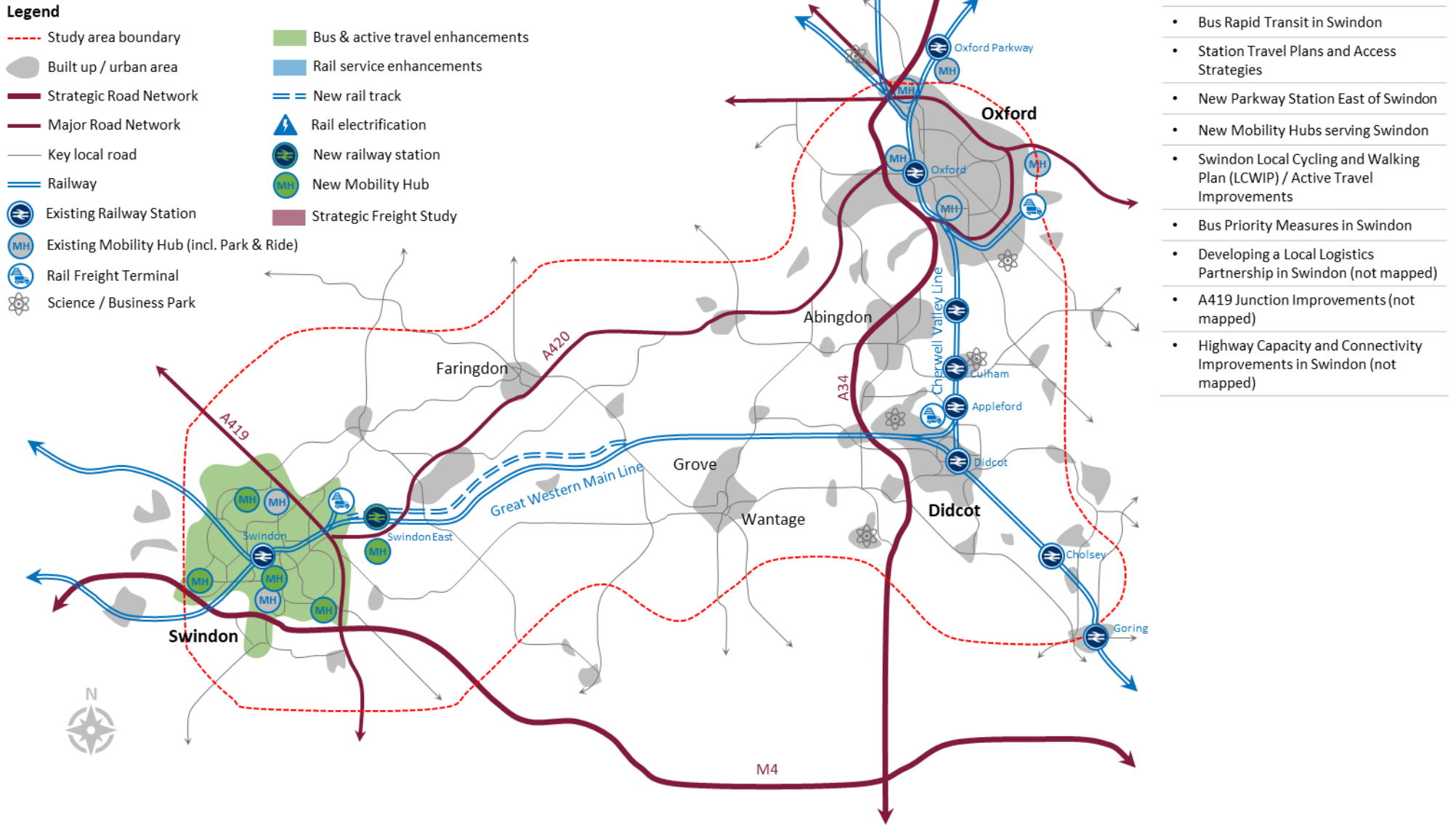
Key links to other packages include:

- **Direct rail connections with Oxford, Milton Keynes and Birmingham** through additional rail services facilitated by capacity improvements on the Cherwell Valley Line between Oxford and Didcot and extension of future East West Rail and other services, including those offered by new open access operators (e.g. Grand Union) (Package 1).

- **Improved inter-urban bus journey reliability** with bus priority measures and mobility hubs in Swindon (including new railway station east of Swindon) supporting enhanced services on key corridors (Package 1) and those connecting market towns, Innovation Hubs, and Rural Areas (Package 4).

- **Facilitating more sustainable freight movements within Swindon** with increased use of more sustainable approaches to first and last mile freight delivering (Package 5), and an enhanced rail freight terminal and logistics park close to the former Honda factory site (Package 5).

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

1. Ensuring plans for the New Eastern Villages Development and other planned housing are updated to incorporate the proposed upgrades to the A420, Great Western Main Line, and new railway station east of Swindon.

2. Measures to improve effectiveness of local freight operations and improved bus services should be enacted before highway capacity and junction improvements to ensure it is clear they still need to be commissioned and present value for money.

Package 3 Summary Map

Legend

- – – – Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- MH Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park
- Bus & active travel enhancements
- Rail service enhancements
- = = New rail track
- Rail electrification
- New railway station
- MH New Mobility Hub
- Strategic Freight Study

Interventions

- Bus Rapid Transit in Swindon
- Station Travel Plans and Access Strategies
- New Parkway Station East of Swindon
- New Mobility Hubs serving Swindon
- Swindon Local Cycling and Walking Plan (LCWIP) / Active Travel Improvements
- Bus Priority Measures in Swindon
- Developing a Local Logistics Partnership in Swindon (not mapped)
- A419 Junction Improvements (not mapped)
- Highway Capacity and Connectivity Improvements in Swindon (not mapped)

Package 4: Better Connecting Market Towns, Innovation Hubs & Rural Areas

The focus of this fourth package is on *reducing the number of unnecessary trips through improved digital connectivity, improving local roads and transport choice by making public transport more reliable and accessible.*

Interventions included in this package will reduce the need for those living and working outside the larger urban to make unnecessary trips by ensuring a high standard of digital connectivity, thereby reducing pressure on local roads.

The enhancement of bus services (including Rural Demand Responsive Transit (DRT)) integrated with a new railway station mobility hub at Wantage and Grove will provide a significantly more attractive alternative to the private car, helping to lower cost of living pressures as well as emissions.

Benefits of this package are expected to include:

- **A new railway station at Wantage and Grove** delivered as an additional stop on existing four track section of the Great Western Main Line and integrated with enhanced local bus services, new and improved active travel routes (including possible Wilts and Berks Canal restoration), and electric vehicle charging for cars and micro mobility.

- **Improving digital connectivity to reduce the need to travel**, making it easier to live and work outside the larger urban areas with improved digital connectivity creating reliable connections for those working from home or needing to access education, health, or personal opportunities which are not currently possible.

- **Links with rural communities and market towns and key destinations will be strengthened** through improved transport connections with key employment and education centres like Swindon and Oxford.
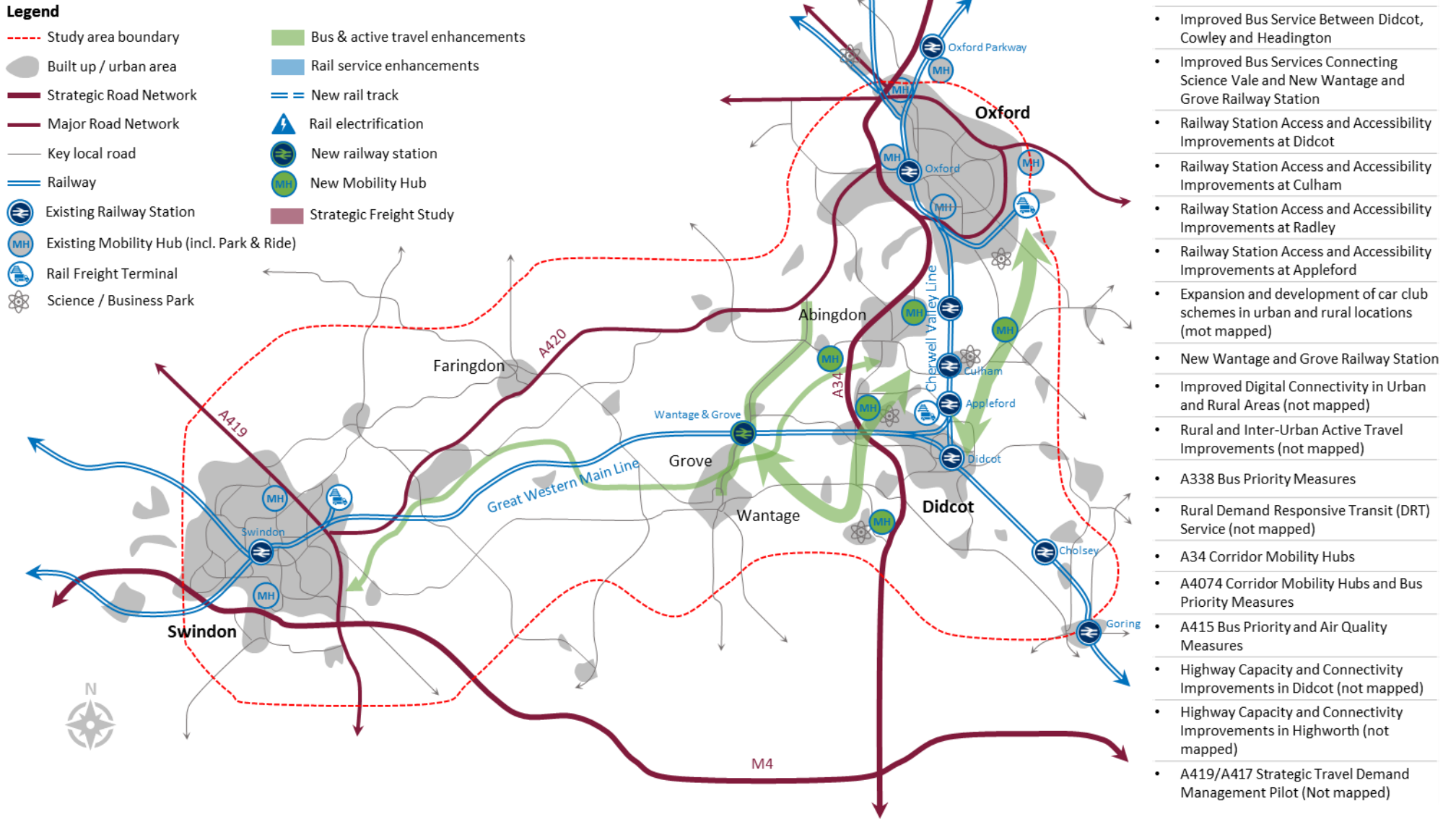
Key links to other packages include:

- **Better connections with Swindon, Oxford, Birmingham, and Milton Keynes** through extension of direct rail services between Oxford and Swindon enabled by Cherwell Valley Line capacity improvements (Package 1).

- **Improved inter-urban bus journey reliability** with bus priority measures and mobility hubs in Oxford (Package 2), Swindon (Package 3) and bus priority measures along key corridors like the A420 and A34 (Package 1).

- **Removing unnecessary freight journeys from local roads** through greater use of rail freight, more sustainable first and last mile delivery and encouraging greater use of the Strategic Road Network (Package 5).

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

1. Delivery of the Wantage and Grove railway station which could support elements of planned housing in the area, including upgrades to active travel routes and local bus service routes and improvements.

2. Railway station upgrades should be planned to consider both immediate improvements such as platform accessibility, but also longer term considerations like ensuring sufficient electricity supply to enable large scale electric vehicle charging at stations.

Legend

- – – – Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- MH Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park

- Bus & active travel enhancements
- Rail service enhancements
- = = New rail track
- Rail electrification
- New railway station
- MH New Mobility Hub
- Strategic Freight Study

Oxford Parkway
MH
MHH
Oxford
MH
Oxford
MH
MH
Cherwell Valley Line
Abingdon
MH
Culham
A34
MH
Appleford
Wantage & Grove
Grove
Didcot
Didcot
Faringdon
A420
A419
Great Western Main Line
Wantage
MH
Swindon
MH
Cholsey
Swindon
MH
Goring
N
M4

Interventions

- Improved Bus Service Between Didcot, Cowley and Headington
- Improved Bus Services Connecting Science Vale and New Wantage and Grove Railway Station
- Railway Station Access and Accessibility Improvements at Didcot
- Railway Station Access and Accessibility Improvements at Culham
- Railway Station Access and Accessibility Improvements at Radley
- Railway Station Access and Accessibility Improvements at Appleford
- Expansion and development of car club schemes in urban and rural locations (mot mapped)
- New Wantage and Grove Railway Station
- Improved Digital Connectivity in Urban and Rural Areas (not mapped)
- Rural and Inter-Urban Active Travel Improvements (not mapped)
- A338 Bus Priority Measures
- Rural Demand Responsive Transit (DRT) Service (not mapped)
- A34 Corridor Mobility Hubs
- A4074 Corridor Mobility Hubs and Bus Priority Measures
- A415 Bus Priority and Air Quality Measures
- Highway Capacity and Connectivity Improvements in Didcot (not mapped)
- Highway Capacity and Connectivity Improvements in Highworth (not mapped)
- A419/A417 Strategic Travel Demand Management Pilot (Not mapped)

Package 5: Moving Freight More Effectively

The focus of this fifth package is on *partnering with the private sector to reduce congestion caused by freight traffic, securing the future of regional freight terminals, and commissioning work to further understand local freight needs.*

Interventions included in this package will help to ensure the future of the freight and logistics sector in the study area through securing key locations for development of freight facilities rather than housing or other developments, improving freight movement on key routes like the A34, A420, A43 and M4, and better integrating more sustainable first and last mile solutions such as the increased use of cycling and walking to provide delivery and pick up services.

Safeguarding of rail freight locations will help to provide long term certainty for planning future development in the area and create opportunities for sustained employment in the freight and logistics sector. Doing so will also assist in rail and highway network planning, helping to make the most of existing infrastructure and ensuring freight remains an active planning consideration

Benefits of this package are expected to include:

- **Providing long term certainty for the local community and businesses** by ensuring the infrastructure is in place to facilitate job protection and growth in the private freight and logistics sector.

- **Reducing unnecessary traffic on local roads** by moving more freight trips onto the Strategic Road and rail networks and encouraging local logistics partnerships planning to make freight consolidation easier as well as addressing diversionary route impacts arising from freight traffic.

- **Improved public health outcomes** through air quality improvements resulting from large vehicles avoiding urban areas, increased use of electric vehicles, and a much greater emphasis on first and last mile delivery through cycling and walking-based methods (e.g. Cargo Bikes).
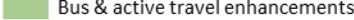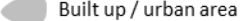
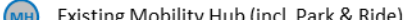Key links to other packages include:
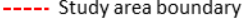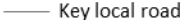
- Safeguarding of key freight locations will be a key consideration in upgrades to the Cherwell Valley Line (package 1), ensuring that new passenger services are balanced with additional paths for freight.

- Expansion of the electric vehicle charging point network across the study area (Package 6) will help to accelerate increased uptake of electric vehicles of all sizes to move freight to, from and through the study area.

- Highway capacity improvements (Packages 3 and 4) and junction improvements (packages 1 and 3) will improve traffic flow for all vehicles, helping freight journeys avoid delays from congestion and bottlenecks.
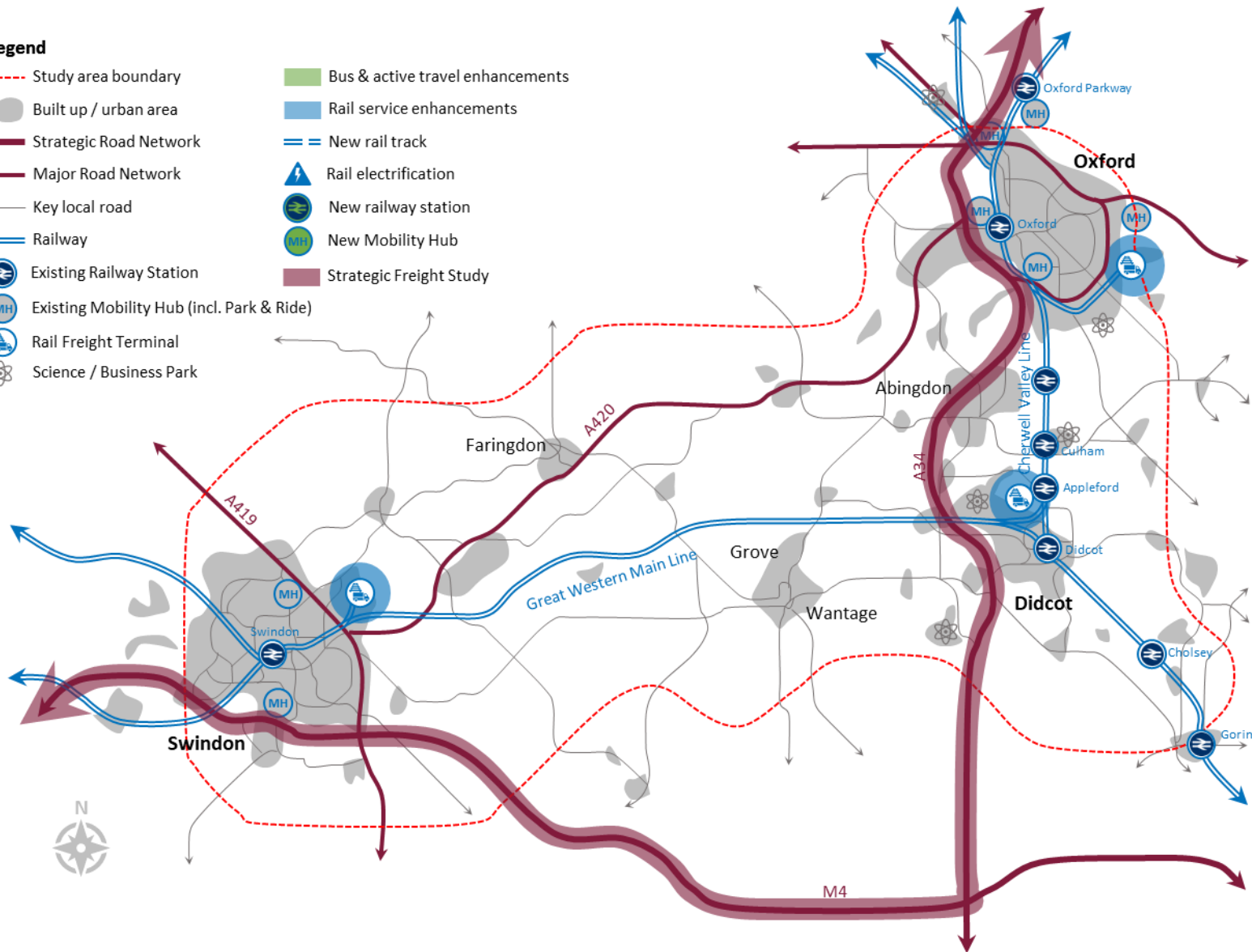
To ensure delivery of interventions is aligned with our Transport Strategy vision of net zero carbon by 2050 at the latest, consideration needs to be given to:

1. Ensuring sufficient electricity supply and infrastructure to meet the expected demand of electric rail and road freight in the study area. For example, ensuring existing or planned power supply conduits connecting rail freight terminals to the National Grid have sufficient capacity.

2. Electric vehicle charging for large freight vehicles needs to be planned and in place wherever possible on the Strategic and Major Roads Networks ahead of increased availability of electric HGVs.

3. Improved cycling routes in key urban areas such as Oxford, Swindon and Didcot should be in place as soon as possible to facilitate an effective transition to more sustainable first and last mile freight movements by cargo bikes or bikes being used to collect deliveries from hubs.

Package 5 Summary Map

Legend

- Study area boundary
- Built up / urban area
- Strategic Road Network
- Major Road Network
- Key local road
- Railway
- Existing Railway Station
- Existing Mobility Hub (incl. Park & Ride)
- Rail Freight Terminal
- Science / Business Park

- Bus & active travel enhancements
- Rail service enhancements
- New rail track
- Rail electrification
- New railway station
- New Mobility Hub
- Strategic Freight Study

Interventions

- M4 / A34 Priority Freight Route Study
- First Mile / Last Mile Sustainable Freight Delivery (not mapped)
- Developing Local Logistics Partnerships (not mapped)
- Safeguarding for Rail Freight Terminal at Cowley
- Safeguarding for Aggregate Rail Freight Terminal at Appleford
- Enhanced Rail Freight Terminal at Swindon
- Encouraging Freight from A420 to Strategic Road Network (not mapped)

Oxford Parkway · Oxford · Abingdon · Culham · Appleford · Didcot · Cholsey · Goring · Faringdon · Grove · Wantage · Swindon

A420 · A419 · A34 · M4 · Great Western Main Line · Cherwell Valley Line

Package 6: Creating a Sustainable Integrated Transport Network

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

Interventions included in this package will support all other packages by facilitating more sustainable travel choices and making it easier for individuals or items of freight to transfer between modes for all or part of a journey. They will also improve transport choice and accessibility for all potential users.

Central to this to this is supporting a move away from fossil fuel dependency and providing greater real time insights for customers and decision makers to help them plan and adapt their journeys based on the latest information. For example, real time information online and at stations and bus stops will enable someone travelling to work to know their bus may be delayed and plan an alternative route, with improved infrastructure making services more accessible.

Benefits of this package are expected to include:

- **Less dependency on fossil fuels** through a substantial increase in electric charging facilities for all vehicle types and the introduction of zero emissions buses on all routes in the study area.

- **Creating more seamless multi-modal journeys** through improved connectivity between different modes, seeking to eliminate long waits when changing between rail and bus services, as well as providing service frequencies in many areas that remove the need to review timetables and strengthening Community / Demand Responsive Transport Schemes.

- **Giving people the information they need for hassle-free wayfinding** through improved signage for all modes (e.g., road signs mobility hubs), and increased availability of live service and traffic information.

Key links to other packages include:

- Expanded bus services (Packages 1, 2, 3 and 4) combined with zero emissions buses and improved electric vehicle charging will together support reducing congestion and emissions by making it easier to choose alternatives to driving private cars for many journeys.

- Increasing rail capacity and service frequency (Package 1) and the introduction of new railway stations in Oxford (Package 2), Swindon (package 3) and Wantage and Grove (Package 4) will also provide better connections between bus and rail services.

- Safeguarding of rail freight terminals (Package 5) will help to provide long term certainty for measures to improve the integration of more sustainable freight services across the transport network in the study area.

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

1. Ensuring electric charging networks are in place ahead of the introduction of further zero emissions buses.

2. Where demand management measures reduce congestion in the short term, ensure the capacity is protected where appropriate for improved bus priority before it is consumed by induced private vehicle demand.

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

Impact Assessment

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

To model each package in EEHELUM, adjustments were primarily made to the generalised journey times (GJTs) within and between each zone (by mode) to reflect the anticipated impact users will get from the proposed interventions identified. The packages were modelled in EEHELUM from a base year of 2022 and run for 28 years to 2049. The results are presented as a comparison to a business-as-usual scenario (BAU), which is based on the national trip end model (NTEM) which also projects employment and population growth to 2049.

Investment and Expenditure

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

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

Connectivity Plan Benefits

Table 1 below summarises the key modelled impacts of each package and overall for all 70 interventions included in the recommended connectivity plan compared to a BAU scenario for 2049. It also includes the medium estimate of investment in construction and maintained, as well as an indication of relative operational investment requirements.

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

Demand Management

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

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

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

Table 1: Modelled Impacts and Estimated Investment

	Change in Daily Return Trips (Journeys to/from and within study area in comparison to BAU 2049)				Change in Socioeconomic Indicators (In comparison to BAU 2049)				Investment and Expenditure (Mid Cost - £ million 2022 prices)		
	Private vehicles*	Rail	Bus	Active	Population	Jobs	GVA (£ million per annum)	Carbon (KTCO$_2$e per annum)	Construction	Maintenance & Renewal	Operations
Business as Usual (BAU) 2049	*1,200,000*	*30,000*	*120,000*	*400,000*	*880,000*	*370,000*	*52,000*	*170*			
1 Improved Inter-Urban Connections	-5,000	10,000	15,000	2,500	600	1,000	90	-1	2,870	90	High
2 Reducing Congestion and Improving Sustainable Connectivity in Oxford Urban Area	-35,000	4,000	12,000	15,000	100	-200	-20	-8	910	50	Medium
3 Reducing Congestion and Improving Sustainable Connectivity in Swindon Urban Area	-20,000	2,000	15,000	15,000	800	800	90	-3	300	20	Medium
4 Better Connecting Market Towns, Innovation Hubs, and Rural Areas	-10,000	4,000	5,000	2,500	300	800	45	-1	410	20	High
5 Moving Freight More Effectively	5,000	-	-	-	300	400	40	1	1,090	30	Low
6 Creating a Sustainable Integrated Transport Network	-10,000	-	15,000	10,000	300	400	35	-10	40	5	Low
Combined Impact	**-75,000**	**20,000**	**62,000**	**45,000**	**2,400**	**3,200**	**280**	**-22**	**£5,620**	**£215**	
% Change vs BAU 2049	-6%	+67%	+52%	+11%				-13%			

River Thames, Abingdon (Steer)

Next Steps

Funding

There are several funding sources to potentially support infrastructure investment in the EEH region.

These funding sources, identified below, vary in the likely amount of funding they will generate, and the challenges associated with their implementation. Additionally, new funding sources may emerge in response to environmental, economic, and social changes over the life of EEH's Transport Strategy.

Potential funding sources include:

- **Central Government** funding, e.g., Housing Infrastructure Fund, Transforming Cities Fund Rail Enhancement/Renewals funding, e.g., Rail Network Enhancements Pipeline

- **National Roads Fund**, e.g., Roads Investment Strategy, Major Road Network

- **Third party contribution**, e.g., from major private sector investors, land/asset owners, and developer contributions (including S106 agreements)

- **Local rates/levies**, e.g., Business Rate Supplement

It is recognised that funding is nationally challenging, and therefore a range of funding models will need to be analysed and considered.

EEH is now seeking to develop an investment pipeline, considering our technical study programme to date. The outputs of the connectivity study will be taken into account as we develop our investment pipeline over the coming months.

The overall aim of the investment pipeline is to bring together EEH's investment interventions into one place. It will identify where investment is required, based on a matrix approach, primarily considering strategic cross-border opportunities and interventions which provide significant benefits to the region, should a regional funding allocation for transport infrastructure be forthcoming from Government.

Local strategy alignment

The connectivity studies (and future investment pipeline) provide a strategic narrative and evidence for Local Authorities in the development of their work.

The Department for Transport is soon expected to release new guidance on the development of Local Transport Plans (LTPs), which consider the future shape of local transport. The outputs of the connectivity studies can be fed into the strategic narrative and development of any new or updated LTPs, with the studies highlighting interventions that are regionally supported and provide strategic benefits, not only the Local Authority, but across the Heartland region.

Governance

The following groups are part of the EEH governance process and are key to the successful development of this study.

Based around these groups, EEH will consider its governance structure for onward delivery of interventions recommended as part of this study and the wider Connectivity Study programme.

Inform	Involve and Engage	Validate and Support
The **Transport Officer Group (TOG)** is composed of Head of Service or Senior Officer level representation and provides technical oversight of EEH general governance. Engagement with the TOG is led by EEH and they were kept informed throughout the development of the connectivity study through reports supplied by EEH Programme and Project leadership. The group meets monthly. The TOG was kept informed on progress and key lessons learnt. The members of this group may also be members of the **Steering Group**. It was comprised of representatives from local authority partners, local enterprise partnerships and partner transport authorities.	The **Steering Group** provides study governance, checking and challenging each phase of the study and ensuring the studies progress in the right direction. The Steering Group was composed of representatives of the partner transport and planning authorities across the study area as well as representatives of local enterprise partnerships, the DfT, National Highways and Network Rail. The **Stakeholder Group** represents key interest groups that are critical to the successful delivery of the Connectivity Studies and are essential to involve from the outset. This group was engaged on matters such as study objectives, corridor connectivity issues, opportunities and options. It was composed of transport operators, transport users, road users, non-motorised users, environment bodies, Homes England and utility groups.	The **Strategic Transport Leadership Board** is composed of local authority leaders (or their nominated cabinet member substitute) and senior supporting officers. It provides decision making on key EEH actions and/or final outputs including the approval and publishing of reports, strategies and studies. The Strategic Transport Leadership Board receive reports, consider, feedback and approve the documents. It was essential they are kept engaged in the development of the Connectivity Study reports. This forum, including issued papers, are accessible by members of the public who could register to be an observer or ask questions.

Delivery Plan

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

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

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

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

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

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

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

Developing the EEH Investment Pipeline

As the sub-national transport body for the region**, EEH will continue to lead on development of the regional investment pipeline**, working with officers and the Strategic Transport Leadership Board to scope its onward development.

The Connectivity Studies, alongside other technical work currently being commissioned by EEH, will also inform the investment pipeline.

Consideration of risks

EEH will seek to apportion or share the different types of risks between parties, with risks allocated to the party best placed to manage them subject to achieving value for money.

The delivery of the investment pipeline and each element should be set in a way that allocates risk appropriately across contracts; incentivises the intended outcomes in terms of performance, efficiency and innovation; facilitates the delivery of the project to time and budget; and secures the targeted economic, social and environmental benefits of the project as discussed with stakeholders and agreed with decision makers.

Newbridge Square, Swindon (EEH)

Appendix A: Full List of Interventions

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

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

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

- **Medium term** schemes were judged to have a construction start date between 2033 and 2040.

- **Long term** schemes were judged to have a construction start date from 2041 onwards.

Intervention	Package(s)	Indicative timeframe
A338 Bus Priority Measures *Reduced bus journey times and improved reliability, with schemes including integration with new Wantage and Grove Railway Station, and bus priority on A338 northbound to Frilford.*	**4**, 6	*Short term*
A34 Bus Priority Measures *Measures between Abingdon and Oxford to reduce bus journey times, improve reliability and facilitate the introduction of new express bus services, including:* • *Capacity improvements at the Hinksey Hill / A34 interchange to better facilitate the movement of express bus services through this junction (options include the extension of the northbound slip road, with bus priority and the provision of an additional bus lane eastbound on the A423 Southern Bypass Road between Hinksey Hill Interchange and the Kennington Roundabout)* • *New bus lane on the A34 between Lodge Hill and Hinksey Hill.* • *Capacity improvements and bus priority measures at and on approach to the A4130/A34 Milton Interchange*	**1**, 2, 4, 6	*Short term*
A34 Corridor Mobility Hubs *Reduce car dependency and alleviate congestion on and around the A34 corridor through a series of mobility hubs to encourage use of more sustainable modes such as public transport, cycling, and or micromobility for all or part of journeys. Sites will include electric vehicle charging with the scale and mix of modes determined by the needs of each of the following five locations:* • *A34 Milton Interchange or Steventon* • *Harwell Campus, close to the A34 Chilton Interchange* • *Near Marcham that can intercept cars travelling towards Oxford and Abingdon* • *Near Radley that can intercept cars travelling towards Abingdon-on-Thames*	1, **4**, 6	*Medium term*
A34 Junction Improvements *Traffic flow improvements (in additional to committed work from National Highways) at the following key junctions along the A34 corridor to reduce localised congestion and improve journey time reliability for local and express bus services in particular:* • *Hinksey Hill Interchange* • *Chilton / Harwell Interchange* • *Milton Interchange*	**1**, 5	*Medium term*
A34 Road Safety Improvements *Safety improvements along A34 at known junction hotspots and where there are adjacent active travel routes, potentially including speed cameras, average speed cameras and reduced speed limits in high casualty areas to improve road user safety and reduce delays from accidents.*	**1**, 4, 5	*Medium term*

Intervention	Package(s)	Indicative timeframe
A4074 Corridor Mobility Hubs and Bus Priority Measures *Reduce car dependency and alleviate congestion on and around the A4074 corridor through a mobility hub facility with electric vehicle charging at Golden Balls Roundabout or Berinsfield or Sandford (supported through bus prioritisation in the northern section of the A4074, possibly in the form of a new bus lane in the northern section just outside Oxford and or New bus lanes along the A4074 between Dorchester, Berinsfield, Golden Balls and Nuneham Courtenay) to encourage use of more sustainable modes such as public transport, cycling, and or micromobility for all or part of journeys and relieve pressure on A34.*	2, **4**, 6	*Medium term*
A415 Bus Priority and Air Quality Measures *Measures between Kingston Bagpuize and Abingdon to reduce bus journey times, improve reliability and facilitate the introduction of new express bus services, including:* • *Bus priority in both directions along Marcham Road / Ock Street.* • *Bus priority at the A415 / A338 priority junction in Filford* • *Improve air quality on the A415 through Marcham village where there is an AQMA*	**4**, 6	*Short term*
A419 Junction Improvements *Traffic flow improvements (in additional to committed work from National Highways) along the A419 corridor west of Swindon to reduce localised congestion and improve journey time reliability for local and express bus services in particular. Junction with A420 included in A420 Junction Improvements.*	**3**, 5	*Medium term*
A419/A417 Strategic Travel Demand Management Pilot *Development of a strategic approach to travel demand management for the A419 corridor from J15 M4 to M5 J11a (Gloucester). This highly proactive travel demand management approach will look at the role for public transport and sustainable modes linking Swindon, Cirencester and Gloucester/Cheltenham in parallel with the mobilisation of the A417 Missing Link project near Gloucester. This will look at the aggregate impacts and opportunities arising from new development and induced traffic, as well as the role of sustainable transport options in 'normal' conditions and in the event of unforeseen disruption events on this corridor.*	1, **4**	*Short term*
A420 Bus Priority Measures *Measures between Swindon and Oxford to reduce bus journey times, improve reliability and facilitate the introduction of new express bus services, including:* • *Upgrades to all stops services by existing S6 service between Oxford and Swindon* • *Bus priority between Cumnor and Oxford* • *Bus priority at Coxwell Road junction south of Faringdon* • *Bus priority at Whitney Road roundabout in Kingston Bagpuize* • *Cumnor Interchange in Botley (e.g., mode filter on Cumnor Hill and / or road space reassignment on Cumnor Hill Bypass)* • *Bus priority at Charney Road junction near Southmoor*	**1**, 2, 3, 4, 6	*Short term*

Intervention	Package(s)	Indicative timeframe
A420 Junction Improvements *Traffic flow improvements (in additional to committed work from National Highways) at the following key junctions along the A420 corridor to reduce localised congestion and improve journey time reliability for local and express bus services in particular:* • *Signalisation of A420/ Coxwell Road junction* • *New roundabout at junction of A420 / Highworth Road to facilitate new development* • *Improvements to the signage at the A420 / Park Road junction* • *Improvements to the A420 / A34 Botley Interchange and approaches* • *Pinch point improvements along the A420 near the A419, Watchfield, Faringdon and Appleton* • *Capacity improvements at Coxwell Road junction in Faringdon, including possible signalisation of new roundabout* *Improvements to around Acorn Railway Bridge (including future proofing for possible four tracking of Great Western Main Line and New Railway Station to East of Swindon)*	**1**, 2, 3, 4, 5	*Medium term*
A420 Road Safety Improvements *Safety improvements along A420 at known junction hotspots and where there are adjacent active travel routes, potentially including speed cameras, average speed cameras and reduced speed limits in high casualty areas to improve road user safety and reduce delays from accidents.*	**1**, 4, 5	*Medium term*
A420 Mobility Hubs *Reduce car dependency and alleviate congestion on and around the A420 corridor through a series of mobility hubs to encourage use of more sustainable modes such as public transport (particularly to integrate with improved S6 bus service), cycling, and or micromobility for all or part of journeys. Sites will include electric vehicle charging with the scale and mix of modes determined by the needs of each of the following five locations:* • *Bassels Leigh or Kingston Bagpuize* • *Southmoor with potential locations including Charney Bassett Turn* • *On A420 south of Faringdon with potential locations including Coxwell Road* • *Shrivenham with potential locations including Highworth Road or Pennyhooks Lane* • *Watchfield*	**1**, 2, 3, 4, 6	*Short term*
Bus Improvements to S6 Service (Oxford to Swindon via Faringdon) *Travel time and frequency improvements to service that currently serves Oxford, Bassels Leigh, Southmoor, Buckland, Faringdon (3min stop), Watchfield, Shrivenham, Stratton Park and Swindon enabled by bus priority and road safety improvements on A420. Assumed to include Improved Inter-Urban Bus Frequency, integration with existing and proposed mobility hubs, with additional vehicles and drivers to provide extended operating hours based on minimum 15 minute frequency throughout the day (currently only 15min at peak times) and increased availability of bus services in early morning, late evenings and at weekends. Could also include introduction of express services making no or fewer stops, and possibly not leaving the A420.*	**1**, 2, 3, 4, 6	*Short term*

Intervention	Package(s)	Indicative timeframe
Bus Priority Measures in Swindon *Measures in Swindon urban area to reduce bus journey times, improve reliability and facilitate the introduction of new services, including:* • *New northern bus quality corridor (partially constructed)* • *New bus quality corridor between Wichelstowe and Swindon town centre* • *New bus quality corridor between the New Eastern Villages development and the centre of Swindon (To be delivered as a part of the New Eastern Villages development)* • *New western bus quality corridor* • *Re-routing of bus services via Fleet Street to link into the new Bus Boulevard on Fleming Way* • *Bus priority at Bourton Turn-Acorn Bridge-Greenbridge (possible options include on-line to Acorn Bridge, off-line through Great Stall, A419 Great Stall Bridge or Swindon Oxford Road on-line bus lane).* • *Enhanced bus-rail connectivity to / from Swindon Station (e.g., improved station forecourt)*	**3**, 6	*Short term*
Bus Rapid Transit in Oxford *New bus rapid transit system building on and incorporating existing services in Oxford (alternative to Mass Rapid Transit / Metro options) enabled by bus priority measures, with additional vehicles and drivers to provide high frequency bus system in and around Oxford, connecting with key employment areas, city edge sites and proposed / existing mobility hubs.*	**2**, 6	*Medium term*
Bus Rapid Transit in Swindon *New bus rapid transit system building on and incorporating existing services in Swindon to capitalise on proposed bus priority measures with additional vehicles and drivers to provide high frequency bus system in and around Swindon connecting key employment areas, city edge sites and proposed / existing mobility hubs.*	**3**, 6	*Medium term*
Cherwell Valley Line Capacity Improvements between Oxford and Didcot *Increasing rail capacity for additional and faster passenger and freight services, with schemes including an increase from two to four tracks between Kennington Junction (Oxford) to Radley, Junction improvements and additional platform at Didcot Parkway as detailed in 2021 Network Rail Oxfordshire Rail Corridor Study.*	**1**, 2, 4, 5, 6	*Medium term*
Cherwell Valley Line Electrification between Oxford and Didcot *Increase rail capacity and substantially reduce emissions, noise, and air pollution through extension of 25kV overhead electrification north from Great Western Main Line to at least Oxford Railway Station. Combined with Cherwell Valley Line Capacity Improvements between Oxford and Didcot to allow more rail services to operate, including possible extended East West Rail services between Oxford and Swindon, with costs should consider accommodation of four track between Oxford and Radley from this intervention and noted in 2021 Network Rail Oxfordshire Rail Corridor Study.*	**1**, 2, 4, 5, 6	*Medium term*

Intervention	Package(s)	Indicative timeframe
Community Transport Optimisation *This workstream looks at the role and function of community transport organisation based in or serving Swindon from surrounding areas. The scope focuses on ways to maximise the efficiency of these community transport operators as 'family' of services, avoiding duplication of journeys and maximising connectivity to bus/mobility hubs and rail stations. It also explores the role of CT operations and fleet in serving new development ahead of conventional services to capture customers at the outset. The workstream examines the role of CT in enabling access to key services by younger people, and also provides accessibility for new developments catering for elderly users and others with access needs.*	**6**	*Short term*
Connecting New Communities projects *Based on a successful engagement model piloted in Gloucestershire, the Connecting New Communities package will look at creative ways to influence travel choice for new residents to Swindon, building on the residential and workplace travel plans secured voluntarily and through the planning process. The model will look at ways to embed transport and access issues into conversations with new residents through events and other outreach activities, working in partnership with bus and rail operators, cycling and walking groups, community groups, public health and other local authority functions. This will ensure that access needs of these new communities are properly captured, understood and acted upon as new bus services and connections are delivered. The package will also dovetail with the Swindon Travel Choices programme.*	**6**	*Short term*
Developing Local Logistics Partnerships *Setting up partnership arrangements working with SME and large logistics operators to work together in the areas of freight travel planning, carbon reduction, 'last mile' delivery and collaborating on ways to reduce freight carbon miles strategically and locally. Also, to provide a mechanism to address local issues on routing, delivery patterns and 'neighbour' impact of freight transport.*	**5**	*Short term*
Developing a Local Logistics Partnership in Swindon *Setting up of a partnership arrangement working with SME and large logistics operators in the Swindon area. The forum will work together in the areas of freight travel planning, carbon reduction, 'last mile' delivery and collaborating on ways to reduce freight carbon miles strategically and locally. It will also provide a mechanism to address local issues on routing, delivery patterns and 'neighbour' impact of freight transport. The terms of reference and initial meetings are planned for Spring 2023 and build on the EEH Freight Study (2019) and other best practice in the freight and logistics sector.*	**3**, 5	*Short term*
Dynamic Car Park Pricing based on demand to make best use of existing facilities *Reduce demand for car parking, local road congestion, and the need for the construction of additional car parking facilities, and encourage users to shift to more sustainable modes, with schemes to set car parking pricing in urban areas based on levels of demand across each day.*	2, 3, 6	*Medium term*

Intervention	Package(s)	Indicative timeframe
Encouraging Freight from A420 to Strategic Road Network *Reduced use of A420 and nearby local roads by freight vehicles not travelling to or from the area, with schemes including traffic management / calming measures along the A420 between Oxford and Swindon to reduce rat-running through local villages, with due consideration to impact on emissions as well as pushing additional HGVs on to both the M4 and A34 and what that means from the safe running of those routes.*	1, **5**	*Medium term*
Enhanced Rail Freight Terminal at Swindon *Reduce congestion on A420 and other roads through shift of additional freight to rail, with schemes including new parkway freight terminal at South Marston for Swindon, with the option to support a new large logistics park being close to the site of the former Honda factory at Swindon.*	3, **5**	*Medium term*
Expansion and development of car club schemes in urban and rural locations *Access to transport provided to rural and other areas not suitable for regular bus or rail services, with schemes including car club provision on all new developments exceeding 100 dwellings.*	**4**, 6	*Short term*
Expansion of Bus Rapid Transit between Oxford and Science Vale *Reduced congestion and facilitating mode shift to public transport by building on and incorporating existing services to capitalise on proposed A34 and A4074 bus priority measures with additional vehicles and drivers to provide improved public transport connections and frequency between Oxford and innovation campuses such as Harwell.*	**1**, 2, 4, 6	*Short term*
Expansion of the Electric Vehicle Charge Point Network *Increased shift to fully electric vehicles, with schemes including expansion of charging locations with a focus on rapid and ultra-rapid charging along the Strategic Road Network and Major Road Network in addition to those already installed or planned for new or upgraded mobility hubs.*	1, 2, 3, 4, 5, **6**	*Short term*
Extension of Birmingham/Banbury Services beyond Oxford to/from Swindon and Bristol *Additional train services through extension of 1tph service from Birmingham/Banbury beyond Oxford to Swindon (or Bristol) if sufficient capacity on Great Western Main Line, enabled by Cherwell Valley Line additional capacity and electrification.*	**1**, 2, 3, 4, 6	*Medium term*
Extension of East West Rail Services beyond Oxford to/from Didcot, Swindon and Bristol *Additional train services through extension of 1tph East West Rail service from Milton Keynes / Cambridge beyond Oxford to Didcot, with possible extension to Swindon (or Bristol) via Wantage and Grove if sufficient capacity on Great Western Main Line, enabled by Cherwell Valley Line additional capacity and electrification. May include interim extension to/from Didcot Parkway only.*	**1**, 2, 3, 4, 6	*Medium term*

Intervention	Package(s)	Indicative timeframe
Extension of Great Western Main Line Dynamic Passing Loop *Additional rail capacity on Great Western Main Line through the extension of a third track west of Challow towards Shrivenham from the existing four track section (at the location of the planned Wantage and Grove Railway Station) to provide an increase in freight services and a new passenger service as a dynamic passing loop in the up direction between Shrivenham and Knighton Crossing (based on study for Network Rail by MDS Transmodal (2020)). May be combined with four tracking through to and beyond New Parkway Station East of Swindon to avoid conflict with long distance services.*	**1**, 3, 5	*Medium term*
First Mile / Last Mile Sustainable Freight Delivery *Reduced local congestion, air pollution and emissions, with schemes including freight consolidation centres, increased use of walking, cycling, and small electric vehicles to provide the initial and final aspects of freight collection and delivery.*	2, 3, 4, **5**, 6	*Short term*
Highway Capacity and Connectivity Improvements in Didcot *Reduce congestion and improve journey times and reliability, with schemes complementing and enabled by committed Didcot Science Bridge including the Didcot Central Corridor project and roll-out of Urban Traffic Management and Control (UTMC).*	**4**, 5	*Medium term*
Highway Capacity and Connectivity Improvements in Highworth *Reduce congestion and improve journey times and reliability, with schemes including capacity improvements at junctions along the B4019 in Highworth.*	**4**, 5	*Medium term*
Highway Capacity and Connectivity Improvements in Swindon *Reduce congestion and improve journey times and reliability, with schemes including work to address:* • *The Corporation Street bottleneck,* • *Highway improvements in the Rodbourne area,* • *Highway improvements along the Farnsby Street / Milton Road corridor,* • *Highway improvements along the Station Road / Holbrook Way corridor,* • *Highway improvements along the Commercial Street / Cromby Street corridor,* • *New sustainable transport link between the NEV and Merlin roundabout.*	**3**, 5	*Medium term*
Improved Bus Service Between Didcot, Cowley and Headington *Reduced congestion from planned development and increased mode shift to public transport through new or improved inter-urban bus service using Science Vale Bridge to serve areas to the west of A34 between Didcot and Headington, with integration at Didcot Parkway Station, Culham Railway Station and Science Park, Golden Balls mobility hub, Oxford Science or Business Park Stations, and Headington hospital precincts (with possible connection through to Thornhill mobility hub), extended operating hours based on minimum 15 minute frequency, and increased availability of bus services in early morning, late evenings and at weekends.*	1, 2, **4**, 6	*Short term*

Intervention	Package(s)	Indicative timeframe
Improved Bus Services Connecting Science Vale and New Wantage and Grove Railway Station *Travel time and frequency improvements to existing service enabled by bus priority and road safety improvements, with additional vehicles and drivers to provide minimum 15 minute frequency between new railway station on Great Western Main Line, Wantage / Grove, Harwell Science and Research Campus Didcot and Swindon, and increased availability of bus services in early morning, late evenings and at weekends.*	**4**, 6	*Short term*
Improved Connectivity Between Rail and Bus Services *Increased attractiveness and use of public transport journeys using multiple modes through improved integration of bus and rail timetables, improved connections between bus routes and station, and integrated ticketing between modes.*	1, **6**	*Short term*
Improved Digital Connectivity in Urban and Rural Areas *Reduce demand for travel from those making journeys due to poor or unreliable digital connectivity and improve connection reliability for public transport users, with schemes including continued rollout of 5G technology.*	1, 2, 3, **4**, 6	*Short term*
Improved Wayfinding Information for all modes *Improved usability of public transport and active travel for those without existing local knowledge, with schemes including additional and updated signage, maps and other information to assist with navigation in and between local areas.*	1, 2, 3, 4, **6**	*Short term*
Local Transport Authorities to Develop Enhanced Partnerships or Franchising Arrangements *An Enhance Partnership is a statutory partnership between one or more Local Transport Authorities and their local bus operators that sets out how they will work together to deliver Bus Service Improvement Plan (BSIP) outcomes in the defined geographical area.*	1, 2, 3, 4, **6**	*Short term*
M4 / A34 Priority Freight Route Study *Development of clear action plan and infrastructure pipeline for freight moving between and beyond Oxford and Swindon via M4 / A34 route, with elements to include HGV movements, layby improvements, weight restrictions, etc.*	1, **5**	*Short term*
New Cycle Route between Berinsfield and Oxford *Improved active travel connectivity of Oxford Science Park, with schemes including a new route alongside part of the A4074 or an off-line route via existing upgraded bridleways that follow the Roman Road from Berinsfield to Grenoble Road.*	**2**	*Short term*

Intervention	Package(s)	Indicative timeframe
New Parkway Station East of Swindon *Congestion in Swindon, on A420 and other local roads from planned housing development avoided through provision of a new local two platform railway station as an additional stop on the Great Western Main Line, with scheme elements including integration with new mobility hub facility, active travel links (including and beyond New Eastern Villages Development), and possible increase from two tracks to avoid conflict with long distance services.*	1, **3**, 6	*Medium term*
New Mobility Hubs serving Oxford *Reduce car dependency and alleviate congestion within Oxford urban area through additional mobility hubs to encourage use of more sustainable modes such as public transport, cycling, and or micromobility for all or part of journeys. Sites will include electric vehicle charging with the scale and mix of modes determined by the needs of each of the following two locations:* • *Transport hub at Cumnor on the A420* • *Transport hub at Lodge Hill junction of A34 and Oxford Road (A34 (south)*	1, **2**, 6	*Medium term*
New Mobility Hubs serving Swindon *Reduce car dependency and alleviate congestion within Swindon urban area through additional mobility hubs to encourage use of more sustainable modes such as public transport, cycling, and or micromobility for all or part of journeys. Sites will include electric vehicle charging with the scale and mix of modes determined by the needs of each of the following four locations:* • *Orbital Shopping Park Mobility Hub* • *Great Western Hospital Mobility Hub or M4 Junction 15 (Marlborough Road) Mobility Hub* • *Old Town Mobility Hub* • *Swindon West (M4 Junction 16) Mobility Hub*	**3**, 6	*Short term*
New Wantage and Grove Railway Station *Congestion on A338, A417, B4494, B4507, and other local roads from planned housing development avoided through provision of a new local two platform railway station and mobility hub as an additional stop on existing four track section of the Great Western Main Line, with scheme elements including integration with local bus and active travel routes, and EV charging provision.*	**4**, 6	*Short term*
Oxford Traffic Filters (to prioritise sustainable transport modes) *Implementation of bus priority traffic filters as part of Oxford's Core schemes at Hollow Way, Hythe Bridge Street, Marston Ferry Road, St Clements, St Cross Road, and Thames Street.*	**2**, 6	*Short term*
Oxford Local Cycling and Walking Plan (LCWIP) / Active Travel Improvements *Improve access to high quality walking and cycling routes, with schemes including those in the Oxford Local Cycling and Walking Plan (LCWIP), intra-urban cycle routes that connect Oxford's mobility hub sites with Oxford City Centre, routes that connect Oxford Parkway with surrounding settlements, and new inter-urban cycle routes that connects Oxford with surrounding settlements.*	**2**, 6	*Short term*

Intervention	Package(s)	Indicative timeframe
Oxford Railway Station Improvements (later stages) *Improved connections to and from Oxford, with schemes including added commercial space and improved multimodal interchange facilities as detailed in Network Rail Oxford Corridor Phase 2 study.*	1, **2**, 6	*Medium term*
Oxford Workplace Parking Levy *Reduce demand for car parking and encourage users to shift to more sustainable modes, with schemes to apply a charge on employers and education organisations for the number of parking places they provide.*	**2**	*Short term*
Oxford Zero Emission Zone (ZEZ) Expansion *Improve air quality, cut carbon emissions, and move towards zero emission travel in the city through expansion of existing ZEZ pilot area to apply a daily charge to all petrol and diesel vehicles, including hybrids, if they are driven in the zone between 7am and 7pm unless they have a 100 per cent discount or exemption.*	**2**	*Short term*
Railway Station Access and Accessibility Improvements at Appleford (minor works) *Minor works to improve access to existing and additional rail services at Appleford Railway Station, with schemes including improvements that provide step-free access to all platforms, and mobility hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking.*	**4**, 6	*Medium term*
Railway Station Access and Accessibility Improvements at Culham (major works) *Significant works to improve access to existing and additional rail services at Culham Railway Station to support its importance as a hub for employment sites and planned strategic housing sites at Culham and Berinsfield, with schemes including improvements that provide step-free access to all platforms, and mobility hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking.*	**4**, 6	*Medium term*
Railway Station Access and Accessibility Improvements at Didcot *Improved access to existing and additional rail services at Didcot Railway Station, with schemes including mobility hub elements including improved cycle parking quality and quantity, improved integration with local bus services, and increased EV charging provision for any parking.*	**4**, 6	*Medium term*
Railway Station Access and Accessibility Improvements at Radley *Improved access to existing and additional rail services at Radley Railway Station, with schemes including providing step-free access to all platforms (currently only available for Oxford bound services), and mobility hubs elements including improved cycle parking quality and quantity, improved integration with local bus services, and EV charging provision for any parking.*	**4**, 6	*Medium term*
Real Time Passenger Information Online and at Stations and Bus Stops *Encourage mode shift to public transport through provision of real time information on services similar to TfL in London.*	2, 3, 4, **6**	*Short term*

Intervention	Package(s)	Indicative timeframe
Reduced Public Transport Fares *Increased attractiveness and use of public transport journeys by reducing the cost paid for by users and or subsidising operators to cover less profitable routes or frequencies.*	**6**	*Medium term*
Reopening of Cowley Branch Line to Passengers *Increased access to sustainable mobility within and to/from Oxford through construction of new stations at Oxford Science Park and Oxford Business Park on existing Cowley Branch Line (currently used for Freight) to allow for 2tph passenger services from London Marylebone via Oxford, and also support planned strategic housing sites at Grenoble Road and Northfield Farm.*	**2**, 6	*Medium term*
Rural and Inter-Urban Active Travel Improvements *Improved access to high quality walking and cycling routes, with schemes including those in Local Cycling and Walking Plans (LCWIPs) for Abingdon, Didcot, Kidlington, and Wantage and Grove, along key A road corridors (A338, A415, A417, A420), improvement schemes in Kidlington, and between Abingdon and Culham, Berinsfield and Culham, Grove and Faringdon, Grove and Shrivenham, Grove and Oxford, across the Science Vale Cycle Network, and other possible combinations of routes connecting Swindon and Oxford. Also includes possible Wilts and Berks Canal restoration.*	**4**, 6	*Short term*
Rural Demand Responsive Transit (DRT) Service *Access to public transport provided to rural and other areas not suitable for regular bus or rail services, with schemes including on demand bus services connected to key Mobility Hubs such as railway stations.*	**4**, 6	*Short term*
Safeguarding for Aggregate & Rail Freight Terminal at Appleford *Reduce congestion on A34 and other roads through shift of additional freight to rail, with schemes to support a new large logistics park being created on the site of existing Sutton Courtenay Quarry and Recycling Centre south of Appleford Railway Station if the location is vacated.*	4, **5**	*Short term*
Safeguarding for Rail Freight Terminal at Cowley *Reduce congestion on A34 and other roads through shift of additional freight to rail, with schemes to support a new large logistics park being created on the site of existing BMW production location in Cowley if the location is vacated.*	2, 4, **5**	*Short term*
Station Travel Plans and Access Strategies *Refresh of the Swindon Station Travel Plan working in close collaboration with GWR, Network Rail and other partners with a focus on reinforcing the role of the station as a mobility hub. This will look at the station masterplan, its surrounding catchment, walking and cycling connectivity, missing links, waymarking, and integration with bus, taxi and public transport. This will also look at the role of last mile information, inclusive mapping and travel choice information to promote rail. Consideration of suppressed rail passenger markets and the opportunities to improve direct accessibility to the station (including from new developments) will be an integral part of this approach. The relationship with Swindon's Fleming Way scheme (bus boulevard) will also be covered.*	**3**, 6	*Short term*

Intervention	Package(s)	Indicative timeframe
Swindon Local Cycling and Walking Plan (LCWIP) / Active Travel Improvements *Improve access to high quality walking and cycling routes, with schemes including those in the Swindon Local Cycling and Walking Plan (LCWIP), new routes to connect with Swindon Railway Station combined with improved cycle parking quality and quantity, new inter-urban cycle routes that connects Swindon with surrounding settlements, and Implementation of new micro-mobility schemes in Swindon (e.g., e-scooters, cycle hire etc).*	**3**, 6	*Short term*
Zero Emissions Buses *Reduce local air pollution, noise and emissions through introduction of zero emissions vehicles across all routes in study area.*	6	*Medium term*

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