



South Central Radial Area Study Options Assessment Report

Version 2.0 October 2021

## Contents

Part 1	Introduction	3
	Context	4
	Process	5
	Structure of this Report	6
Part 2	Background	7
	The South Central Radial Area	8
	Major Economic Hubs & International Gateways	9
	Corridors and Local Planning Authorities	10
	Key Actors	11
	Stakeholder Engagement	12
Part 3	Vision, Objectives, &	
	Problem Statements	13
	Background	14
	Current Challenges & Opportunities	15
	Vision	23
	Objectives	24
	Problem Statements	26

Part 4	Long List Generation & Assessment	27				
	Overview	28				
	Long List Generation & Typologies	29				
	Strategic Assessment	30				
	Economic Assessment	33				
	Deliverability Assessment	36				
	Assurance and Moderation	39				
Part 5	Package Development	40				
	Combined Approach to Package Development	41				
	Vision for the South Central Radial Area Study	42				
-	Key Elements in the Vision	43				
	Packages & Options Assessment Results	44				
Part 6	Package Modelling					
-	Introduction to SEELUM	54				
<u>-</u>	Approach to Modelling Packages in SEELUM	57				
	Modelling Results Overview	61				
	Modelling Results Details	63				
2	Trade Offs	67				
	Alignment to Problem Statements & Objectives	69				
Part 7	Next Steps	71				
	Recommendations	72				
	Delivering our Vision	73				
	Next Steps	74				
Appendix A	Problem Statements	75				





# Part 1 Introduction

## Context

Transport for the South East (TfSE), in their role as the Sub National Transport Body for South East England, are delivering a programme of five Area Studies that will prioritise interventions that help deliver TfSE's vision for the South East. This is a key step towards developing a Strategic Investment Plan to secure funding for the South East's transport network.

#### **Geographical Scope**

The Area Studies focus on the key transport corridors that serve and connect the South East's Major Economic Hubs and international gateways. They also play an important national role in connecting the rest of the UK to some of the busiest ports in the country.

The areas are defined as follows:

- Outer Orbital Area Study encompassing the strategic corridors that follow the coastline from the New Forest, in Hampshire, towards East Kent.
- Inner Orbital Area Study encompassing the strategic crossregional routes around the southern outskirts of London.
- South Central Radial Area Study encompassing the corridors that share the London-Gatwick corridor in the north and fan out in the south to connect much of the Sussex coastline to the capital.

- South East Radial Area Study encompassing the transport corridors connecting the Channel Tunnel and Port of Dover to London, as well as serving Kent, Medway, and East Sussex.
- South West Radial Area Study encompassing the strategic highways between London and the South West, as well as parts of the Great Western Railway and South Western Mainline. It also includes the strategically important cross-Solent links with the Isle of Wight.

#### **Technical Scope**

Each of the Area Studies investigate the issues, challenges and opportunities identified within TfSE's transport strategy in more detail. They also identify a shortlist of interventions to make life better for people, for businesses and, for the environment of the South East.

The outcome of these Area Studies will form the 'blueprint' for TfSE's Strategic Investment Plan. This will influence and help shape investment decisions by government and national bodies, such as Network Rail and National Highways, and local bodies, including Local Transport Authorities.



This report provides a summary of the work undertaken in the third of the five stages underpinning the South Central Radial Area Study (Stage C). **Figure 1.1** below shows the stages and steps that are being delivered for this study.

# The South Central Radial Area Study comprised five Stages, which in turn are formed of twelve steps.

The first stage, **Stage A (Mobilisation)**, was completed in January 2020. This stage helped define the leadership team, partners, Subject Matter Experts, methodology and a Delivery Plan for the technical programme.

Figure 1.1: Overview of the South Central Radial Area Study process

This led onto **Stage B (Evidence Base)**, which undertook an in-depth review of the current and future issues and opportunities in the South Central Radial Area. This covered a wide range of economic, social and environmental issues and opportunities.

Stage B also identified corridor specific transport issues and defined the study's Vision, Objectives, and Problem Statements.

At the time of writing, the Study has just completed **Stage C (Options Generation and Assessment)**, and this is the focus of this report.

Stage C will be followed by **Stage D (Further Appraisal)**, in which area and delivery plans for the identified options will be developed.

#### Stage E (Integrated Sustainability

**Appraisal)**, which runs concurrently with all stages, will seeks to ensure objectives, problem statements and interventions can be achieved through sustainable measures.





#### Purpose

This report summarises the process the Project Team executed to:

- Develop a long list of interventions (and options within some interventions).
- Qualitatively assess each intervention against a set of strategic, economic, and delivery criteria.
- Use the qualitative assessment outlined above to develop coherent packages of interventions.
- Model these interventions using a land use transport model.
- Quantitively assess the impact of these packages on transport and socioeconomic and environmental outcomes for the South Central Area.
- Understand trade offs and, working with key stakeholders, refine, justify, and agree a short list of packages to be taken forward for further appraisal in the next stage of this study.

## Structure and Contents

#### The rest of this report is set out as follows:

- **Part 2** describes the background to this report and how it was developed
- Part 3 describes the key issues and opportunities the South Central Radial Area Study seeks to address. These are articulated as a vision and set of objectives the study should seek to achieve, as well as a set of Problem Statements the study should address.
- Part 4 describes how the Project Team worked with TfSE and their stakeholders to develop a long list of interventions (and options within some interventions). It then describes how these interventions and options were assessed. In summary, each intervention was examined through three assessments. The first focussed on strategic and policy alignment, the second on economic impact (using DfT's EAST framework), and the third on deliverability.

- **Part 5** presents the results of the qualitatively assessment described in Part 4. It then shows how the Project Team grouped the best performing interventions into coherent Packages for modelling.
- Part 6 describes how the Project Team used a land use and transport model to model the transport and socioeconomic impacts of the Packages described in Part 5. This Part presents the results of this modelling exercise, comments on key findings, and discusses some of the trade offs highlighted by the modelling results.
- **Part 7** summarises the final short list of Packages to be taken forward for further appraisal in Part D and describes the next steps for this study. This will include a more detailed examination of the costs and benefits that could be generated by each Package.





# Part 2 Background

The South Central Radial Area is one of the most prosperous and dynamic areas of the South East. Its transport networks perform a key link between the Sussex Coast, the Gatwick Diamond, and London. It is home to some of the fastest growing communities in the UK. However, some communities and sections of society risk being left behind by the area's prosperity.

#### Profile

The South Central Radial Area links the largest conurbation in the UK (Greater London) with the second largest conurbation in the South East. The latter "Sussex Coast" built up area runs from Bognor Regis in the west to Eastbourne in the east. Brighton and Hove sits at the centre of this thriving conurbation.

Gatwick Airport – the busiest single runway airport in the world pre-COVID (46.6m passengers in 2019) – lies half- way between both conurbations. Gatwick supports a cluster of Major Economic Hubs that are known as the "Gatwick Diamond".

The area is also home to the North Downs, which lie between the Gatwick Diamond and London, and the South Downs, which lie between the Gatwick Diamond and Brighton. The location of these protected areas has heavily influenced development planning, and explains why significant growth is focussed on the Gatwick Diamond.

#### **Transport Networks**

The area's transport networks support significant north-south demand.

Rail demand is particularly intense between Gatwick Airport and East Croydon. Gatwick Airport enjoys the highest public transport mode share outside London, which reflects the quality of the rail service provided here.

There is a high-quality highway between the M25 London Orbital motorway (the M23 /A23) and the A27 South Coast expressway. Part of this highway has recently benefitted from investment in being upgraded to a Smart Motorway.

The area is home to several successful bus networks – including the Fastway Bus Rapid Transit network in Crawley, which has enjoyed triple digit percentage growth in the last decade. Bus services outside urban areas, however, have struggled to maintain market share.

#### **Key Challenges**

The South Central Radial area is a generally prosperous area. However, this prosperity. combined with development planning constraints, has resulted in the least affordable housing of all the areas included in the South East Area Study programme. To address the challenge, significant housing development is planned in the Gatwick Diamond area. This will place additional demand on the transport network, especially if employment growth is higher in London and Brighton than it is in the Gatwick Diamond area (which is guite likely as the aviation industry is still recovering from the COVID-19 pandemic). There are also significant challenges with resilience and east – west movements in this area.

This suggests transport investment will need to be targeted at interventions that support housing growth, deliver more sustainable transport outcomes, and strengthen the resilience of the area's transport networks.



## **Major Economic Hubs and International Gateways**

The South Central Radial Area encompasses a cluster of Major Economic Hubs on the Sussex Coast (Chichester, Bognor Regis, Worthing, Brighton and Hove, and Eastbourne), a cluster of Major Economic Hubs in the "Gatwick Diamond" area (Burgess Hill / Haywards Heath, Crawley / Gatwick, Horsham, and Redhill / Reigate), as well as Royal Tunbridge Wells in Kent and Epsom / Ewell in Surrey.





## **South Central Radial Area Study Corridors and Planning Authorities**

The South Central Radial Area Study encompasses the strategic radial corridors between South London and the Sussex coast. The Local Transport Authorities in this area include Brighton and Hove City Council, East Sussex County Council, Kent County Council, Surrey County Council, and West Sussex County Council. The Local Planning Authorities that are included in this area are labelled on the map below.





## **Project Team**

The South Central Radial Area Study is led by a TfSE Project Management Office and is supported by a Technical Advisor Team.

The Technical Advisor Team is led by **Steer**, who led the development of the Evidence Base (Stage B of this project).

Steer is supported by:

- Atkins, who led the Options Stages of the project (Stage C); and
- WSP, who provide significant support to the Delivery (Stage D) and Integrated Sustainability Appraisal (Stage E) stages.

Most of the technical work and content delivered for Stage C was developed by Atkins and Steer. Atkins developed the Multi Criteria Assessment Framework (MCAF) that was used to qualitatively assess proposed interventions. Steer developed the transport and land use model that was used to quantitively assess the Packages.

For the purposes of this report, TfSE's Project Management Office and the Steer/Atkins/WSP Technical Advisor Team are referred to as the 'Project Team'.

## Stakeholders

On the mobilisation of this study, TfSE and the Technical Advisor team undertook a stakeholder mapping exercise for the South Central Radial Area to categorise key organisations and individuals according to their interest and influence.

This exercise enabled TfSE to define four distinct tiers of stakeholder:

- Tier 1 Stakeholders have a direct interest and involvement in leading and supporting investment in the South Central Radial Area Study. These stakeholders include Local Transport Authorities (County Councils and Unitary Authorities), National Highways, Network Rail, a representative from a Local Enterprise Partnership, and the South Downs National Park.
- Tier 2 Stakeholders potentially have a direct influence over the success of the Area Studies via their development process or contents of the studies. This group includes Local Planning
  Authorities (Districts and Boroughs) transport service providers, other statutory bodies (e.g. Homes England and Environmental/Heritage bodies), and special interest groups such as environmental groups.
- Tier 3 Stakeholders are those parties that may influence Tier 1 and 2
   Stakeholders through their activities, including through the media/social media and public affairs. These include Town and Parish Councils, residents' groups, education and health providers, and representatives from youth councils.
- **Tier 4 Stakeholders** are any other stakeholders who have limited interest and/or influence in this work and will therefore not be directly engaged in the Area Study programme.



#### Tier 1 Stakeholders

Most Tier 1 Stakeholders were invited to join the South Central Radial Area Study Working Group and play a direct role in leading and shaping the study.

These stakeholders have helped TfSE develop the Vision, Objectives, and Problem Statements for the study.

These stakeholders provided significant input into the development of the long list of interventions that were assessed using the MCAF and have moderated the initial results from the MCAF long list assessment.

They also supported the strategic assessment of each intervention and advised on the extent to which each long listed intervention aligns with their organisation's priorities.

#### **Tier 2 Stakeholders**

Further (remaining) Tier 1 Stakeholders and all Tier 2 Stakeholders were invited to join the South Central Radial Area Forum.

At the time of writing, this Forum had met twice and plans to meet one further time.

The first workshop focussed on identifying stakeholder aspirations for the studies and understanding their perceptions of the strengths, weaknesses, opportunities, and challenges of the area.

The second workshop focussed on validating/amending the Vision, Objectives, and Problem statements developed by the Area Study Working Group. It also provided these stakeholders with an opportunity to contribute to the long list of interventions.

A third workshop, which is expected to focus on validating packages and delivery, will be held in Stage D of the project.

## **Other Stakeholders**

Members of Parliament (MPs) have been further engaged through a bespoke process led by TfSE.

This process engaged MPs on a wider portfolio of topics, including the Area Studies. Any insights drawn from these discussions (e.g., whether an MP supports or does not support a particular intervention) was incorporated into the policy alignment scores.

## Tier 3 and Tier 4 stakeholders were not directly engaged in this part of the study.

Any organisation that subscribes to TfSE's newsletter has received regular updates about the progress of each study. These stakeholders will also have an opportunity to engage with TfSE when the Draft Strategic Investment Plan is published for consultation.





# Part 3 Vision, Objectives and Problem Statements

## Background

### **Evidence Base**

In the previous stage of this study (Stage B), the Project Team and Area Study Working Group developed a comprehensive Evidence Base for the South Central Radial Area.

This included a presentation and analysis of the socioeconomic context of the South Central Radial Area, its environment, and its transport networks.

It also explored projections for housing, population, and employment growth, and considered the implications for this growth on future demand for transport.

During this Stage, the Project Team worked closely with the Area Study Working Group and other stakeholders to understand the strengths, weaknesses, opportunities, and challenges facing the South Central Area.

The insights drawn from this exercise and the Evidence Base was used to create a shared **Vision and Objectives** for the South Central Area, which articulate the outcomes key stakeholders wish to see realised by 2050. This exercise also helped the Project Team develop a set of **Problem Statements** for the South Central Radial Area. These describe the challenges the area faces today that key stakeholders wish to see addressed.

The Vision and Objectives are important to this study as they formed the criteria against which all long listed interventions were qualitatively assessed in the Strategic Sift. Further detail about this process is provided in **Part 3** of this report.

The Problem Statements are also revisited in **Part 6**, where they are mapped to Packages to provide assurance they are being adequately addressed by this study.

The Vision and Objectives for the South Central Radial Area Study are presented on **page 23 to 25**. This is followed by a summary of the Problem Statements on **page 26**.

A full list of the Problem Statements is provided in **Appendix A.** 

## **Challenges and Opportunities**

The following 6 pages describes the key current and future challenges highlighted in the Evidence Base.

This includes the following challenges:

- current carbon emissions and trajectories;
- housing affordability;
- housing and employment growth;
- transport network resilience;
- rail connectivity; and
- the impact of COVID-19 on the area's economy.

This also includes the following opportunities:

- entrepreneurship hot spots; and
- the popularity of cycling in the area.



#### **Current Carbon Emissions**

#### In 2018, the South Central Radial Area's transport network emitted less carbon per capita than the South East overall.

3,746kTCO<sub>2</sub> were emitted by transport in 2018 in the South Central Radial Area, making up 45% of total carbon emissions. This is in line with other sub-regions in the South East. **Figure 3.1** provides a breakdown of transport carbon emissions per capita for each area of the South East.

35% of transport emissions are classed as minor road carbon emissions. This is higher than the South East average (28%), indicating lower coverage of major roads across the corridor, and different levels of transport demand along these roads.

### **Current Carbon Trajectory**

## As Figure 3.2 shows, reaching a net zero carbon transport network by 2050 (yet alone 2030) will be very challenging.

Carbon emissions from transport in the South East are declining, but not at a rate fast enough to reach net zero by 2050 or 2030.

At the time of writing in March 2021, 17 of the 20 local authorities (upper and lower tier) in the South Central Radial Area have declared Climate Emergencies and set targets to reach net-zero carbon emissions by 2050 (in some cases, much earlier).

#### Figure 3.1: Transport Carbon Emissions South East Area



Source: BEIS (2018)

#### Figure 3.2: Carbon Emissions Trajectory for the South East Area





## Housing Affordability

In 2019, the average home in the South Central Radial Area cost almost eleven times the average income in this area. This is the highest of the five sub-regions in the South East, where housing is 9.4 times as high as the average income.

**Figure 3.3** shows the affordability ratio for each area in the South East from 2002 to 2019. This ratio has been growing for all corridors in the past decade, indicating that housing is becoming more unaffordable.

In 2019, the least affordable housing in relation to earnings were in the areas closest to London, with the ratio in Mole Valley being in excess of 15:1, and Tandridge and Epsom and Ewell being in excess of 12:1. The ratio is also high in Brighton and Hove, in excess of 11:1.

In contrast, the most affordable housing is in Eastbourne, with a ratio of 8:1, however, prices here have still significantly increased over the past two decades.



#### Figure 3.3: Housing Affordability ratio over time in the South East Region



## Housing and Employment Growth

There is a risk that future development patterns will generate significant imbalance in housing and employment growth in the South Central Radial Area. Figure 3.4 below shows the housing and employment growth planned for this area. The area is expected to accommodate significant housing growth, particularly in the Horsham, Haywards Heath, and Burgess Hill areas. The pattern of development and the apparent imbalance of housing growth versus job growth (the latter is expected to be more concentrated on the Sussex Coast and in the Gatwick Diamond area) is likely to drive higher demand for highway capacity. This in turn is expected to place pressure on parts of the highway network that already experience regular congestion. There is a risk that many of the congestion, safety, and air quality issues highlighted in the previous page could worsen if not action is not taken to mitigate these impacts.

#### Figure 3.4: Housing allocations and employment growth forecasts in the South Central Radial Area





#### **Transport Network Resilience**

The South Central Radial Area is served by a key rail and highway "spine" – the Brighton Main Line, and the M23/A23.

In contrast to other parts of the South East, the South Central Radial Area is highly dependent on this single corridor. As **Figure 3.5** shows, the almost all radial rail routes and strategic highway routes merge at Crawley/Gatwick and continue north to London and the M25.

This means the area is vulnerable to significant disruption if there are any delays on this corridor.

The intensity of services on the Brighton Main Line means a small incident can have a significant impact on the wider network, especially if it occurs north of Gatwick. Similarly, disruption on the M23/A23 can force traffic on to the A22 and A24, which are not well suited to heavy traffic.



#### Figure 3.5: Radial routes in the South Central Radial Area



### Rail Connectivity

The Brighton Main line forms the railway spine of the South Central Radial Area. The level of service provided on the main line is generally very good, but connectivity is poorer for branch lines and other railways in the area.

The Brighton Main Line supports fast and local services between London with Gatwick Airport, Crawley, Haywards Heath and Brighton. Many services continue to Eastbourne and Worthing via the East and West Coastway lines. Supporting radial railway lines in this area include the Mole Valley and Arun Valley line, which connect Dorking, Horsham, Chichester and Littlehampton to London. The Ukcfield Branch of the Oxted line is unelectrified and the line is mostly single track south of Hever.

**Figure 3.6** presents the average speed of rail journeys along rail corridors in the South Central Radial Area and highlights the disparity in connectivity between the Brighton Main line and other railways. This disparity means some coastal communities need to "work harder" to secure investment and prosperity.



#### Figure 3.6: Rail connectivity in the South Central Radial Area

Source: ONS House Price Existing Dwellings to Residence Based Earnings Ratio (2019)



## COVID-19

The COVID-19 pandemic has significantly dented immediate prospects for the aviation industry, which is concentrated in the Gatwick Diamond.

**Figure 3.7** to the right shows the proportion of furloughed workers in the South Central Radial Area. Furlough rates were particularly high in the Crawley/Gatwick area, which is likely due to the high dependence of this area on the aviation industry, which has been particularly heavily impacted by the pandemic.

The post-pandemic economic impacts on the South Central Radial area remain to be seen. There may be an emergence of a new pattern of working which will need to be considered. To ensure established employment space is used effectively, good public and active transport connections from peripheral locations to city centres are required. This will ensure these cities enjoy economic prosperity and improved quality of life.



#### Figure 3.7: Radial routes in the South Central Radial Area



#### Entrepreneurship

The South Central Radial Area is home to one of the best cities in the UK for entrepreneurs and start ups.

In 2017 Brighton and Hove was identified as the 5<sup>th</sup> best place to start a small business in the UK, and in 2016 the same city was identified as the 4<sup>th</sup> best place for entrepreneurs (see **Figure 3.8**). London also scored highly in the latter study.

This is a significant strength for the South Central Radial Area and an opportunity for the wider South East. It shows a path to creating a more diverse, high value economy for the area.

Developing the right environment for new businesses requires a multitude of ingredients including skills, capital, land, and innovation. The area's universities and highly educated labour force, along with its strong connections to London, are likely to be contributing to Brighton's strong performance.

#### Figure 3.8: Top cities for entrepreneurs and start ups

#### The top five places to start a small business in the UK

Looking at a range of factors that can prove important for SMEs to succeed, including digital connectivity, property prices and business start-up figures, Informi has compiled a list of the best places to start your business.



## CAPITAL OF ENTREPRENEURS



Source: UCL School of Management (2016) <u>https://www.mgmt.ucl.ac.uk/capital-of-entrepreneurs</u> Informi.co.uk (2017) <u>https://informi.co.uk/blog/best-location-start-business-uk-might-surprise-you</u>



## Cycling

The South Central Radial Area is a popular area for leisure cycling. It is also the home a popular international cycleway, the Avenue Verte.

While relatively few commuting journeys are undertaken by bike (see Problem Statement 9 on **page 85** in the Appendix), leisure cycling is popular. The South Central Radial Area includes popular cycling attractions including Box Hill, Leith Hill, and Ditching (see **Figure 3.9**).

However, there are significant issues with safety and conflicts between cyclists and other road users at multiple locations in the area. Issues include infrastructure, lack of education/ road user training and enforcement

The popularity of cycling in this area should help make the case for investing in cycling infrastructure – including infrastructure that serves local journeys and supports shorter trips within the area.

#### Figure 3.9: Popular cycling attractions and routes in the South Central Radial Area



Source: Road Cycling UK <u>https://roadcyclinguk.com/sportive/ten-best-cycling-climbs-surrey.html</u> Cycling Weekly <u>https://www.cyclingweekly.com/news/latest-news/exciting-plans-new-cycling-hub-cafe-leith-hill-446080</u> Cycle Seahaven: <u>https://cycleseahaven.org.uk/review-of-the-avenue-verte/</u>

Surrey County Council (Surrey Cycle Routes): https://www.surreycc.gov.uk/\_\_\_data/assets/pdf\_file/0007/132001/Surrey-Cycleway-Map-updated-July-2019.pdf



TfSE's Transport Strategy for the South East sets out an ambitious vision for a sustainable, high performing, net-zero carbon transport system. We have applied this vision to the South Central Radial Area to develop a vision statement for this area.

#### **TfSE Vision Statement**

By 2050, the South East of England will be a leading global region for net-zero carbon, sustainable economic growth where integrated transport, digital and energy networks have delivered a step change in connectivity and environmental quality.

A high-quality, reliable, safe and accessible transport network will offer seamless doorto door journeys enabling our businesses to compete and trade more effectively in the global marketplace and giving our residents and visitors the highest quality of life.

## **South Central Vision Statement**

The South Central Radial Area will develop a sustainable, prosperous, balanced economy to provide opportunities for its residents, businesses, and visitors to thrive.

The area's economy will be more resilient to the economic shocks and will leverage the innovation and talents of the South Central Radial Area's people to develop successful businesses.

The transport networks supporting the South Central Radial Area will be reliable, resilient, well connected, and accessible. They will be aggressively de-carbonised to deliver a net-zero carbon economy by 2050.

The communities of the South Central Radial Area will be planned provide affordable housing for all and will be designed to promote sustainable travel outcomes.



## A high performing, multi-modal transport system will ensure this study helps deliver the following six objectives:

#### Economy

The South Central Radial Area's transport systems will boost prosperity for all and reduce the disparity in socioeconomic outcomes. It will do so in a sustainable manner, and not at "any cost" to society and the environment. It will achieve this by:

- Boosting productivity through better skills matching, knowledge sharing and agglomeration;
- Improving transport network efficiency, reliability, and resilience;
- Ensuring digital and energy networks can meet future transport needs;
- Reducing costs for businesses; and
- Attracting investment in high growth, high value opportunities.

#### Society

The South Central Radial Area's transport systems will enable better and more equitable socioeconomic outcomes:

- Supporting better place-making and creating new sustainable communities;
- Enabling residents to easily access employment, affordable housing and services – particularly for those who do not have access to a car;
- Increasing the affordability and availability of convenient, high quality, active travel and public transport options;
- Ensuring that interventions are suitable for all users including the elderly and individuals of reduced mobility and other additional needs; and
- Enabling deprived communities to attract investment and achieve more equitable socioeconomic outcomes.

#### **Natural and Historic Environment**

The South Central Radial Area's transport systems will protect and enhance the natural and historic environment by:

- Adopting the principles of environmental net gain;
- Avoiding interventions that significantly and permanently undermine protected environments, in particular landscape, historic and ecological designations;
- Reducing the impact of transport operations on ecosystem services; and
- Improving public and active transport access to natural, protected, and historic environments.



## A high performing, multi-modal transport system will ensure this study helps deliver the following six objectives:

## **Climate Change**

The South Central Radial Area's transport systems will move to net zero carbon and minimise disruption from climate change by:

- Reducing the need to travel;
- Enabling and growing active travel;
- Shifting passenger and freight travel from fossil fuel to non carbon emission energy;
- Improving transport network energy efficiency; and
- Improving transport network resilience to climate events such as flooding, high temperatures, drought and storm events.

#### **Reliability and Resilience**

The South Central's Radial Area's economy and transport systems will strengthen its resilience to external shocks by:

- Reducing the probability and impact of external shocks disrupting the area's transport networks;
- Building the right capacity and capability to respond effectively and quickly to external shocks;
- Enabling the area's transport systems to recover quickly from disruption;
- Consistently delivering high levels of reliability during normal periods of operation; and
- Enabling the economy to grow and diversify to enable the area to effectively respond to future economic shocks.

## **Sustainable Integrated Planning**

The South Central Radial Area will provide the affordable housing the area needs, but in a way that promotes sustainable travel outcomes by:

- Promoting development that reduces the need for residents to travel long distances to access employment, education, services, and transport hubs;
- Promoting development that encourages active travel and public transport over private car;
- Promoting development on and/or near to existing public transport corridors and hubs; and
- Enabling a balance of housing and employment growth to prevent significant imbalances within and between Major Economic Hubs.



## **Global Issues**

- 1. Transport is not de-carbonising fast enough
- 2. Climate change threatens the resilience of the transport network
- 3. Freight is heavily reliant on the highway network, especially for first-mile-last-mile deliveries
- There is a recognised need for housing and communities – but in the right places, supported by the right infrastructure, planned to deliver sustainable transport outcomes.

#### Economy

5. The area's economy is not growing as fast as other areas of the South East, and appears to be too reliant on a small number of industrial sectors.

#### Access

- 6. Rural communities are being left behind in digital, active travel, and public transport connectivity.
- 7. Too many transport services and networks are inaccessible to all users.

## **Active Travel**

- 8. There are significant gaps in regional, national, and international cycle networks in the area.
- 9. Active travel mode share is too low for many short journeys in the area.

#### **Public Transport**

- The Sussex Coastal conurbation the 2nd largest conurbation in the South East – does not have the mass transit systems it needs (and deserves).
- 11. There are gaps in the quality of interurban public transport provision, particularly in rural areas.
- 12. Public transport information and ticketing arrangements are not sufficiently coordinated nor adequately integrated, particularly across transport modes.
- 13. For many people, public transport fares are too high and too complicated.

#### Rail

- 14. Resilience is relatively poor on the Brighton Main Line – almost every passenger rail service passes through a single bottleneck at East Croydon
- 15. Spare capacity is limited on the Brighton Main Line and the allocation of this capacity does not meet the needs and/or aspirations of all the area's stakeholders
- Connectivity is relatively poor for communities served by the Arun Valley Line, East Coastway Line, and Oxted Line (especially when compared to the Brighton Main Line).

#### **Highways**

- 17. There are several congestion, road safety, and air quality "hot spots" in the area, particularly in Town Centres and at major junctions.
- 18. The area's major highways do not have enough capacity to accommodate planned housing (and potential airport) growth.

A detailed description of each Problem Statement is provided in Appendix A





## Part 4

Long List Generation and Assessment

## Overview of Stage C

One of the key purposes of this report is to summarise the activities that were undertaken to deliver Stage C of the South Central Radial Area Study.

Stage C comprised the following activities:

- Long List Generation
- Typology Assignment
- Long List Assessment
  - Strategic Assessment
  - Economic Assessment
  - Deliverability Assessment
- Package Development (Part 5)
- Package Modelling (Part 6)

In this Part of this report (**Part 4**) we describe how we approached and delivered the Long List Generation, Typology Assignment, and Long List Assessment activities listed above.

In **Part 5** we outline how the results of the Long List Assessment were used to develop Packages, and in **Part 6** we describe how these packages were modelled.

## Early Assessment and Sifting Tool

Our approach to delivering this Stage of the South Central Radial Area Study was developed in line with DfT's WebTAG guidance and Early Assessment and Sifting Tool (EAST).

WebTAG describe EAST as follows:

"EAST is designed to be consistent with Transport Business Case principles. It is a decision support tool that summarises and presents options in a clear and consistent format. It is used to assess and compare all types of transport options, packages, strategies and plans across all modes and geographies and is intended to provide decision makers with relevant, high level information to help them form an early view of how options perform against key criteria relative to each other."

While this is by nature a high-level approach, the Project Team is confident it represents the right level of proportionality for the nature (and number) of interventions under consideration.

## Multi Criteria Analytical Framework

A Multi-Criteria Analytical Framework (MCAF) spreadsheet was developed and used as an early assessment and sifting tool for this study.

The MCAF was based on the EAST and designed to help TfSE develop viable packages of interventions (groups of interventions based around a geographical area and/or transport mode), that could be tested through modelling for performance assessment.

The MCAF was used to sift out options that perform well on either a strategic, economic or deliverability assessment.

While only high-level information for each intervention is available at this early stage of option identification and assessment, the analysis formed a view on the performance of interventions based on best available data and evidence.

The MCAF tool developed for this study has also been fully quality assured and will be used to support the four other studies in the TfSE Area Studies Programme.



## Long List Generation

An initial Long List of interventions and options was developed from a wide range of sources.

Suggested interventions were drawn from input from the Project Team, desk research, interviews with Tier 1 stakeholders, and a workshop with Tier 2 stakeholders.

Interventions were only excluded from the Long List if they:

- did not primarily address movements relevant to the South Central Area;
- were not considered to be at sufficient scale to have regional significance (i.e., a specific, small-scale cycle intervention);
- were already under construction; and/or
- did not pass a basic 'common sense' feasibility test (i.e., if they were based on an unproven technology).

In total, 210 interventions and options were included in the Long List. These covered a wide range of topics including active travel, demand management infrastructure, highway improvements, rail interventions, port access infrastructure and policies.

## Typology Assignment

Given the long list of interventions and the evidence available, interventions and options were grouped into typologies.

This approach was adopted to provide a more efficient and transparent scoring and review process. The typology categories – which generally reflect modal and/or infrastructure categories are as follows:

- Active Travel
- Demand Management (Other)
- Demand Management (ULEZ)
- Enhanced bus services
- Freight
- Airport
- Port
- Highway infrastructure (online)
- Highway infrastructure (junctions)
- Integrated Public Transport
- New BRT
- New Highway
- New Railway
- Railway infrastructure
- Railway operations
- Smart Motorways
- Strategic Mobility Hubs

## Long List Assessment

With the long list complete, a qualitative assessment of the proposed interventions was undertaken.

A Multi-Criteria Assessment Framework (MCAF) was developed to provide a qualitative assessment of the strategic fit, economic viability, and deliverability of the interventions included in the Long List. The goal was to use the MCAF to sift out interventions that do not perform and to organise and compare options to help develop coherent Packages of interventions.

The MCAF included three discrete sifts:

- A **Strategic Assessment** that considered the alignment of each intervention with the Objectives of the study, as well as with wider public policy;
- An **Economic Assessment**, based on DfT's EAST framework; and
- A **Deliverability Assessment**, also based on DfT's EAST framework.

The following pages describe each assessment in more detail.



### Strategic Assessment Typology Scores

The Strategic Case Assessment tests the extent to which each intervention fits with this study's Vision and Objectives.

Government business case guidance sets out the need for strategic cases to demonstrate how spending proposals fit in relation to national, regional and local policies, strategies and plans.

Each typology was assigned scores ranging from 1 to 5, where 1 represents a low fit with this study's Objectives, and 5 shows a high fit. **Table 4.1** shows the results of this scoring for each typology.

The score in the strategic assessment forms the base score for each typology. These are later adjusted to reflect the situational context of each intervention (see following page).

The scores reflect a relatively wide range. For example, Smart Motorways do not perform as well under the Climate criteria as railway operations but do perform better than new highways.

#### Table 4.1: Typology Strategic Assessment

- · ·			Objec	tives		
Τγροίοgy	Climate	Resilient	Planning	Econ.	Soc.	Env.
Active Travel	4	2	4	3	3	3
Demand Management (Other)	3	2	4	3	3	3
Demand Management (ULEZ)	5	2	4	2	3	4
Enhanced bus services	3	2	4	3	3	3
Freight	1	3	2	4	2	3
Airport	1	3	1	4	2	1
Port	1	3	1	4	2	1
Highway infrastructure (online)	1	2	1	2	2	1
Highway infrastructure (junctions)	1	2	1	2	2	1
Integrated Public Transport	3	3	4	3	4	4
New BRT	3	2	3	3	3	2
New Highway	1	2	1	2	2	1
New Railway	3	2	3	3	3	1
Railway infrastructure	3	2	3	3	3	2
Railway operations	3	1	3	3	3	3
Smart Motorways	2	2	1	3	2	1
Strategic Mobility Hubs	3	3	3	3	2	2



#### Strategic Assessment Adjustments

In addition to assigning a 'base score' based on typologies, further modifications to some interventions' scores were also made to reflect their characteristics and context.

While many interventions share similarities (and typologies), there are some important differences between them. For example, a new highway in or close to protected areas should receive a lower score for 'Environment' than a new highway in a brownfield site.

To reflect these distances, the Project Team modified some scores by applying adjustment factors. These are listed in **Table 4.2** to the right. The 'Adjustment factors' have been developed to enable the typology assessment process to differentiate interventions from each other taking into consideration their impact upon the immediate surrounding environment. The adjustment factors either 'add' or 'remove' a point from the base score. This enables for an accurate representation of the intervention on the surrounding area.

#### Table 4.2: Strategic Assessment Adjustment Factors

Adjustments applied if the intervention	Objectives									
Delivers any of the impacts listed below	Climate	Resilient	Planning	Econ.	Soc.	Env.				
Permanently undermines protected areas						-1				
Temporarily undermines protected area						-1				
Enhances access to international gateways		+1		+1						
Reduces access to international gateways		-1		-1						
Enhances placemaking	+1		+1			+1				
Undermines placemaking			-1	-1	-1					
Supports housing development			+1	+1	+1					
Significantly enhances regional resilience		+1		+1	+1					
Reduces regional resilience		-1		-1	-1					
Delivers other climate change benefits	+1									

#### Worked Example

A 'generic' **Strategic Mobility Hub** intervention would initially be assigned the following:

Typology rategic Mobility Hubs (Typology Score)			Objec	tives		
туроюду	Climate	Resilient	Planning	Econ.	Soc.	Env.
Strategic Mobility Hubs (Typology Score)	3	3	3	3	2	2

However, if the Strategic Mobility Hub supports housing development, its score would be:

Typology		Objectives									
ιγροιοgy	Climate	Resilient	Planning	Econ.	Soc.	Env.					
Strategic Mobility Hubs (Adjusted Score)	3	3	4	4	3	2					



#### Alignment with Public Policy

A key component of the Strategic Assessment is to understand the extent to which each proposed intervention aligns with existing public policy.

Each intervention was assessed by the Project Team and members of the Outer Orbital Working Group for the alignment with national, local, and TfSE policy objectives.

Scoring was based on a scale of 1 to 5, with 5 representing high policy alignment and 1 representing low policy alignment. Lowest scoring interventions were typically those that contradicted policy objectives.

**Table 4.3**. to the right shows an excerpt of the results for the Solent Core Rail Package.

National policy alignment scores reflect policies, strategies, and interventions promoted by national government, National Highways, and Network Rail. They also reflect alignment with National Policy Statements. Where MPs were known to hold strong views on an intervention, then this was also reflected in the score. Local policy alignment scores reflect policies, strategies and interventions promoted by Local Transport Authorities, Local Planning Authorities, Local Enterprise Partnerships, national parks, and other protected landscapes. In some cases, there were differing views between these bodies. In these instances, we agreed an 'average' score to reflect these different perspectives. These scores were reviewed and agreed by these organisations (via the Working Group).

**Table 4.3:** Excerpt of Policy Alignment Scores

**Regional policy** alignment scoring was developed by TfSE Officials with support from the advisor team. They were informed by the vision, objectives, and priorities set out in the *"Transport Strategy for the South East"* document that was formally adopted by TfSE in autumn 2020.

In some cases there were significant differences between national, regional, and local policy alignment.

Intervention (Ontion	Policy Alignment						
Intervention / Option	National	Local	Regional				
Reinstate Cross Country services on Brighton Main Line	3	5	5				
New station to the north-east of Horsham	2	4	4				
Newhaven Port Rail Freight Access	4	4	5				
Arundel Chord -	2	3	4				



#### **Economic Assessment**

The Economic Assessment aims to identify the nature and scale of the economic, environmental, and social impacts of each typology and intervention.

Typically, an EAST Economic Assessment uses a three-point Red-Amber-Green (RAG) score system. This approach was adopted in line with DfT's EAST guidance and reflects the high-level nature of scheme level evidence available at this stage of the study.

To align the EAST scoring system with the scale adopted for the Strategic Assessment, the RAG scores are recorded as follows:

- **Red**: poor alignment = 1
- Amber: moderate alignment = 3
- Green: good alignment = 5

The RAG scores provide a clear visual guide to the potential impact of typologies and interventions as can be seen in the tables in the following pages.

#### **Economic Assessment Typology Scores**

As with the Strategic Assessment process, the Economic Assessment involved assigning scores to criteria based on the typology of each intervention.

These criteria are as follows:

- Economic Growth including connectivity, reliability, resilience of the network, facilitates the delivery of housing and provides good value for money in terms of social aspects.
- Carbon including number of carbon units lost, efficiency (fuel consumption reduction), and impact upon embedded carbon;
- Local Environment including impacts upon Air Quality, Noise, Natural Environment and Streetscape
- Wellbeing and Social Impacts including impacts upon severance, physical activity, injuries, access, security and affordability.

**Table 4.4.** (overleaf) summarises the resultsof this assessment.



## Table 4.4: Typology Economic Assessment

	Economic Growth				Carbon		Local Environment				Health and Wellbeing							
Typology	Connectivity	Reliability	Resilience	Housing	Value for Money	Activity	Efficiency	Embedded Carbon	Air quality	Noise	Natural env.	Street scape	Severance	Physical activity	Injuries	Access	SDIs	Security
Active Travel	3	3	3	3	5	5	5	5	5	5	5	5	5	5	3	5	5	3
Demand Management (Other)	3	3	3	1	3	3	3	3	3	3	5	5	3	5	5	3	3	1
Demand Management (ULEZ)	1	3	3	1	3	5	5	5	5	3	5	5	3	5	5	3	3	3
Enhanced bus services	5	5	3	3	5	3	3	3	3	3	3	3	5	5	3	5	5	3
Freight	5	3	3	1	3	5	3	3	3	3	3	3	3	1	5	3	3	1
Airport	3	3	3	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1
Port	3	3	3	1	3	5	3	3	3	3	3	3	3	1	1	1	1	1
Highway infrastructure (online)	3	5	3	3	5	1	3	3	3	1	3	3	3	1	3	1	1	1
Highway infrastructure (junctions)	3	5	3	3	5	1	3	3	3	1	3	3	3	3	3	3	3	3
Integrated Public Transport	5	3	5	3	5	5	5	5	5	3	5	5	5	5	3	5	5	5
New BRT	5	3	3	3	5	5	5	3	5	3	5	5	5	5	3	5	3	5
New Highway	3	5	5	5	5	1	3	1	3	3	1	3	3	3	3	3	3	3
New Railway	5	5	5	5	5	5	3	1	5	3	3	3	3	3	3	5	5	5
Railway infrastructure	3	3	3	3	5	3	3	1	3	3	3	3	3	3	3	3	5	3
Railway operations	3	3	3	3	5	5	5	3	3	3	3	3	3	3	3	3	3	3
Smart Motorways	5	3	3	3	3	3	3	3	3	3	3	3	3	1	3	3	3	3
Strategic Mobility Hubs	5	5	5	5	5	3	3	3	5	5	5	5	5	5	3	5	5	5



#### Economic Assessment Adjustments

As with the Strategic Assessment, some 'base scores' for some interventions were adjusted to reflect their context.

The same adjustment factors were used as within the strategic sift. However, in order to receive an adjustment, a more significant step-change was required in some places. For example: to receive an adjustment for 'enhancing access to an international gateway' the intervention needs to deliver 'step-change' in the quality of access provided. On the other hand, a new highway link that cuts through a national park would permanently undermine a protected area and receive a negative adjustment factor. A summary of the adjustment factors applied in the Economic Assessment is provided in **Table 4.5** below. As the 'base scores' jump from 1 to 3 to 5, the adjustments applied also increase and/or decrease by the same magnitude. This is why some adjustments presented below are either +2 or -2.

#### Figure 4.5: Economic Assessment Adjustment Factors

	Economic Growth					Carbon		Local Environment				Health and Wellbeing						
Typology	Connectivity	Reliability	Resilience	Housing	Value for Money	Activity	Efficiency	Embedded Carbon	Air quality	Noise	Natural env.	Street scape	Severance	Physical activity	Injuries	Access	SDIs	Security
Permanently undermines protected areas											-1							
Temporarily undermines protected area											-1							
Enhances access to international gateways	+1				+1													
Reduces access to international gateways	-1				-1													
Enhances placemaking												+1	+1	+1	+1	+1	+1	
Undermines placemaking												-1	-1	-1	-1	-1	-1	
Supports housing development				+2														
Significantly enhances regional resilience	+1	+1	+1															
Reduces regional resilience	-1	-1	-1															
Delivers other climate change benefits						+2	+2											



## Deliverability Typology Scores

The Deliverability Assessment aims to identify the key attributes that affects the likelihood of an intervention being developed, funded, and delivered.

The criteria used for this assessment is also based on DfT's EAST framework.

Evidence to inform this assessment was drawn from a variety of sources, including existing comparable schemes, national/ regional/local scheme information, Subject Matter Expert opinion, and publicly available information.

Most of the interventions and options included in the long list were at an early stage of development and therefore lacked detailed evidence such as cost estimates. To manage this evidence gap, the Project Team undertook a benchmarking exercise a compared proposed interventions to recently delivered 'similar' schemes. This exercise drew on the expertise of Project Team's Subject Matter Experts.

The Deliverability Assessment scores assigned to the typologies is provided in **Table 4.6** to the right.

#### Figure 4.6: Typology Deliverability Assessment

		Objectives										
Туроlоду	Capital Cost	Value for Money	Affordability	Timescale	Technical Risk	Acceptability	Evidence Base					
Active Travel	5	5	4	5	4	5	4					
Demand Management (Other)	4	4	4	5	4	4	4					
Demand Management (ULEZ)	4	5	4	3	3	2	4					
Enhanced bus services	4	3	4	3	4	4	4					
Freight	3	4	2	3	2	4	3					
Airport	3	3	2	3	2	3	3					
Port	3	3	2	3	3	3	3					
Highway infrastructure (online)	3	3	4	4	4	3	3					
Highway infrastructure (junctions)	3	3	4	5	4	3	3					
Integrated Public Transport	5	4	4	3	4	4	3					
New BRT	2	3	4	3	3	4	3					
New Highway	2	3	3	3	3	3	3					
New Railway	2	2	3	2	2	4	2					
Railway infrastructure	2	2	3	3	2	4	3					
Railway operations	3	4	4	4	4	5	3					
Smart Motorways	3	4	4	5	3	3	3					
Strategic Mobility Hubs	2	4	4	3	4	4	3					


## Approach to Deliverability Assessment

The scoring system required a different approach for each criteria, as the range of criteria is relatively diverse.

#### **Capital Costs**

Capital costs were based on infrastructure bands as follows:

- £0 20m = 5;
- £20m £50m = 4;
- £50m £250m = 3;
- £250m £1bn = 2;
- > £1bn = 1.

#### Value for Money

Value for Money assessments were broadly based on the scale of funding each intervention is expected to need. For example, Nationally Significant Infrastructure Projects were generally assigned lower scores than interventions requiring less public funding.

#### Affordability

Affordability was assessed against the likelihood that funding can be provided. It considered the attractiveness of project to delivery partners to provide funding, and whether there is a need for additional funds from non-government sources.

#### Timescales

Timescale bands covered short term (considered those that would be delivered within five years), medium term (delivered within five to fifteen years), and long-term (greater than fifteen years beyond the Local Plan end date) in line with Local Plan needs.

As such, these operate on a three-point score system of

- Long term = 1;
- Medium term = 3; and
- Short term = 5.

### **Technical Complexity**

Technical complexity was based on benchmarking against comparable schemes. 'Riskier' projects were assigned lower scores than less risky projects.

#### Acceptability

For the base typology scores, it was assumed that those interventions with smaller budgets are more likely to be developed, funded, and supported by both the general public and politicians than those of a much greater scale of impact.

#### **Evidence Base**

Finally, the Project Team reviewed the evidence base informing the development of each proposed intervention. Those interventions that can cite projects that have been successfully delivered in the UK were awarded higher scores than those supported by 'thinner' evidence bases.



## **Deliverability Adjustments**

A different set of criteria were also used to adjust Deliverability Typology Assessments base scores.

Adjustment factors for the deliverability case have been centered around 'high' versus 'low' assessment. They focussed on whether the typology would initially have a higher or lower adjustment (i.e., capital cost, affordability, timescale) than the basescore assigned. For example, a rail tunnel option would cost higher than a standard rail option.

A summary of the deliverability assessment adjustments is provided in **Table 4.7**.

Adjustments to the Acceptability criteria input score are closely linked with the policy alignment scoring derived in the Strategic Assessment. The base score for this criteria is aligned within how well it performs in policy alignment. It is then adjusted for whether it performs positively or negatively against support from stakeholders, the public and/or politicians.

#### Table 4.7: Deliverability Assessment Adjustments

Туроlоду				Objectives	;		
		Value for Money	Affordability	Timescale	Technical Risk	Acceptability	Evidence Base
Capital cost: High Cost	-1						
Capital cost: Low Cost	+1						
Expected Value for Money: High Value for Money		+1					
Expected Value for Money: Low Value for Money		-1					
Affordability: High affordability			+1				
Affordability: Low affordability			-1				
Timescale: Short Timescale				+1			
Timescale: Long Timescale				-1			
Technical complexity/Risk: High Complexity/Risk					-1		
Technical complexity/Risk: Low Complexity/Risk					+1		
Acceptability: High Acceptability						+1	
Acceptability: Low Acceptability						-1	
Evidence: Good Evidence							+1
Evidence: Low Evidence							-1



## **Technical Assurance**

The results of each Assessment were reviewed by Technical Experts, TfSE, and key stakeholders at multiple points.

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 and the Transport Appraisal Process. After assessment has been completed for each sift (strategic, economic, deliverability, the MCAF spreadsheet was audited and reviewed to ensure it was computing and recording results accurately.

The technical review also became an opportunity to discuss any issues in process or decision making and to justify and explain outcomes for interventions where there may have been debate. This information is entered into the MCAF comments log.

Following on from the internal technical assessment, the MCAF was then sent for review and moderation with stakeholders and TfSE.

## Stakeholder Moderation

All Assessment Results were reviewed by TfSE and shared with South Central Radial Area Study Working Group.

The Working Group did not propose any major changes to typologies or adjustments. Some members identified local issues that enabled the advisor team to 'boost' certain interventions. For example: it emerged that some highway interventions also included active travel elements and/or supported local housing developments, which enabled these interventions to be awarded higher scores for some criteria.

The Working Group proposed some changes to the Strategic Assessment scores – particularly with respect to policy alignment. This is to be expected, as the draft scores were based on published documents, whereas Working Group Members were able to provide insight on emerging policy.

A high-level summary of the results of the MCAF Economic and Delivery Assessments were also presented to the South Central Area Study Working Group. No significant changes were proposed at this stage.

## Park or Proceed Decision

Once the full outputs from the MCAF had been calculated, a final 'park' or 'proceed' manual assessment was undertaken.

In general, interventions were parked if they receive score of 3/5 or less for:

- **Policy alignment** (any score)
- **Strategic Sift** (average score)
- **Economic Sift** (average score)

Interventions with a **Delivery Sift** average score of 2/5 were also ruled out.

For interventions that had multiple options, where one option clearly outperformed the others, the best scoring intervention was set as 'proceed' and all others as 'park'.

Interventions that had multiple options with similar (high) scores were marked as 'proceed (consider all/remaining options)'.

At this stage, some interventions were transferred to other Area Studies or determined to be Global Policy interventions – interventions that will be assessed across the whole South East area.





Part 5 Package Development

## **Combined Approach to Package Development**

## A Top Down and Bottom Up View

TfSE has worked with key stakeholders and technical advisors to develop a set of coherent Packages that, together, are designed to deliver TfSE's vision and objectives for the South Central Radial Area.

These Packages have been developed through workshops, discussions, and careful analysis of results of the assessment of the long list of interventions described earlier.

The Packages combine an overarching vision for the South Central Radial area with the results of the Multi Criteria Analytical Framework.

In essence, this reflects both a 'top down' i.e., vision led approach and a 'bottom up' i.e., individual intervention assessment approach.

A diagram in **Figure 5.1** to the right illustrates the essence of this combined approach.

In this Part (**Part 5**), we present both the Vision and Long List Assessment results.

In the following Part (**Part 6**), we present the results of the modelling of the Packages in our land use and transport model.





Our vision for the South Central Radial Area is to develop a transport network that builds on earlier success, strengthens the area's transport networks' resilience, supports sustainable growth, and delivers for all modes. A breakdown of this vision is described in the diagram below.

#### Figure 5.2: Vision for the South Central Radial Area's transport system

#### South Central Radial Area today

The current South Central Radial area is characterised by one developed north – south corridor, which fans out into three corridors south of Crawley.

Crawley and Gatwick are served by an excellent Bus Rapid Transit system (Fastway).

There are gaps the resilience of all modes. In summary, any disruption on the principle rail and/or highway links north of Gatwick effectively "cut off" the Sussex Coast from London and the M25.



#### South Central Area Radial in 2050

Our vision for the South Central Area:

- builds on earlier success by expanding mass transit in Crawley and Brighton;
- strengthens resilience by improving railway, highway, and active travel north-south infrastructure;
- supports sustainable growth by providing capacity for housing in the Gatwick Diamond to grow; and
- delivers for all modes by including packages for every mode of transport.





## **Key Elements in the Vision**

To deliver the vision outlined in the previous page, the South Central Radial area will need to deliver improvements and changes to infrastructure, services, and policies across all transport modes. This will include delivering packages of rail, mass transit, active travel, and highways enhancements. The key elements of this vision are shown in **Figure 5.3**.

**Figure 5.3** to the right sets out the priorities for each key corridor

**Tables 5.1 – 5.9 in** the following pages describe the composition of the Packages that have been developed to deliver the vision for the South Central Radial area. They present the results of the MCAF assessment and list the interventions recommended for further appraisal.





## South Central Core Rail Package

The Core Rail Package addresses key bottlenecks on the Brighton Main Line. enabling faster, more reliable services.

A summary of the key interventions included in this package is provided in Table 5.1 to the right.

#### Package 1a: Core Rail Package

- Crovdon Area Re-modelling .
- Faster Brighton Main Line
- **Faster Arun Valley services** .
- Faster East Coastway services •
- **Keymer Junction/Wivelsfield** .
- **Brighton Station Platform**
- **Eliminate Joining and Splitting** •
- **Reinstate Cross Country** .
- North East Horsham Station .
- **Newhaven Port Freight Access**
- Electrification .
- London Terminal Capacity

#### Key to ticks



Works against objective (Scores less than 1.5)

#### Table 5.1: Core Rail Interventions and Options Assessment Results

had a second from	Outlan	Policy	Alignment	Scores	Average	e Assessmen	t Scores	Park or
Intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
Croydon Area Re-Modelling Scheme		<b>~</b> ~~~~	<b>~</b> ~~~	1111		<b>~</b>	<b>~</b>	Proceed
Faster Brighton Main Line		- 	~~~	<b>~~~~~</b>		<b>~ ~</b>	<ul> <li>✓</li> </ul>	Proceed
Keymer Junction/Wivelsfield		✓	<b>√√</b>	<b>√√</b>	<b>~ ~ ~</b>	<b>√√</b>	<b>√√</b>	Park
Brighton Additional Platform		<b>~ ~ ~</b>	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~~~~~</b>	< ✓ <	<b>√√</b>	Proceed
Eliminate splitting and joining		<b>~ ~ ~</b>	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~ ~ ~</b>	<b>~ ~ ~</b>	<b>~ ~ ~</b>	Proceed
24/7 Operations	Best performing options are those that support Gatwick and large towns	<b>~</b> ~~	<b>~ ~ ~</b>	<b>~ ~ ~</b>	<b>~ ~ ~ ~</b>	~~	<b>~ ~ ~ ~</b>	Proceed
Croydon – Canary Wharf Rail Link		×	<b>~</b> ~~~~	1111			×	For TfL
The mealing is Time at a big	Rationalise (reduce)		×		<b>~</b>			Park
Thameslink Timetable	Extend	✓		✓	<b>~</b>	<b>~ ~</b>		Park
Among Malland Inc.	Faster line speeds	✓	~~~	1111	<b>√√</b>	<b>~ ~</b>	<b>√√</b>	Park
Arun Valley Line	Fewer stops	<b>~ ~ ~</b>	~~~	<b>~~~~~</b>	<b>√√</b>	<b>~ ~</b>	<b>~ ~ ~ ~</b>	Proceed
	Faster line speeds	<b>√√</b>	<b>~ ~ ~</b>	<b>~</b> ~~~~	<b>√√</b>	<b>√√</b>	<b>~ ~ ~</b>	Proceed
Wivelsfield – Eastbourne/Seaford	Fewer stops	<b>~ ~ ~</b>	<b>~ ~ ~</b>	<b>~~~~~</b>	<b>√√</b>	<b>√√</b>	<b>~ ~ ~</b>	Proceed
Reinstate Cross Country services (interchange at Old Oak Common)	Brighton – Olympia	~~	<b>111</b>	<b>~</b> ~~~~	<b>~ ~</b>	<b>~ ~</b>	<b>~</b> ~~	Proceed
New station north-east of Horsham	Multiple options	<b>√√</b>	<b>~~~~~</b>	<b>~ ~ ~ ~</b>	<b>√√</b>	<b>~ ~</b>	<b>√√</b>	Proceed
Newhaven Port Rail Freight Access	Online enhancements	<b>~ ~ ~</b>	<b>~~~~~</b>	<b>~</b> ~~~~	<b>√√</b>	<b>√√</b>	<b>√√</b>	Proceed
Arundel Chord		✓	<b>√√</b>	<b>√√</b>	<b>√√</b>	<b>√√</b>	<b>√√</b>	Park
Hand Creater Half 11	Electrification	~~~	<b>111</b>	1111	<b>~ ~</b>	<b>~~~~~</b>	<b>~ ~</b>	Proceed
Hurst Green – Uckfield	Passing loops	<b>~~~~~</b>	1111	<b>V V V</b>	<b>~ ~</b>	~~~	<b>~ ~</b>	Proceed
Expand London terminal capacity	Victoria/London Bridge	444	1111	1111	<b>~~~~~</b>	<b>~</b>	<b>~</b>	Proceed





#### Railway Reinstatement Package

The South Central Radial area has a significant number of historic (i.e. dismantled) railways. The evidence examined by this study suggests the majority of these should remain closed.

As **Table 5.2** to the right shows, it appears that the rail corridors best placed for being brought back into use are the Uckfield – Lewes railway and the Tunbridge Wells West – Tunbridge Wells railway.

The East Grinstead – Crawley route also has a good case for being brought back into use. However, this corridor is perhaps better suited to being served by the nearby Fastway Bus Rapid Transit system.

Those corridors that are not considered to be appropriate for being reinstated as railways are nonetheless good candidates for being converted to active travel use.

#### Package 1b: Railway Reinstatements

- Reinstate Uckfield Lewes Tunbridge Wells
- Develop bus and active travel benefits on former rail routes

#### **Table 5.2**: Rail Reinstatement Interventions and Options Assessment Results

	Intervention	Ontion	Policy	Alignment	Scores	Average	Assessmer	t Scores	Park or
		Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
		Electrify	$\checkmark\checkmark$	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~</b>	~~~	<b>~ ~</b>	
	Uckfield – Lewes (Traction and capacity)	Electrify and passing loops	$\checkmark\checkmark$	<b>~</b> ~~~	<b>~</b> ~~~	$\checkmark \checkmark \checkmark$	<b>~~~~~</b>	<b>√√</b>	
		Electrify, double track, passing loops	$\checkmark\checkmark$	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>		<b>~ ~</b>	Proceed
	Uckfield – Lewes (Lewes	Lewes Loop	$\checkmark\checkmark$	<b>~</b> ~~~	<b>~</b> ~~~	<b>√√</b>	<b>~~~~~</b>	<b>√√</b>	(consider all options)
	configuration)	Avoid Lewes	$\checkmark\checkmark$	<b>~ ~</b>	<b>~ ~</b>	<b>~ ~</b>		<b>~ ~</b>	
	Eridge/Tunbridge Wells West – Tunbridge Wells	Reinstate railway and convert heritage railway	<b>~ ~</b>	~~~	<i>~~~</i>	<b>~ ~</b>	~~~	~~	
	Horsham – Worthing	Reinstate railway	×	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	<ul> <li>✓</li> </ul>	Park
5	Cuildford Horeborn	Reinstate whole railway	×	<b>~ ~</b>	<ul> <li>Image: A second s</li></ul>	<ul> <li>Image: A second s</li></ul>		<ul> <li>✓</li> </ul>	Park
	Guilafora – Horsham	Reinstate part (Guildford - Cranleigh)	$\checkmark\checkmark$	- <b>/ / /</b>	<b>~ ~</b>	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	<ul> <li>✓</li> </ul>	Park
	Friday Delegate	Reinstate railway	×	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	<ul> <li>✓</li> </ul>	Park
1	Eridge – Polegate	Reinstate part (Hailsham - Polegate)	$\checkmark\checkmark$	<b>~ ~</b>	<b>~ ~</b>	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	✓	Park
	E. Grinstead – Balcombe	Reinstate railway	×	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	<ul> <li>✓</li> </ul>	Park
	East Grinstead – Crawley	Reinstate railway	√√	<b>~</b> ~	<b>~</b> ~	<b>~</b> ~	<b>~ ~ ~</b>	~	Proceed (consider alongside BRT option)
	East Grinstead – Groombridge	Reinstate railway	<b>~ ~</b>	<b>~ ~</b>	<b>~ ~</b>	~	<b>~</b> ~~	×	Park
	Pulborough – Chichester	Reinstate railway	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓		✓	Park
	Midhurst – Petersfield	Reinstate railway	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	<b>~~~~~</b>	<ul> <li>✓</li> </ul>	Park
	Brighton – Devil's Dyke	Reinstate railway	✓	×	×	✓	<b>~ ~</b>	×	Park
	Altornativos	Bus / BRT	$\checkmark \checkmark \checkmark$	- <b>/ / /</b>		~~~	- <b>/ / /</b>	<b>~ ~</b>	Proceed
	Alternatives	Active Travel	$\checkmark \checkmark \checkmark$	- <b>/ / /</b>		~~	- <b>/ / /</b>	<b>~</b> ~~~~	Proceed



## Mass Transit Package

All mass transit options – shown in Table 5.3 to the right – perform well in the Multi Criteria Assessment Framework.

The Fastway Bus Rapid Transit systems in Crawley/Gatwick is recognised as a successful mass transit system. Its expansion on high growth corridors towards (and within) nearby Major Economic Hubs is endorsed by this study. This expansion would likely include investing in segregated bus infrastructure on the Crawley – Horsham, Crawley – East Grinstead, and Haywards Heath corridors.

Similarly, this study endorses plans that are currently being prepared by Local Transport Authorities to improve rural and interurban buses across the South Central Radial Area.

#### Package 2: Mass Transit

- Fastway expansion
- Rural and interurban bus service improvements
- Strategic Mobility Hubs at Three Bridges and North Brighton

#### Table 5.3: Mass Transit Interventions and Options Assessment Results

Intervention	Ontion	Policy	Alignment	Scores	Average	t Scores	Park or	
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
	Crawley – Horsham	~~~	1111	1111	<b>~~~~~~~~~~~~~</b>		<b>~~~~~</b>	
	Crawley – East Grinstead	~~~	1111	1111	<b>~~~~~~~~~~~~~</b>	<b>~~~~~</b>		-
	Crawley – East Grinstead – T. Wells	~~~	<b>~~~~~</b>	1111	<b>~~~~~~~~~~~~~</b>	<b>~~~~~</b>		-
Catwick Diamond BBT	East Grinstead – Tunbridge Wells	~~~	<b>~ ~</b>	1111	<b>~~~~~~~~~~~~~</b>	<b>~~~~~</b>		Proceed
(Fastway	Crawley – Haywards Heath	~~~	<b>~~~~~</b>	1111	<b>~ ~ ~ ~</b>	<b>~~~~~</b>	<b>~ ~ ~</b>	(consider all options)
enhancements)	Crawley – Haywards Heath – B. Hill	~~~	<b>~~~~~</b>	1111	<b>~ ~ ~ ~</b>	<b>~~~~~</b>	<b>~ ~ ~</b>	
	Haywards Heath – Burgess Hill	~~~	<b>√</b> √ √ √	1111	<b>~ ~ ~ ~</b>	<b>~~~~~</b>	<b>~ ~ ~</b>	
	Crawley – Guildford	<b>~</b> ~~~~	<b>√√</b>	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~~</b>	<b>~~~~~</b>	
	Crawley – Redhill	<b>~</b> ~~~~	~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~</b>	
	A22 Corridor	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>V V V</b>	<b>~~~~~</b>	<b>~~~~</b>	
	A23 Corridor	<b>~</b> ~~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~~</b>	<b>~~~~</b>	
	A24 Corridor	<b>~</b> ~~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~~</b>	<b>~~~~</b>	
	A26 Corridor (Lewes – Tonbridge)	<b>~</b> ~~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~</b>	<b>~~~~</b>	
Rural and interurban	A26 Corridor (Newhaven area)	<b>~</b> ~~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~</b>	<b>~~~~</b>	Proceed (consider all
	A272 Corridor	<b>~</b> ~~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~~</b>	<b>~~~~</b>	options)
	A264 Corridor	<b>~~~~~</b>	<b>~ ~ ~</b>	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~~~~~</b>	<b>~~~~</b>	
-	A29 Corridor	< √ √	<b>√√</b>	<b>√</b> √	<b>~~~~~</b>	<b>~~~~</b>	<b>~~~~</b>	
	A273 Corridor	< √ √	<b>√√</b>	<b>√</b> √	<b>~~~~~</b>	<b>~~~~</b>	<b>~~~~</b>	
	Three Bridges		~~~	~~~	<b>~~~~~</b>	1111	<b>~~~~~</b>	Proceed
Strategic Mobility Hubs	Patcham/North Brighton		111	1111	111	1111	111	Proceed





## **Active Travel**

## This study supports all active travel options in the Long List.

Each Local Transport Authority in the area is developing plans to improve urban cycling infrastructure, which is likely to generate significant benefits.

This study supports the continued development of regional cycleways, such as those in Surrey, and supports the reinstatement of a National Cycle Network between London and Brighton.

There is also an opportunity to develop a more direct Avenue Verte, which would serve international leisure trips.

#### **Policy Interventions**

Several policy and/or technology options, listed at the bottom of **Table 5.4**, are also supported by this study.

#### **Active Travel**

- Local and regional cycleways
- NCN Crawley Brighton
- NCN Crawley Chichester
- Avenue Verte

#### Table 5.4: Highways Interventions and Options Assessment Results (1 of 6)

Intervention	Intervention Ontion		Alignment	Scores	Average	Assessmer	t Scores	Park or
intervention	Орнон	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
Burgess Hill/Hayward	ds Heath Local Cycleways	n/a	<b>~</b> ~~~~	<b>~</b> ~~~~	<i>√√√√</i>	- <b>/ / /</b>	<b>~</b> ~~~~	Proceed
East Grinstead Local	Cycleways	n/a	~~~	<b>~</b> ~~~~	~~~		~~~	Proceed
Eastbourne/Hailshan	n Local Cycleways	n/a	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~</b> ~~~~~	<b>~~~~~</b>	<b>~</b> ~~~~	Proceed
Gatwick/Crawley Loc	al Cycleways	n/a	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~</b> ~~~~	Proceed
Horsham Local Cycle	ways	n/a	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~</b> ~~~~	Proceed
Lewes/Newhaven Lo	cal Cycleways	n/a	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	<b>~~~~~</b>	<b>~</b> ~~~~	Proceed
Reigate/Redhill Loca	l Cycleways	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~	<b>~~~~</b>	<b>~</b> ~~~	Proceed
East Sussex CC Regio	nal Cycleways	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~	<b>√√</b>	<b>~~~~</b>	Proceed
Kent CC Regional Cyc	<pre></pre> <pre>&lt;</pre>		<b>√</b> √ √ √	<b>√</b> √√√	<b>√</b> √ √ √	<b>√√</b>	<b>~~~~</b>	Proceed
Surrey CC Regional C	urrey CC Regional Cycleways		<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~~	<b>√√</b>	<b>~~~~</b>	Proceed
West Sussex CC Regi	onal Cycleways	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~	<b>√√</b>	<b>~~~~</b>	Proceed
London - Brighton N	CN Corridor	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~	<b>√√</b>	<b>~~~~</b>	Proceed
Crawley - Chichester	NCN Corridor	n/a	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~</b> ~~~	<b>√√</b>	<b>~~~~</b>	Proceed
	Realigned (faster) route	n/a	<b>~</b> ~~~	<b>~</b> ~~~~	<b>~</b> ~~~~	~~~	<b>~~~~</b>	Proceed
Avenue Verte	Tarmac and provide lighting	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~</b> ~~~	~~~	~~~	Proceed
Newhaven Port rail f	Newhaven Port rail freight interchange upgrades		~~~	<b>~</b> ~~~	<b>√√</b>	<b>√√</b>	<b>√√</b>	Proceed
Gatwick Diamond Freight Consolidation Centre		<b>~</b> ~~~	~~~	<b>~</b> ~~~	<b>√√</b>	<b>~ ~</b>	<b>~ ~</b>	Proceed
Improved Rural Demand Responsive Bus/Taxi Services		<b>√√</b>	<b>~~~~</b>	<b>~</b> ~~~~	<b>~~~~</b>	<b>√√</b>	<b>~~~~</b>	Proceed
Integrated and simpler fares, ticketing, marketing		<b>~</b> ~~~~	<b>\ \ \ \</b>	<b>~</b> ~~~	<b>~~~~~</b>	<b>~</b> ~~~		Proceed
A22 Smart Road Trial Proposition Study		< √ <	<b>\ \ \ \</b>	<b>~</b> ~~~	<b>~~~~~</b>	<b>~</b>		Proceed
A272/A283 AQMAs	Cowfold, Storrington, P'borough	n/a	~~	<b>~</b>	111		<b>~~~~~~~~~~~~~</b>	Proceed



## M23/A23 Highway Corridor

The M23/A23 highway provides excellent north – south connectivity between London and Brighton.

As shown in **Table 5.5** to the right, some improvements to junctions at the bottom end of this highway may be needed in the future to support significant housing development at Burgess Hill and Haywards Heath. Some investment may also be needed to improve access to Gatwick Airport if demand grows here.

This study has identified an opportunity to develop a new junction on the M23 for Redhill, which could be linked to the A23 and East Surrey Hospital by a new road running near to a nearby aerodrome. This would help relieve pressure on the A217 at Reigate Level Crossing, which would facilitate more rail services on the North Downs Line.

Package 4: Highways

- A23 Junction improvements
- M23 Gatwick Access
- M23 New Junction and Link Road south of Redhill

#### Table 5.5: Highways Interventions and Options Assessment Results (2 of 6)

Intervention	Ontion	Policy	Alignment	Scores	Average	e Assessmer	t Scores	Park or
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
	Smart Motorway	<b>~ ~</b>	<b>~ ~ ~</b>	✓	1	<b>~ ~</b>		Park
A23 Pease Pottage	Junction capacity enhancements	<b>~</b>	~~~	<b>√√</b>	<b>~ ~</b>	<b>~</b>		Proceed
Patcham	Online capacity enhancements	×	×	×	✓	<b>~ ~</b>	<b>~ ~</b>	Devil
	Offline capacity enhancements	×	×	×	✓	<b>√√</b>	<b>√√</b>	Park
M23 Junction 11 (Pease	Pottage) capacity enhancements	<b>√√</b>	<b>√√</b>	×	✓	<b>√√</b>	<b>√√</b>	Park
M23 Junction 10 (Crawle	ey) capacity enhancements	<b>√√</b>	<b>√√</b>	×	✓	<b>√√</b>	<b>√√</b>	Park
	Improvements to M23 Junction 9	<b>~ ~ ~</b>		<b>√√</b>	<b>√√</b>	<b>√√</b>	<b>√√</b>	Proceed
M23 Junction 9 (Gatwick Access)	Junction improvements to North and South terminal roundabouts	<b>~</b> ~~	<b>~ ~ ~</b>	<b>~ ~</b>	✓	<b>~</b> ~	<b>~ ~</b>	(consider all options)
A23 Gatwick – Crawley	Online junction improvements	✓	<b>√√</b>	×	<b>√√</b>	<b>√√</b>		Park
	New junction near aerodrome and link road to A23	<b>~</b> ~	<b>~ ~</b>	<b>~</b> ~~	<b>~ ~</b>	<b>~</b> ~	<b>~ ~</b>	Proceed (consider
M23 New Junction 8a (south of Redhill)	New junction at A25	✓	✓	✓	<b>√√</b>	<b>~ ~</b>	<b>√√</b>	options)
	Alternative northern relief road (Reigate)	×	×	×	✓	<b>~</b> ~	√√	Park
M23 Smart Motorway (J10 – 11)	Smart Motorway	~~	~~~	~~	~~	~~	<b>111</b>	Park
M23 Junction 8 (Hooley)	Online improvements	~~	✓	×	✓	~~	~~	Park
A273 Burgess Hill – Patcham	Online dualling	×	<b>~ ~</b>	✓	✓	<b>~ ~</b>	<b>~ ~</b>	Park



## A22 Highway Corridor

Improvements to the A22 are proposed at the top and bottom ends of this corridor.

**Table 5.6** to the right lists the interventionsthat have been considered for this corridor.

East Sussex County Council are developing a multi-modal highway intervention that will deliver improved highway and bus connectivity between Eastbourne and Hailsham. This intervention has good synergies with proposed improvements to the A27 between Lewes and Polegate, and unlocks an opportunity for a Strategic Mobility Hub to the west of Polegate.

While interventions are supported at the northern and southern ends of the A22, the rest of this highway A22 (other than the Uckfield Bypass) is probably not appropriate for significant future development.

#### Package 4: Highways

- A22 Godstone
- A22 Hailsham Uckfield
- A22 Polegate Hailsham
- A2270/A2101 MRN Scheme
- A22 Uckfield Bypass

#### Table 5.6: Highways Interventions and Options Assessment Results (3 of 6)

Intervention	Ontion	Policy	Alignment	Scores	Average	e Assessmer	nt Scores	Park or
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
A22 Polegate – Hailsham	Junction improvements	n/a	4444	<b>~ ~ ~</b>	~~	~~	<b>~ ~ ~</b>	Proceed
A22 Hailsham – Uckfield	Safety improvements	n/a	4444	~~	~~	~~	<b>~ ~ ~</b>	Proceed
A22 Uckfield Bypass	Online Dualling	n/a	<b>√√</b>	<b>~ ~</b>	<b>~ ~</b>	<b>~ ~</b>	<b>√√</b>	Proceed
	Online improvements	n/a	✓	<b>~ ~</b>	✓	<b>√√</b>	<b>√√</b>	Park
A22 Maresfield – East Grinstead	improved single carriageway	n/a	✓	×	✓	<b>√√</b>	<b>√√</b>	Park
Ghildedu	improved dual carriageway	n/a	×	×	✓	<b>√√</b>	<b>√√</b>	Park
	Northern route, single carriageway	n/a	×	×	✓	<b>√√</b>	<b>√√</b>	Park
A22 East Grinstead	Northern route, dual carriageway	n/a	×	×	✓	<b>~ ~</b>	~~	Park
Bypass	Southern route, single carriageway	n/a	×	×	✓	<b>~ ~</b>	~~	Park
	Southern route, dual carriageway	n/a	<b>√√</b>	×	✓	<b>~ ~</b>	~~	Park
	Offline single carriageway	n/a	<b>√√</b>	×	×	<b>~ ~</b>	~~	Park
A22 South Godstone – East Grinstead	Online dual carriageway	n/a	<b>√√</b>	×	✓	~~	~~	Park
	Offline dual carriageway	n/a	✓	×	✓	~~	~~	Park
	Online dualling	n/a	<b>~ ~ ~</b>	<b>~</b> ~~	<b>√√</b>	<b>~ ~</b>	<b>~ ~ ~</b>	Proceed
A22 Godstone Bypass	Grade separated junctions	n/a	✓	×	<b>~ ~</b>	~~	~~	Park
A2270/A2101 Corridor	MRN Scheme	n/a	<b>~</b> ~~~	<b>~</b> ~~~	<b>~ ~</b>	~~	~~	Dueseed
Movement and Access Package (MRN scheme)	As above including Cophall Roundabout	n/a	<i><b>√</b>√√√</i>	<i><b>√</b> √ √ √</i>	<b>~ ~</b>	<b>~ ~</b>	~~	(consider all options)
M25 Junction 6	Capacity enhancements	n/a	~~	~~	<b>~ ~</b>	~~	~~	Inner Orbital Study



## A24 Highway Corridor

Targeted improvements at the northern end of the A24 will help strengthen the resilience of north – south highways in the South Central Radial Area

**Table 5.7** to the right lists the interventions that have been considered for this corridor.

Surrey County Council and West Sussex Council are working together to develop a set of packages aimed at delivering better connectivity (and safer junctions) on the A24 between Horsham and the M25.

This initiative is fully supported by this study as it would effectively deliver a highquality alternative to the A23 and M23 highway corridor.

Improvements for other parts of this corridor, particularly where it runs through the South Downs National Park, are not recommended by this study.

#### Table 5.7: Highways Interventions and Options Assessment Results (4 of 6)

Intervention	Ontion	Policy	Alignment	Scores	Average	e Assessmer	nt Scores	Park or
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
A280 Clapham –	Online dualling	n/a	×	×	1	<b>√√</b>	<b>~ ~</b>	Deule
Findon	Clapham Bypass	n/a	×	×	✓	<b>√</b> √	<b>~ ~</b>	Рагк
A24 Finder Hereberg	Online improvements	n/a		<b>~</b>	<ul><li>✓</li></ul>	<b>√√</b>	~~~	Deul
A24 FINGON – HOISHam	Grade separation	n/a	<b>~ ~</b>	×	1	~~	~~	Park
	Offline single carriageway highway	n/a		<b>~</b>	<b>~ ~</b>	<b>~ ~</b>	<b>~ ~</b>	
A24 Capel – Horsham	Offline dual carriageway highway	n/a		<b>~ ~</b>	<b>~ ~</b>	<b>√</b> √	<b>~ ~</b>	Proceed (consider all
	Offline dual carriageway highway and flyover at Clark's Green	n/a	<b>~</b> ~~	×	<b>~ ~</b>	<b>~ ~</b>	~~	options
	Online improvements	n/a		<b>~ ~</b>	✓	<b>√</b> √	~~~	Proceed
A24 Dorking – Capei	Grade separation	n/a	<b>~</b>	×	✓	<b>√√</b>	<b>~ ~</b>	(consider all options
	Online dualling	n/a		<b>~ ~</b>	<b>~ ~</b>	<b>√√</b>	~~~	Proceed
A24 Dorking Bypass	Online dualling and grade separation at junctions	n/a	<b>~ ~</b>	×	✓	<b>~ ~</b>	<b>~ ~</b>	(consider all options
	Online dualling	n/a	<b>~~~~~</b>	<b>~ ~</b>	<b>√√</b>	<b>~ ~</b>	<b>~ ~ ~ ~</b>	Procood
A24 Leatherhead Bypass	Online dualling and grade separation at junctions	n/a	~~	×	1	~~	~~	(consider all options
A29 Enhancements	Online improvements Billingshurst – Pulborough	n/a	✓	<b>~ ~</b>	×	<b>~ ~</b>	<b>~ ~</b>	Park

#### Package 4: Highways

• A24 Leatherhead – Horsham



## A26 Highway Corridor

No significant improvements are recommended for the A26 corridor – the focus here should be on delivering a new passenger rail service and better bus services on this route.

The A26 passes through the Weald and Ashdown Forest protected areas, and is therefore unsuitable for significant development.

That said, there appears to be a case for improving the A26 between Lewes and the Port of Newhaven. This route currently has tight alignments in places and presents some safety challenges.

**Table 5.8** to the right lists the complete set of options considered for this corridor.

Intervention	Ontion	Policy	Alignment	Scores	Average	e Assessmer	nt Scores	Park or
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
	Online improvements	<b>√√</b>	<b>√√</b>	<b>~~~~~</b>	<b>√√</b>	<b>√√</b>	<b>~ ~</b>	Proceed
A26 Lewes –	Offline single carriageway	✓	<ul> <li>✓</li> </ul>	<b>√√</b>	×	<b>√√</b>	<b>√√</b>	
Newhaven	Online dual carriageway	< √ √	✓	< √ √	✓	< ✓ <	<b>√√</b>	Park
	Offline dual carriageway	< √ √	✓	✓	✓	< √ √	<b>√ √</b>	
A26 Lewes – Uckfield	Online dualling	n/a	<b>√√</b>	×	✓	< √ √		Park
A26 Uckfield – Crowborough	Alignment and junction improvements	n/a	×	×	✓	<b>~ ~</b>	< ✓	Park
	Eastern route, single carriageway	n/a	×	×	✓	< √ √	<b>√√</b>	
A26 Crowborough	Eastern route, dual carriageway	n/a	×	×	✓	< √ √	<b>√√</b>	
Bypass	Western route, single carriageway	n/a	×	×	✓	< √ √	<b>√ √</b>	Park
	Western route, dual carriageway	n/a	×	×	✓	< √ √	<b>√ √</b>	
A26 Crowborough - Tunbridge Wells	Alignment and junction improvements	n/a	×	×	✓	<b>~ ~</b>	~~	Park
A26 Tunbridge Wells	Offline single carriageway	n/a	×	×	✓	<b>√√</b>	<b>~</b>	
Southern Bypass	Offline dual carriageway	n/a	×	×	✓	<b>~</b>	~~	Park

#### Table 5.8: Highways Interventions and Options Assessment Results (5 of 6)

#### **Package 4: Highways**

A26 Lewes – Newhaven



### East – West Highways

Surrey County Council are developing a new link road to the west of Crawley to support the urban expansion of this Major Economic Hub.

This highway could include a dedicated bus lane, which could support expanded Fastway Bus Rapid Transit Services.

Further improvements to east west highways will be needed in some places to support housing growth, particularly in the Gatwick Diamond area.

Several other highways interventions listed in **Table 5.9** to the right are not expected to be taken forward.

#### Package 4: Highways

- A264 Horsham Crawley
- Crawley Western Link Road

able 5.9: Highway	s Interventions and O	ptions Assessment Results (	6 of 6)
			/

Intervention	Ontion	Policy	Alignment	Scores	Average	Assessmen	t Scores	Park or
intervention	Option	National	Local	Regional	Strategic	Economic	Delivery	Proceed?
A264 Horsham –	Online improvements	n/a	~~~	$\checkmark\checkmark$	<b>~ ~</b>	<b>~ ~</b>	<b>~ ~ ~</b>	Proceed
Crawley (Pease Pottage)	Grade separation	n/a	✓	×	✓	<b>~</b>	<b>~</b>	Park
	Offline single carriageway	n/a	✓	×	✓	<b>~ ~</b>	<b>√√</b>	
A264 Crawley – East	Online dual carriageway	n/a	✓	×	<b>~ ~</b>	<b>~ ~</b>	<b>√√</b>	Death
Grinstead	Offline dual carriageway	n/a	✓	×	✓	<b>~ ~</b>	√√	Рагк
	Link road to A22	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>✓</li> </ul>	~~	<b>√√</b>	
A264 East Grinstead –	Offline single carriageway	n/a	<ul> <li>✓</li> </ul>	×	×	~~	<b>√√</b>	Deals
Royal Tunbridge Wells	Online/offline dual carriageway	n/a	✓	×	×	<b>~ ~</b>	<b>~ ~</b>	Рагк
A272 Crawley Western	Offline dual carriageway	n/a	- <b>/ / /</b>	~~	<ul> <li>✓</li> </ul>	~~	<b>√√</b>	Park
Link Road	As above with bus lane	n/a	<b>V V V</b>	- <b>/ / /</b>	<b>~ ~</b>	~~	<b>~ ~</b>	Proceed
)	East – West	n/a	✓	×	<ul> <li>✓</li> </ul>	<b>~ ~</b>	<b>~ ~</b>	Park
A272 Cowfold Bypass	East - West and North – South	n/a	✓	×	<ul> <li>✓</li> </ul>	<b>~ ~</b>	<b>~ ~</b>	Park
	Single carriageway	n/a	✓	×	<ul> <li>✓</li> </ul>	<b>~ ~</b>	<b>~ ~</b>	Death
A272 Ansty Bypass	Dual carriageway	n/a	✓	×	<ul> <li>✓</li> </ul>	<b>~ ~</b>	<b>~ ~</b>	Рагк
A272 Tyler's Green	Single carriageway	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>✓</li> </ul>	~~	<b>~ ~</b>	Devile
Bypass	Dual carriageway	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>✓</li> </ul>	~~	<b>~ ~</b>	Park
A272 Bolney –	Dualling	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>✓</li> </ul>	~~	<b>~ ~</b>	Devile
Haywards Heath	Dualling and grade separation	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>Image: A second s</li></ul>	~~	<b>~</b>	Park
A272 Haywards Heath	Improved single carriageway route	n/a	<ul> <li>✓</li> </ul>	×	<ul> <li>Image: A second s</li></ul>	~~	<b>~</b>	Death
– Maresfield	Improved dual carriageway route	n/a	~~	~~	<ul> <li>✓</li> </ul>	~~	<b>~</b>	Park
A281 G'ford – Horsham	Alignment/junction improvements	n/a	×	<ul> <li>✓</li> </ul>	- <b>/ / /</b>	×	<b>√√</b>	Park





## Part 6 Package Modelling

## **Introduction to SEELUM (1 of 3)**

## Introducing SEELUM

In 2018, Transport for the South East commissioned Steer to develop a model to test the impact of the scenarios developed in support of the development of a Transport Strategy for the South East.

This model, known as the South East Economy and Land Use Model (SEELUM), is a transport and land use model that simulates the interaction of transport, people, employers and landuse over periods of time.

A high-level view of SEELUM is provided in **Figure 6.1** to the right.

Due to the geographical scope and intermodal nature of the Area Studies, the Project Team has agreed that SEELUM should be used to model the impacts of the Packages developed for this study on transport and socioeconomic outcomes over a 30-year period.

A map showing the zones included in the SEELUM model is provided in Figure 6.2 overleaf.

#### Figure 6.1: SEELUM



#### SEELUM produces detailed reports on:

- changes in land-use in each zone (i.e., housing units and employment premises);
- changes in households, population and the workforce in each zone;
- changes in employment (jobs filled) in each zone and the unemployment rates;
- changes on CO<sub>2</sub> emissions from transport activity;
- travel patterns, volumes and mode shares; and
- time savings benefits for appraisal and impacts on productivity and agglomeration.



## **Introduction to SEELUM (2 of 3)**

#### Figure 6.2: SEELUM Zones







## SEELUM's Capabilities and Functions

SEELUM tests how investment in transport, coupled with changes to land-use policy, affects transport outcomes and the economic performance of the South East.

It does this by simulating how changes in patterns of connectivity and access affect how attractive different locations are for employers and/or households to locate in. how they respond to these changes, and what transport patterns arise from these changes. For example, if travel costs rise in a particular area (say, due to highway congestion), depending on the other options available, people may change their mode of travel, change where they live, or change where they work. In the extreme, if there are no other viable options to access work, people can become unemployed. Similarly, businesses can relocate to an area if transport costs reduce, increasing their accessibility to the workforce.

**SEELUM simulates how land use evolves over time.** It considers how developers provide new housing, the inward and outward migration of households, and the start-up and closure of businesses. SEELUM includes (relatively high-level) internal network models of highways and rail networks. These are used to model the impacts of congestion and crowding on journey times. These connect places together and influence their relative advantages as places to live or work.

SEELUM also models the carbon emissions of the highway and railway networks. This is based on the Defra's Emissions Factors Toolkit (provided by DfT). Highway emissions are calculated as a function of the vehicle kilometres (km) and an emissions rate per km based on road type. Average emission rates, differing by road type (rural, urban and motorway) are calculated using vehicle emissions rates and fleet mix assumptions derived from the Emissions Factor Toolkit These assumptions are applied to vehicle kilometres travelled per road type, as calculated by the model to forecast highway emissions. Railway emissions are calculated by a function of kilometres travelled, vehicles in service, the consumption rate per vehicle km, and the greenhouse gas emissions per unit of fuel used.

## Modelling Packages in SEELUM

To model each Package in SEELUM, adjustments were made to:

- Generalised Journey Times (GJTs) within and between each zone (by mode); and
- Characteristics of links on the highway and railway network (notably capacity).

For example, to model an improvement in bus frequencies between Chichester and Bognor Regis, GJTs were reduced for bus between each town's respective SEELUM zone. To model an improvement to the Chichester Bypass, the capacity of the highway link in SEELUM that models this part of the highway network was increased.

The Packages were modelled in SEELUM from a base year of 2018 and run for 32 years to 2050. The results are presented as a comparison to a Business as Usual Scenario (BaU), which is based on the Department for Transport's National Trip End Model (NTEM) that also projects employment and population growth to 2050.

The following pages describe the results of this modelling exercise.



## 1a: Core Rail Package

This Package delivers a higher capacity, more resilient, and faster passenger rail service on the Brighton Main Line, Arun Valley Line, and East Coastway Line. The initiatives included in this package, and our approach to modelling their effects, are summarised in **Table 6.1** to the right.

#### 1b: Railway Reinstatements

This Package reopens two former railways in East Sussex, providing a new rail link from Croydon and Royal Tunbridge Wells to Lewes and Brighton.

When this Package is implemented, it is assumed that:

- one train per hour would operate between London, Uckfield, Lewes, and Brighton; and
- one train per hour would operate from London to Sevenoaks, Tunbridge, Royal Tunbridge Wells, Uckfield, Lewes, and Brighton.

The GJT adjustments assumed for this Package are provided in **Table 6.2** overleaf.

#### Table 6.1: SEELUM Modelling Adjustments (Package 1)

Interventions	Impact and Benefits	Modelling Adjustments				
Brighton Main Line capacity and speed enhancements	This includes the Croydon Area Remodelling Scheme, which increases track capacity by 60%, and some incremental speed enhancements to progress the railway closer to 100mph operation.	<ul> <li>These interventions have been modelled by:</li> <li>Reduces Generalised Journey Times (GJTs) on the Brighton Mainline by 10%.</li> <li>Increases capacity by 50% on rail links between Croydon and Three Bridges.</li> </ul>				
Arun Valley and East Coastway speed enhancements	These interventions would eliminate the need for splitting and joining trains at any point on the Brighton Main Line, which would reduce GJTs on Arun Valley and East Coastway services by around 10 minutes.	<ul> <li>These interventions have been modelled by:</li> <li>Reduces GJTs by 10 minutes between zones served by Arun Valley (Bognor Regis/ Chichester) and East Coastway services (Newhaven/Eastbourne).</li> </ul>				
Reinstated Cross Country services	This intervention reintroduces a Cross Country service between Brighton and the West Coast Mainline. This would likely only be possible post HS2 (Phase 1), but would enable better connectivity to North/West London and the Midlands. Currently, there is a service from Milton Keynes to East Croydon, which is 20 minutes faster than alternative services via Central London. This can be used as a proxy for GJT savings for this intervention.	<ul> <li>This intervention has been modelled by:</li> <li>Reduces GJTs by 20 minutes between Brighton, Mid Sussex, Crawley, Reigate/Banstead, Croydon and West London, the East of England, Milton Keynes, the West Midlands, the North West of England, and Scotland.</li> </ul>				
Re-establishment of the Uckfield to Lewes railway	This would enable direct (and therefore much faster) rail services between Tandridge, Wealden and Lewes. It is hard to determine the new GJTs for these journeys, but based on current very high GJTs (3 hours+), we expect the impact to be transformational for these journeys. This intervention would also increase service frequencies between Crowborough and Uckfield from 1 train per hour (tph) to 2tph. We anticipate this would relieve some pressure on the Brighton Mainline too.					
Re-connection of the Tunbridge Wells West and Royal Tunbridge Wells railway	This intervention would enable services currently terminating at Royal Tunbridge Wells to continue to Brighton. This would also transform journey times between Tunbridge and the areas listed above. It would also increase service frequencies between Lewes and Brighton from 3tph to 4tph					



The Uckfield – Lewes and Eridge – Tunbridge Wells railways are not currently in passenger use and are not included in SEELUM. To model the benefits that might arise from reinstating this railway, we have estimated the journey times that would be delivered by the new railway and compared these to existing journey times. The existing journey times were taken from public timetables and are based on current services during a mid afternoon in mid-July 2021.

We have assumed an Uckfield – Lewes railway would deliver a journey time of Uckfield to/from Lewes in 15 minutes. We will also assume a journey time of Crowborough – Royal Tunbridge Wells of 20 minutes.

We will assume one train per hour will operate to the schedule below:

Brighton >> 16 mins >> Lewes >> 15 mins >> Uckfield >> 11 mins >> Crowborough >> 20 mins >> Royal Tunbridge Wells >> 9 mins >> Tonbridge >> 8 mins >> Sevenoaks

With a change at Tonbridge, we estimate the follow journeys would also be achievable (an interchange penalty based on the existing timetable is included):

Royal Tunbridge Wells >> 40 mins >> Maidstone West >> 23 mins >> Strood

This yields journey time reductions set out in Table 6.2 below.

#### Table 6.2: SEELUM Modelling Adjustments (Package 1)

From	To Lewes	To Uckfield	To Crowborough	To T. Wells	To Tonbridge	To Maidstone	To Strood	To Sevenoaks	To Ashford
Brighton	0%	75%	65%	55%	35%	20%	5%	25%	5%
Lewes		90%	80%	55%	55%	40%	25%	50%	0%
Eastbourne	0%	75%	70%	15%	40%	20%	0%	15%	0%
Worthing	0%	50%	35%	35%	20%	15%	0%	10%	5%
Chichester	0%	35%	30%	15%	5%	0%	0%	0%	0%
Uckfield	35%		0%	70%	60%	55%	35%	50%	30%
Crowborough		0%		80%	65%	60%	40%	60%	35%
Portsmouth	0%	30%	20%	10%	0%	0%	0%	0%	0%
Southampton	0%	20%	5%	0%	0%	0%	0%	0%	0%
Three Bridges	0%	40%	15%	10%	0%	0%	0%	0%	0%
Hastings	0%	50%	50%	0%	0%	0%	0%	0%	0%
Newhaven	0%	75%	65%	40%	40%	35%	20%	40%	0%
Burgess Hill	0%	40%	20%	10%	0%	0%	0%	0%	0%
Horsham	0%	25%	5%	0%	0%	0%	0%	0%	0%



## 2: Mass Transit

This Package envisages the Crawley Fastway BRT system would expand and enhance its service offer. It also allows for a modest improvement in other interurban and rural services.

The initiatives included in this package, and our approach to modelling their effects, are summarised in **Table 6.3** to the right.

#### 3: Active Travel

This Package assumes there would be a general uplift in the quality of walking and cycling infrastructure, particularly in the Gatwick Diamond area. The initiatives included in this package are also shown to in the table to the right.

#### Table 6.3: SEELUM Modelling Adjustments (Packages 2 and 3)

Interventions		Impact and Benefits	Modelling Adjustments		
Package 2	The Crawley Fastway service expands to include all of the Built Up Areas in the centre of the area – including Reigate/Redhill, Gatwick Diamond, Horsham, and Burgess Hill/Haywards Heath. The assumed reduction in GJTs mirrors those derived for the Outer Orbital Area Study. As some areas already benefit from BRT services, the incremental change will be less pronounced within and in-between some zones compared to others.		<ul> <li>These interventions have been modelled by:</li> <li>Reducing bus GJTs by 20% between and within all zones in the South Central Radial area, including bordering zones such as London not captured in th Outer Orbital Area Study or South East Radial Area Study.</li> <li>Earlier iterations of this approach to modelling considered higher GJT reductions in urban areas ar lower reductions elsewhere. Given the large size o zones, and variable current hus service a flat 20%</li> </ul>		
	Interurban and rural bus services	This intervention assumes all other conventional bus services in the South Central Radial area experience general improvements in journey times, frequencies, and service quality. The assumed reduction in GJTs mirrors those derived for the Outer Orbital Area Study.	reduction covering the Gatwick Diamond area has been suggested instead. This represents quality, reliability, speed, and frequency improvements. In reality, there would likely be transformational improvements on some corridors and more incremental changes elsewhere.		
Package 3	Bike sharing schemes	Bike Sharing interventions reduce generalised journey times of active travel and public transport – one study suggests savings of <u>10%</u> <u>per trip</u> are achievable. We have assumed that bike sharing schemes will eventually be available in all built up areas (thanks to emerging new mobility services).	<ul> <li>These interventions have been modelled by:</li> <li>Reducing active travel GJTs by 10% between and within zones served by bike share schemes (Crawley, Reigate/Banstead, Epsom/Ewell, and Burgess Hill/Haywards Heath).</li> <li>Eastbourne, Lewes and Hastings/Bexhill are modelled in the Outer Orbital Area Study.</li> </ul>		
	Cycling infrastructure	A study on the effect of London's Cycle Superhighways found that journey times by bike were reduced by <u>11%</u> . We have assumed that every zone in the Built Up Areas will benefit from this type of cycling infrastructure. Additionally, we are including improved infrastructure for the NCN and Avenue Verte south of Gatwick.	<ul> <li>These interventions have been modelled by:</li> <li>Reducing active travel GJTs by 10% within Built U Areas in the Gatwick Diamond.</li> <li>Reducing active travel GJTs by 10% between: <ul> <li>Crawley, Horsham and Chichester (new NCN)</li> <li>Crawley, Mid Sussex, and Brighton and Hove (improved NCN)</li> <li>Tandridge, Mid Sussex, and Lewes (Avenue Verte)</li> </ul> </li> </ul>		



## 4: Highways

This Package targets a limited number of highway improvements on the A22, A24, and A26 corridors to strengthen northsouth highway resilience. They also include targeted local improvements aimed at supporting housing growth in areas such as Burgess Hill, Crawley, Haywards Heath, and Horsham.

The initiatives included in this package, and our approach to modelling their effects, are summarised in **Table 6.4** to the right.

It was not possible to model all interventions in SEELUM (due to their geographic scale).

#### Table 6.4: SEELUM Modelling Adjustments (Package 4)

Interventions	Impact and Benefits	Modelling Adjustments
A24 capacity enhancements	This would upgrade the current road from a UAP1 Single (9.00m) highway to a UAP1 Dual (7.30m) highway, representing a 94% increase in capacity. This would apply to 50% of the relevant SEELUM highway link, yielding an overall increase of 47%.	<ul> <li>This intervention has been modelled by:</li> <li>Increasing capacity by 47% between M25 Junction 8 (Leatherhead) and Horsham</li> </ul>
A22 Godstone area	This would upgrade the current road from a UAP1 Single (9.00m) highway to a UAP1 Dual (7.30m) highway, representing a 94% increase in capacity. This would apply to 25% of the relevant SEELUM highway link, yielding an overall increase of 23%.	<ul> <li>This intervention has been modelled by:</li> <li>Increasing capacity by 23% between M25 Junction 6 and East Grinstead.</li> </ul>
A22 Uckfield Bypass	This would upgrade the current road from a UAP1 Single (9.00m) highway to a UAP1 Dual (7.30m) highway, representing a 94% increase in capacity. This would apply to 100% of the relevant SEELUM highway link, yielding an overall increase of 94%.	<ul> <li>This intervention has been modelled by:</li> <li>Increasing capacity by 94% on the Uckfield Bypass.</li> </ul>
Crawley Eastern Link Road and A264	This would upgrade add a UAP1 Single (9.00m) highway to an existing UAP1 Dual (7.30m) highway, representing a 52% increase in capacity. This would apply to 50% of the relevant SEELUM highway link, yielding an overall increase of 26%.	<ul> <li>This intervention has been modelled by:</li> <li>Increasing capacity by 26% between Crawley and Horsham.</li> </ul>
M23 Junction at Redhill and minor junction enhancements planned for the A23 and A24	While these interventions are supported in this study, they cannot be modelled in SEELUM due to their geographic scale.	Not modelled
A26 Lewes – Newhaven	While the Area Study will likely support a partial realignment on this road, as it is not included in the SEELUM model, we cannot model this intervention.	Not modelled



A summary of the transport and socioeconomic outcomes generated by SEELUM for each of the Packages (and a combined Package) is provided in **Table 6.5**. below. A more detailed commentary on these results is provided in following pages.

Table 6.5: Modelling Results

Deskages	1a	1b	2	3	4	All
Packages	Rail (Core)	Rail (Reinstatements)	Mass Transit	Active Travel	Highways	All Packages
Transport Outcomes						
Δ Car Trips	(6,433)	(3,649)	(33,729)	(35,651)	6,088	(70,546)
Δ Rail Trips	36,542	7,067	(1,077)	(588)	(290)	41,278
Δ Bus Trips	(692)	(379)	59,749	(3,942)	(527)	52,293
Δ Active Trips	(945)	(628)	(21,809)	40,322	(1,129)	14,664
Δ Total Trips	28,472	2,411	3,134	141	4,143	37,689
Socioeconomic Outcomes						
Δ Population	5,652	577	1,340	41	724	8,084
Δ Employment	1,820	509	801	39	1,340	4,444
Δ GVA (£m)	270	30	81	9	111	495
Δ Carbon (Initial)	(6)	0	(19)	(21)	28	(20)
Δ Carbon (2050)	(4)	(3)	(17)	(11)	27	(6)

Trips are presented as trips per typical weekday Carbon is presented as thousand metric tonnes of carbon dioxide equivalents (KMTCD) These outputs show results from running interventions from 2018 to 2050. In the Strategic Programme Outline Case we will show results for these packages modelled to timelines tied to their delivery.



## Package 1a: Core Rail

The Core Rail Package delivers a significant boost to GVA (up to £270m per annum) and encourages mode shift from car to rail.

The modelling results suggest this Package could deliver a very significant increase in rail patronage – 20% higher than "Business as Usual" forecasts show.

Compared to other rail packages in the Area Study Programme, these results are significant, and should give investors confidence in the level of growth that could be realised through investing in the Brighton Main Line.

## Package 1b: Railway Reinstatements

#### The Railway Reinstatement Package delivers a modest boost to GVA (up to £30m per annum)

This Package delivers a material increase in rail trips (just under 4% compared to "Business as Usual"), which should help strengthen the case for investing in reinstating passenger rail services between Uckfield, Lewes, and Tunbridge Wells.

## Package 2: Mass Transit

The Mass Transit Package delivers transformational growth in bus journeys – as well as significant mode shift.

This Package would grow bus's mode share in the South Central Radial Area from 7% to 8.3%. It would also take near 38,000 car journeys off the roads each weekday.

This Package also provides a material boost to GVA (up to £80m per annum).

This Package makes a significant contribution towards achieving the vision and objectives of this study.

## Package 3: Active Travel

#### The Active Travel Package would boost cycling and walking by 3.5% and encourage mode shift from car to active travel modes.

This Package would also offset some of the abstraction from active travel generated by improvements in Public Transport (in Packages 1 and 2).

This Package would also make a significant contribution towards reducing carbon emissions in the South Central Radial Area.

## Package 4: Highways

The Highways Package delivers a significant boost to GVA (up to £111m per annum) but yields a modest increase in carbon.

The overall impact of the Highways Package on road, rail, bus, and active travel demand is relatively modest. However, by strengthening the resilience of transport networks, and by supporting housing and employment growth, this package unlocks significant economic benefits.

## **Combined Packages**

When the Packages are combined, they deliver a more prosperous South Central Radial Area, with lower carbon emissions and higher public/active travel mode share.

The combined impact of the Packages (when modelled together in SEELUM) reduce car trips by over 70,000, increase rail trips by 41,000, increase bus trips by 52,000, and increase active travel trips by just under 15,000 (all compared to the "Business as Usual" scenario). They also boost GVA by £495m per annum, while delivering a material reduction in carbon emissions.



## **Modelling Results Details (1 of 4)**

**Figure 6.3** below presents the change in weekday trips that arise at the end of the modelling period (2050) for each of the Packages and modes in the scope of this study. As expected, rail, bus, and active travel interventions all generate higher demand for their respective modes. The mass transit and active travel packages are effective in reducing car trips.

#### Figure 6.3: Change in weekday trips





## **Modelling Results Details (2 of 4)**

**Figure 6.4.** presents the same results as Figure 6.3 as a percentage of Business as Usual weekday trips. This highlights the relatively size of growth in rail and bus/mass transit trips that might be achieved if the Packages supporting these modes are delivered. It also highlights that the Strategic Highways Packages appear to have a negligible impact on car trips.

#### Figure 6.4: Change in weekday trips (%)





## **Modelling Results Details (3 of 4)**

**Figure 6.5** presents the travel outcomes from the modelling as a mode share. The Business as Usual mode share is shown in the bottom left. Together, the Packages generate significant mode shift to mass transit, moderate mode shift to rail, very little (net) change to active travel, and a reduction in car's mode share.

## Figure 6.5: Change in mode share (%)





🔝 19%

## **Modelling Results Details (4 of 4)**

**Figure 6.6** summarises the key socioeconomic outcomes produced by the model runs (by the year 2050). Together, the Packages deliver significant boosts to GVA. The greatest contribution to GVA growth comes from the Core Rail Package – which highlights the importance of the Brighton Main Line to the South Central Radial Area.

#### Figure 6.6: Socioeconomic Outcomes





## Trade Offs (1 of 2)

## Gross Value Added (GVA)

Most Packages generate a boost to population, employment, and (as shown in Figure 6.7. to the right), GVA. Together, these Packages deliver a higher GVA.

All packages contribute to GVA growth. The largest contributors to GVA growth are the Core Rail, Mass Transit, and Strategic Highways Packages.

The Rail Reinstatement Package makes a more modest contribution to GVA. However, as the cost of this package is a fraction of the Core Rail Package, this contribution appears to be proportionate to the level of investment required.

#### Figure 6.7: Change in GVA arising from Packages (£m per annum by 2050)



The 'Displacement Effect' represents the difference between the sum of the packages and the outputs realised when all packages are run together. In essence, this quantifies the element that is 'more than the sum of the parts'.



## Carbon Emissions

Most Packages contribute to the South Central Radial Area Study's goal of reducing carbon emissions. However, the Strategic Highways Package reduces many of the gains made through other interventions.

**Figure 6.8** provides a breakdown of the contribution of the Packages towards decarbonisation. The greatest impact arises from the Core Rail, Mass Transit, and Active Travel Packages.

It is important to note that the model results shown in Figure 6.9 do not reflect global policy interventions that will also be included in TfSE's Strategic Investment Plan. These will be presented in due course. They are likely to include significant efforts to decarbonise highways (faster) and use pricing signals to encourage even greater mode shift towards lower carbon modes. They should help significantly mitigate the impact of the Strategic Highways package.

#### Figure 6.8: Change in carbon emissions arising from Packages (initial impacts, KMTDC)





## Alignment with Problem Statements

#### In Part 2 and Appendix A we list 18 Problem Statements that the South Central Radial Area Study aims to address.

**Table 6.10** on the following page presents a qualitative assessment on the extent to which each package of interventions address each Problem Statement.

This assessment uses a simple scale shown below:

- ✓✓✓ Fully addresses Problem Statement
- ✓✓ Mostly addresses Problem Statement
- Partially addresses Problem Statement

Table 6.10 includes a column on the right under the heading 'All Packages'. The scores in this column represent the highest score assigned to each of the individual packages. If one package scores two ticks and all other packages score none, then the column 'All Packages' is also assigned two ticks.

# Table 6.10 (overleaf) shows that mostProblem Statements are fully addressed bythe Packages presented in this report.

That said, two Problem Statements are 'mostly' addressed, and two Problems Statements are only 'partially' addressed.

The Problem Statements that are not (yet) fully addressed relate to:

- reliance of freight on highways;
- accessibility;
- affordability and complexity of public transport fares; and
- integration and information.

The Area Study programme will include a global policy package of interventions that will be applied across all packages and areas.

These policies will be designed to directly address the gaps highlighted in Table 6.10.

## Alignment with Objectives

We have also assessed the extent to which the packages presented in this report deliver this study's Objectives.

**Table 6.9** below summarises the number of interventions in each Package that have a 'high' or 'very high' alignment with the objectives of the South Central Radial Study.

#### Table 6.9: Interventions and objectives

Objective	Interventions
Climate Change	25
Resilience	18
Planning	42
Economy	68
Society	62
Environment	15

Based on this analysis, we are confident that the packages developed for this study and presented in this report can help TfSE and its member authorities achieve the Vision and Objectives described in this study.



## Table 6.10: Problem Statement Mapping to Packages

Problem Statement	1a Rail (Core)	<b>1b</b> Rail (Reinstatements)	2 Mass Transit	3 Active Travel	<b>4</b> Highways	Combined Packages
Decarbonisation	$\checkmark\checkmark$	$\checkmark\checkmark$	$\checkmark\checkmark\checkmark$	44		<b>\$ \$ \$</b>
Climate resilience	<b>√</b> √ √	$\checkmark \checkmark \checkmark$	$\checkmark\checkmark\checkmark$	~~		<b>V V V</b>
Freight reliance on highways	<b>√</b> √	✓				
Housing (need plan planning)	<b>~ ~ ~</b>	$\checkmark \checkmark \checkmark$	$\checkmark\checkmark\checkmark$	<b>√</b> √	<b>~ ~ ~</b>	<b>V V V</b>
Economic growth	<b>√</b> √ √	$\checkmark\checkmark$	$\checkmark\checkmark\checkmark$	✓	<b>~ ~ ~</b>	<b>s s s</b>
Rural communities	✓	$\checkmark \checkmark \checkmark$	$\checkmark\checkmark$	44	<b>√</b> √	<b>J J J</b>
Accessibility	✓	$\checkmark\checkmark$	$\checkmark\checkmark$	✓		$\checkmark\checkmark$
Cycle network gaps				<b>~√√√</b>		<b>s s s</b>
Active travel mode share				<b>~√√√</b>		<b>V V V</b>
Mass Transit gaps			$\checkmark\checkmark\checkmark$		✓	<b>V V V</b>
Interurban public transport gaps		$\checkmark \checkmark \checkmark$	$\checkmark\checkmark\checkmark$		✓	<b>II</b>
Information and ticketing	✓	✓				✓
Fare complexity and cost	✓	✓				✓
Rail network resilience	$\checkmark \checkmark \checkmark$					$\checkmark \checkmark \checkmark$
Rail network capacity	$\checkmark\checkmark\checkmark$	$\checkmark \checkmark \checkmark$				<b>V V V</b>
Rail network connectivity	$\checkmark \checkmark \checkmark$	$\checkmark \checkmark \checkmark$				<b>V V V</b>
Highway congestion/air quality hot spots	✓	✓	✓		<b>~ ~ ~</b>	<b>A A A</b>
Highway capacity for growth			✓		~~~	<b>V V V</b>



## Part 7 Next Steps

## **Recommendations**

In conclusion, this report recommends that the following seven Packages of Interventions for the South Central Radial Area Study are taken forward into the next stage of development (Stage D – see overleaf for more details).

	<ul> <li>Package 1a: Core Rail Package</li> <li>Croydon Area Re-modelling</li> <li>Faster Brighton Main Line</li> <li>Faster Arun Valley services</li> <li>Faster East Coastway services</li> <li>Keymer Junction/Wivelsfield</li> <li>Brighton Station Platform</li> <li>Eliminate Joining and Splitting</li> <li>Reinstate Cross Country</li> <li>North East Horsham Station</li> <li>Newhaven Port Freight Access</li> <li>Electrification</li> <li>London Terminal Capacity</li> <li>Newhaven Rail Freight Improvements</li> </ul>	<ul> <li>Package 2: Mass Transit</li> <li>Fastway expansion <ul> <li>Crawley/Gatwick – Horsham</li> <li>Crawley/Gatwick – East Grinstead</li> <li>Crawley/Gatwick – Burgess Hill –</li> <li>Haywards Heath</li> <li>Crawley/Gatwick – Redhill/Reigate</li> </ul> </li> <li>Rural and interurban bus service improvements</li> <li>Strategic Mobility Hubs at Three Bridges and North Brighton</li> <li>Improved Rural Demand Responsive bus/taxi services</li> <li>Integrated and simpler fares, ticketing, and marketing</li> </ul>	<ul> <li>Package 4: Highways</li> <li>A23 Junction improvements</li> <li>M23 Gatwick Access</li> <li>M23 Redhill New Junction/Link Road</li> <li>A22 Godstone</li> <li>A22 Godstone</li> <li>A22 Polegate – Hailsham</li> <li>A22 Smart Road Trial</li> <li>A2270/A2101 MRN Scheme</li> <li>A26 Uckfield Bypass</li> <li>A24 Leatherhead – Horsham</li> <li>A26 Lewes – Newhaven</li> <li>A264 Horsham – Crawley</li> <li>Crawley Western Link Road</li> <li>A272/A283 AQMAs</li> </ul>
<ul> <li>Package 1b: Railway Reinstatements</li> <li>Reinstate Uckfield – Lewes – Tunbridge Wells</li> <li>Develop bus and active travel benefits on former rail routes</li> </ul>		<ul> <li>Active Travel</li> <li>Local and regional cycleways</li> <li>NCN Crawley – Brighton</li> <li>NCN Crawley – Chichester</li> <li>Avenue Verte</li> </ul>	<b>Global Policy Package</b> To be defined but likely to include new mobility, rural connectivity, freight, demand management, and accelerated decarbonisation interventions


Figure 7.1 below summarises how each Package contributes to delivering our vision for the South Central Radial Area.

Figure 7.1: Vision for the South Central Radial Area





### **Next Steps**

This report has summarised the work undertaken in the third of the five stages underpinning the South Central Area Study.

**Figure 7.1** shows the stages and steps that are being delivered for this study. This report concludes **Stage C**, which focused on options generation and assessment.

The next stage for this study is **Stage D**. The purpose of this this stage will be is to produce outputs to make the case (to government and others) for investment in the South East's transport networks. This Stage will fully mobilise in October 2021.

To ensure that each area study meets the vision, goals and priorities of the Draft Transport Strategy, an Integrated Sustainability Appraisal (ISA) will be developed for each of the five Area Studies – shown below as **Stage E** – which will also report by March 2022.

#### Figure 7.1: Overview of the South Central Radial area study stages and steps







# Appendix A Problem Statements

#### **Global Issues**

- 1. Transport is not de-carbonising fast enough
- 2. Climate change threatens the resilience of the transport network
- 3. Freight is heavily reliant on the highway network, especially for first-mile-last-mile deliveries
- There is a recognised need for housing and communities – but in the right places, supported by the right infrastructure, planned to deliver sustainable transport outcomes.

#### Economy

5. The area's economy is not growing as fast as other areas of the South East, and appears to be too reliant on a small number of industrial sectors.

#### Access

- 6. Rural communities are being left behind in digital, active travel, and public transport connectivity.
- 7. Too many transport services and networks are inaccessible to all users.

#### **Active Travel**

- 8. There are significant gaps in regional, national, and international cycle networks in the area.
- 9. Active travel mode share is too low for many short journeys in the area.

#### **Public Transport**

- The Sussex Coastal conurbation the 2nd largest conurbation in the South East – does not have the mass transit systems it needs (and deserves).
- 11. There are gaps in the quality of interurban public transport provision, particularly in rural areas.
- 12. Public transport information and ticketing arrangements are not sufficiently coordinated nor adequately integrated, particularly across transport modes.
- 13. For many people, public transport fares are too high and too complicated.

#### Rail

- 14. Resilience is relatively poor on the Brighton Main Line – almost every passenger rail service passes through a single bottleneck at East Croydon
- 15. Spare capacity is limited on the Brighton Main Line and the allocation of this capacity does not meet the needs and/or aspirations of all the area's stakeholders
- Connectivity is relatively poor for communities served by the Arun Valley Line, East Coastway Line, and Oxted Line (especially when compared to the Brighton Main Line).

#### **Highways**

- 17. There are several congestion, road safety, and air quality "hot spots" in the area, particularly in Town Centres and at major junctions.
- 18. The area's major highways do not have enough capacity to accommodate planned housing (and potential airport) growth.



#### While many stakeholders in the South Central Radial Area recognise the need to decarbonise, this is not happening fast enough.

The trajectory shown in the figure to the right indicates, the South East will not reach a position of net-zero carbon emissions by transport by 2050 – which is now a legal requirement supported by domestic legislation and international agreements (e.g. Paris).

Several Local Transport Authorities in the South East have committed to more aggressive decarbonisation targets (e.g. reaching net-zero by 2030).

Electric vehicle take-up is low and there are some areas with very poor access to charging points. A step change in the electrification of highway transport and modal shift away from fossil fuel transport to electric/healthy transport is needed if the area is to reach its climate commitments.

The South East's rail network, while almost entirely electrified, includes some sections of diesel operations, which also contribute to this challenge.



Source: Steer analysis of BEIS data



The transport networks serving the South Central Radial Area are vulnerable to the effects of climate change and in many areas are showing signs of poor resilience.

The South East's transport network cuts across several areas that are already vulnerable to flooding and temperature extremes. Some of these "funnel" significant flows over bridges and cuttings that do not have adequate diversionary routes (and creating better routes would be costly). For example, the A259 runs close to the coast in many places, and some sections of the M23 run through several flood plains. The South East's railway network is relatively old and features numerous tunnels and cuttings.

Climate change is likely to increase the frequency and strength of weather events (and extreme heat in summer). The outcome of this problem is increased operations, maintenance and renewal costs, which will be borne by transport users and wider society. Funding will be needed for this (which is not easy to secure in the current economic climate). **Examples of climate change resilience challenges** 



Source: BBC



# 3 Freight is highly reliant on highways, especially for first-mile-last-mile deliveries

Freight is very reliant on highways and rail freight is losing ground.

Rail freight mode share is low nationally (around 5%, based on tonnage) and, according the ORR, data, has declined in terms of freight train movements on the national network. There is, however, some promising signs of recovery as rail freight grew in 2020. An electric rail freight sector should be well placed to provide a low carbon alternative – although it is recognised freight is in competition with passenger rail for timetable paths.

It should be possible to achieve higher mode shares. However, there are significant barriers to rail freight in the South East, particularly for routes to/from the Channel Ports. These barriers include a lack of freight terminals, poor access across London, high access charges on High Speed 1 and the Channel Tunnel. Inadequate gauge clearance also affects rail routes serving Dover (see right). Network Rail aspires to create a route between the Channel Ports and the Midlands to address this constraint.

#### Rail network gauges (2017)



Map source: Network Rail, freight Network Study, <u>https://www.networkrail.co.uk/wp-content/uploads/2017/04/Freight-Network-Study-April-2017.pdf</u> Freight statistics source: <u>https://dataportal.orr.gov.uk/media/1738/freight-rail-usage-performance-2019-20-q4.pdf</u>



There is a recognised need for housing and communities in the South Central Radial Area – but in the right places, supported by the right infrastructure, and planned to deliver sustainable travel outcomes.

The fragmented nature of the planning system and lack of effective strategic planning makes it difficult to integrate spatial, transport, and economic planning. The area is also heavily constrained by the landscape and layout of urban areas.

To accommodate a possible 360,000 new residents (see **Figure 3.3** on **page 16** of this report) there may be a need for additional housing and employment – and this is planned. Recent discussions with government suggest this figure may grow, albeit with more of a focus on delivery in urban areas.

There is risk that housing growth will result in unsustainable transport patterns as many housing developments are being delivered, some distance away from shops, town/city centres, commercial services, public services, employment sites, and transport hubs.



#### Affordability of housing in the South Central Radial Area (from Figure 3.3)



### The area's economy is too reliant on a small number of industrial sectors

The area's economy is not growing as fast as other areas of the South East and appears to rely too much on a small number of industries.

In 2018, TfSE identified industrial sectors that were deemed to be high value, high growth industries. Employment by each key sector in the South Central Radial Area is listed in **Table 1.1 in the Evidence Base Report**. This data identified a high reliance on the Financial Services and Aviation industries. Respectively, 91% and 90% of total jobs in the South East in these sectors are in the South Central Radial Area.

The COVID-19 pandemic has highlighted the risks of relying on a particular industry. The challenges facing the aviation industry are well document. **Figure 2.9 in the Evidence Base Report** highlights the portion of the workforce in the Gatwick Diamond area that participated in the furlough scheme as a result of pandemic travel restrictions.

Furthermore, there are concerns about productivity and growth gaps in the area. The data presented in the figure to the right highlights relatively low GVA growth in the area, particularly in the north.



#### Varying socioeconomic outcomes in different areas of South East England

Source: ONS (2008 and 2018)



Rural communities in the South Central Radial Area have significantly poorer access to public transport, Mobility as a Service providers, and high-speed broadband compared to urban areas.

This means it will be harder for rural communities to:

- Work remotely;
- Access future mobility technologies;
- Access emerging Mobility as a Service services;
- Access public transport networks; and
- Attract businesses that rely on technology and/or public transport.

This promotes a high reliance on private motoring in rural communities.

While many rural areas are prosperous, there are pockets of high levels of deprivation in rural parts of the South Central Radial Area.

There is also a risk that inequality in access to broadband will result in wider inequality in socioeconomic outcomes.

#### Public Transport connectivity (from Figure 1.19)





While there has been good progress in improving accessibility in recent years, significant issues remain.

Accessibility – in the broadest terms – is a key barrier to many users. The Williams Rail Review identified this is a key challenge for the rail industry.

The DfT's "Access for all" programme has unlocked some investment in some rail stations. However, as the table to the right shows, there is a need for more progress.

Other examples where improvements should be considered include:

- Improving the accessibility of bus fleets and rail rolling stock;
- Making it easier to plan, buy, and use public transport services;
- Improving access to public transport for passengers with hearing, vision, and/or cognitive needs;
- Improving walking and cycling facilities (many people with additional needs rely on cycles as their primary form of mobility); and
- Making public spaces (e.g. town centres) more accessible.

#### Accessibility at train stations (% stations offering fully accessible provision at January 2019)

	Accessible					
	Accessible	A	<b>T</b>	Netterslite	Chan from	N 4 - In 111
	ticket	Accessible	I rain ramp	National Key	Step free	Mobility
	machines	ticket office	access	toilets	access	set down
Great Britain	53%	21%	73%	18%	61%	28%
East of England	80%	17%	73%	33%	72%	23%
East Midlands	39%	17%	41%	20%	77%	16%
London	87%	33%	60%	24%	44%	24%
North East	24%	13%	98%	13%	84%	47%
North West	16%	18%	96%	8%	63%	17%
South East	89%	24%	79%	32%	56%	46%
South West	51%	15%	74%	22%	57%	60%
West Midlands	37%	16%	82%	25%	67%	33%
Yorkshire and the Humber	24%	8%	99%	8%	67%	34%
Scotland	40%	27%	35%	4%	51%	10%
Wales	37%	18%	94%	10%	79%	17%
Кеу	Lowest proportion of stations			Highest proportion of stations		

Data from National Rail Enquiries, Knowledgebase XML API, accessed 24 January 2019

Source: House of Commons Library (2019) https://commonslibrary.parliament.uk/how-accessible-are-britains-railway-stations/



The existing cycle network is not at a consistent standard does not support wider cycling participation, and there are strategic gaps in the parts of the area's cycle network.

Sustrans were recently forced to downgrade sections of the National Cycle Network (NCN) in this area (e.g. between Crawley and Brighton) due to the deteriorating safety risk on cycling corridors in these areas.

TfSE analysis has shown a lower proportion of residents in the South East live close to the NCN than residents in neighbouring regions. This is a metric that many stakeholders wish to see improve.

The South Central Radial Area is a popular area for leisure cycling. Several London 2012 cycling events were held at the northern end of the corridor, and similar events such as Ride London have been held in the area in the past. The area is also home to the international cycleway "Avenue Verte", which follows a long route and is supported by variable quality infrastructure (e.g. significant sections are unpaved and/or unlit).

#### Cycle networks in the South Central Radial Area



*Source: Openstreetmap (2021)* 



#### Active travel is low in the South Central Radial Area, especially for shorter trips and journeys to work.

The figure to the right, which was published in TfSE's Transport Strategy for the South East in 2021, shows low (and variable) levels of cycling participation across the South East. Cycling participation is especially low in Horsham, Mid Sussex, and Tandridge districts. The TfSE strategy also presents data showing that fewer than 1 in 5 residents cycle once or more a week. Travel To Work data also shows cycling has a low mode share, particularly outside Brighton and Hove.

Every Local Transport Authority on this corridor wants to see a step change in cycling participation in their areas, but the infrastructure is not available to support this ambition. Furthermore, cycling infrastructure is seen as an enabler for new technologies such as electric bikes/scooters. A lack of infrastructure could be holding the region back from the opportunities these technologies offer.

## National trail National Cycle Route Avenue Verte % of residents who cycle once a week or more: <5% 5% - 10% 10%-15% 15% - 20% ■ >20% Source: N Sustrans Haywards Heath/ Burgess Hill

#### Cycle participation and national/international cycle routes in the South East





#### Mass transit systems in major conurbations in the UK



of its residents.

The Sussex Coastal conurbation – the 2nd

Littlehampton/Newhaven ("Sussex Coast")

network, it is not served by a mass transit

largest conurbation in the South East does not have the mass transit systems it

While the Brighton/Hove/Worthing/

built up area is served by a good bus

system such as Light Rapid Transit, Bus

Rapid Transit, or underground system.

This means the conurbation relies on

conventional buses, which deliver slower

suburban rail services, which are relatively

infrequent, are not available to all, and do

not adequately serve commercial centres.

conurbations do not benefit from the

on the car and/or relatively slow (i.e.

accessibility, connectivity, and quality of mobility that is available in other cities.

This forces residents and business to rely

<8mph average speed) bus service, which

undermines the competitiveness of the area's largest cities and the quality of life

This means residents in these

iourneys than alternative systems, and

needs to thrive.

Bus patronage is low and (other than in Brighton and Hove) is declining.

The figure to the right shows the percentage of the population travelling to work by bus at the time of the 2011 census. **Figure 1.21 from the Evidence Base Report** shows recent trends in bus patronage. In East Sussex, Kent, and Surrey, bus use declined by more than 10% over the period 2009/10 – 2019/20. In contrast, bus use in Brighton and Hove has increased by 19% over the same period (bus patronage has broadly been stable in West Sussex over this period).

This evidence points to a bus industry that – outside Brighton and Hove – serves few Travel To Work journeys and is in decline. Bus patronage is particularly low in rural areas as well as in fast growing Major Economic Hubs such as Burgess Hill/Haywards Heath and Horsham.

The Fastway network in Crawley and Brighton and Hove bus network point towards the opportunity for bus in the South Central Radial Area.

#### Bus share of Travel To Work flows





#### Public transport information and ticketing arrangements are not sufficiently coordinated nor adequately integrated, particularly across transport modes

Parts of the South East are included in the London Travelcard area and are included in Transport for London's contactless travel arrangements. However, outside the London area, there are few examples of:

- Integrated journey planning tools;
- Integrated, multi-modal fares (noting some areas have access to PlusBus);
- Zonal fares systems (e.g. centered on Solent and/or the Sussex Coast conurbations); and
- Integrated, multi-modal payment systems.

All the above makes it harder to plan, pay for, and complete multi-modal journeys in the South East. None of the conurbations in the South East are currently served by dedicated multimodal planning apps – although this is a fast-developing area of interest and third parties may provide a solution soon.



Extent of London Pay-As-You-Go payment systems in South East England

Source: Department for Transport "Pay-as-you-go on rail" consultation (2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\_data/file/776998/payg-rail-consultation-doc.pdf



Stakeholders have cited the price of rail tickets and the complexity of ticketing as a disincentive to travelling by public transport.

The perception that rail fares are high means it is harder to persuade people to change from the car to rail. This is particularly the case for families and for those having to travel via London (even if their journey is not to/from London).

While Season Tickets offer better value for money (if they are used in full), headline figures of £6k+ annual season tickets is offputting to many and may disincentivise people from moving to the South East.

The complexity of the tickets offered also puts people off using the railway. As an example: a myriad of different fares are offered between Gatwick and London. The Williams Rail Review has identified the complexity of fares as an issue.

It is acknowledged that this is a complex topic and there are examples of low fares available during off peak periods, particularly on longer distance journeys (which do not make up a significant portion of journeys in the South East). **Real terms increase in costs of public transport and motoring** 

# Retail Prices Index (RPI): Bus and coach fares, rail fares and motoring expenditure, 1987–2019<sup>25</sup>





Almost every passenger rail service passes through a single bottleneck at East Croydon.

According to Network Rail, the Croydon area is the busiest, most congested and most complex part of the country's rail network.

The lack of capacity at East Croydon station and the complex series of junctions north of Croydon, the Selhurst triangle, delays trains across the Brighton Main Line and the wider network every time an incident occurs.

It also means there is no capacity to run more trains to meet future passenger growth, which will lead to overcrowding in the years ahead unless action is taken.

The key bottlenecks in the area include East Croydon Station (which only has six platforms), Windmill Bridge (which only allows five tracks), and the Selhurst Triangle (which includes flat crossings).

There are also resilience challenges further down the Brighton Mainline, notably for sections where tracks reduce from four to two and around Gatwick Airport.

#### **Croydon Bottleneck**



The images presented above (also from Network Rail) illustrate proposals to address many of the issues highlighted in this Problem Statement.



Source: Network Rail



Capacity is limited on the Brighton Mail Line, and the allocation of this capacity does not meet the needs and/or aspirations of all the area's stakeholders.

The railway timetable is designed around constraints on the Brighton Main Line to ensure that services operating from locations such as Littlehampton and Brighton to London (and beyond) are timed to accommodate capacity bottlenecks closer to London. The rest of the timetable has to "fit around" whatever is left over from this capacity allocation process. The figure to the right illustrates the challenges planners face in balancing radial and orbital journeys on the Brighton Main Line.

In recent years, several "paths" (e.g. "slots") that used to support cross country services (e.g. Portsmouth/Brighton – Reading/Midlands/North) have been reassigned to radial services. This has slowly eroded the South Coast's connectivity to the rest of the UK.





Source: Project Mapping http://www.projectmapping.co.uk/Reviews/Resources/TSGN%20Travelling%20Wolf.jpg



# 16 Rail connectivity is relatively poor off the Brighton Main Line

Connectivity is relatively poor for communities served by the Arun Valley, Coastway, and Oxted lines.

The differences in connectivity provided is especially stark when compared to the excellent connectivity provided by the Brighton Main Line.

The slower speeds off the Brighton Main Line reflect the alignment of the track, signalling arrangements, and the passenger rail service calling pattern.

Furthermore, there are gaps in the rail network (e.g. Uckfield - Lewes) and poor integration between South Coast rail services and local bus services. This is particularly evident in fares, retail, and ticketing (integrated tickets and zonal fares are only available for London services).

The difference in rail connectivity means places like Eastbourne and Bognor Regis may need to "work harder" to attract investment compared to better connected Major Economic Hubs such as Brighton and Hove. This may explain why areas like Bognor Regis have generally weaker socioeconomic outcomes than Brighton.



#### Typical average speeds on the South Central Radial Area's railways

0 5 10 15 Miles Sources: © OpenStreetMap contributors, Contains OS data © Crown copyright and database right (2019), Natural England

Source: Steer analysis



area's economy, environment, and quality of life for residents. businesses. and The figure to the right, which is based on Figure 1.15 in the Evidence Base Report. shows congestion hotspots on the highway network in the South Central Radial Area Congestion, road safety, and air quality hot spots tend to arise at the same location. This is often where highway infrastructure ham is not adequate to accommodate the Havwards traffic demand placed upon it. In the South eath/Burg Central Radial Area, this is observed at major junctions, town and city centres. and on some sections of the Strategic and Congestion undermines the efficiency of Boar the transport network and the economy, while poor safety and air quality harms human heath. These hotspots are often TfSE area Congestion 41% - 60% hostile environments for vulnerable road South Central Radial area AM peak as % of night time speed \_\_\_\_\_ 61% - 80% 15 20 < 40% users and can act to deter people from 81% - 100%

**Congestion hot spots in the South Central Radial Area** 

Sources: © OpenStreetMap contributors Contains OS data © Crown copyright and database right (2019).



Pitney Bowes Speed Profiles.

Maior Road networks.

choosing to walk or cycle in these areas.

These hotpots can significantly blight an

visitors.

Building on Problem Statements 4 and 17, planned housing growth will only serve to add pressure to the highway network.

The figures below (from **page 17** of this report) show the housing and employment growth planned for this area. There is clearly an imbalance in employment and housing growth in some areas.

The area is expected to accommodate significant housing growth, particularly in the Horsham, Haywards Heath, and Burgess Hill areas. The pattern of development and the apparent imbalance of housing growth versus job growth (the latter is expected to be more concentrated on the Sussex Coast and in the Gatwick Diamond area) is likely to drive higher demand for highway capacity. This in turn is expected to place pressure on parts of the highway network that already experience regular congestion. There is a risk that many of the congestion, safety, and air quality issues highlighted in the previous page could worsen if not action is taken to mitigate these impacts.

#### Housing allocations in the South Central Radial Area





# For further information please contact

# South East

Sarah Valentine TfSE Client Project Manager Sarah.Valentine@eastsussex.gov.uk

Steven Bishop Technical Advisor Programme Director Steven.Bishop@steergroup.com

John Collins South Central Radial Area Study Project Manager John.Collins@steergroup.com

Alan Cowan South Central Radial Area Study Technical and Stakeholder Lead <u>Alan.Cowan@wsp.com</u>

DISCLAIMER: This work may only be used within the context and scope of work for which Steer Davies & Gleave Ltd. trading as Steer was commissioned and may not be relied upon in part or whole by any third party or be used for any other purpose. Any person choosing to use any part of this work without the express and written permission of Steer shall be deemed to confirm their agreement to indemnify Steer for all loss or damage resulting therefrom.