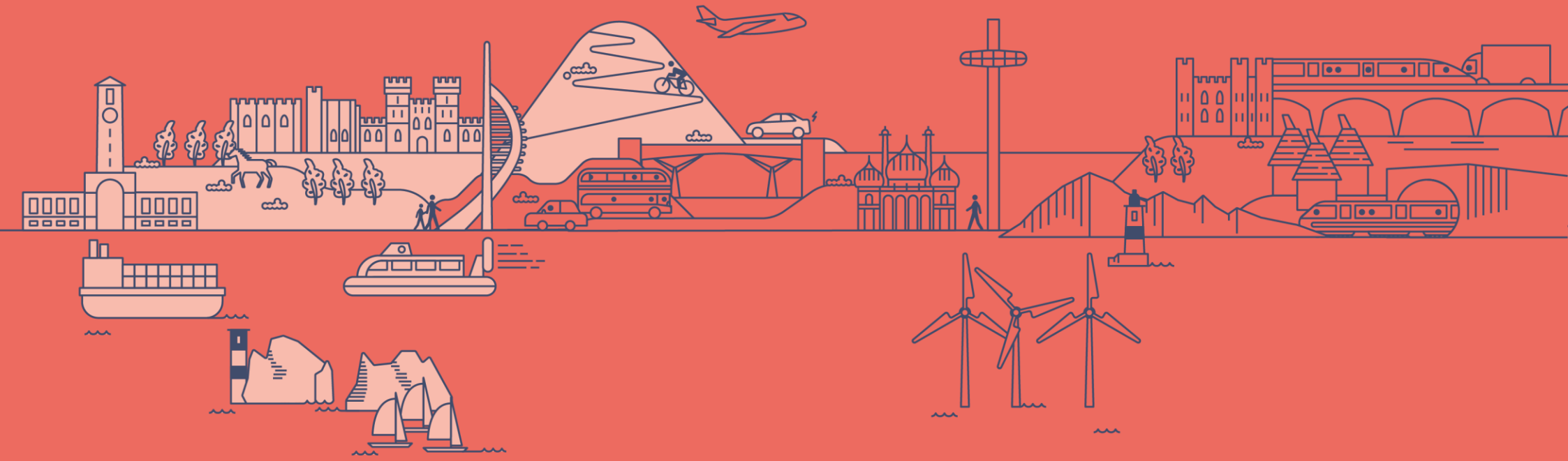
TRANSPORT FOR THE South East



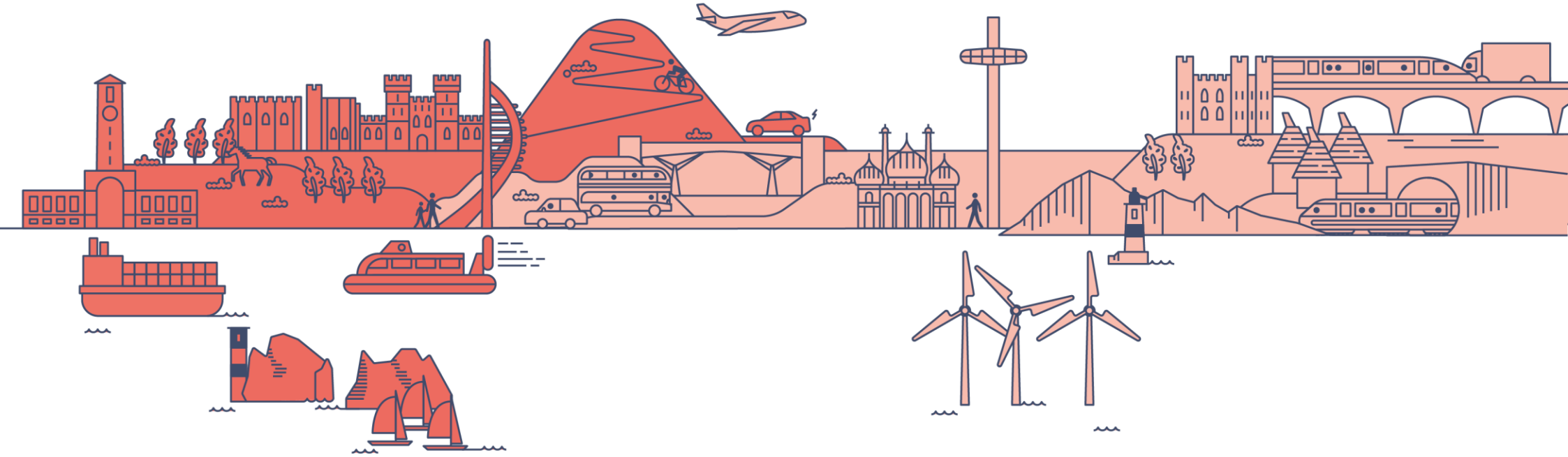
South West Radial Area Study

Options Assessment Report

Version 1.0

January 2021

Contents



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 cross-regional rounds 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.

Process

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

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

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

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

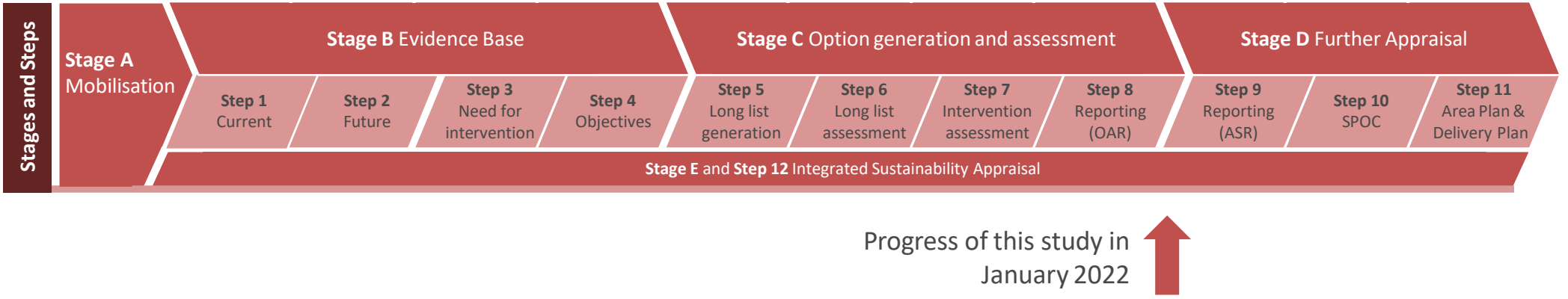
Stage B also identified corridor specific transport issues and defined the study's Vision, Objectives, and Problem Statements.

At the time of writing, the Study had just completed **Stage C (Options Generation and Assessment)** and 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 seek to ensure objectives, problem statements and interventions can be achieved through sustainable measures.

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



Structure of this Report

Purpose

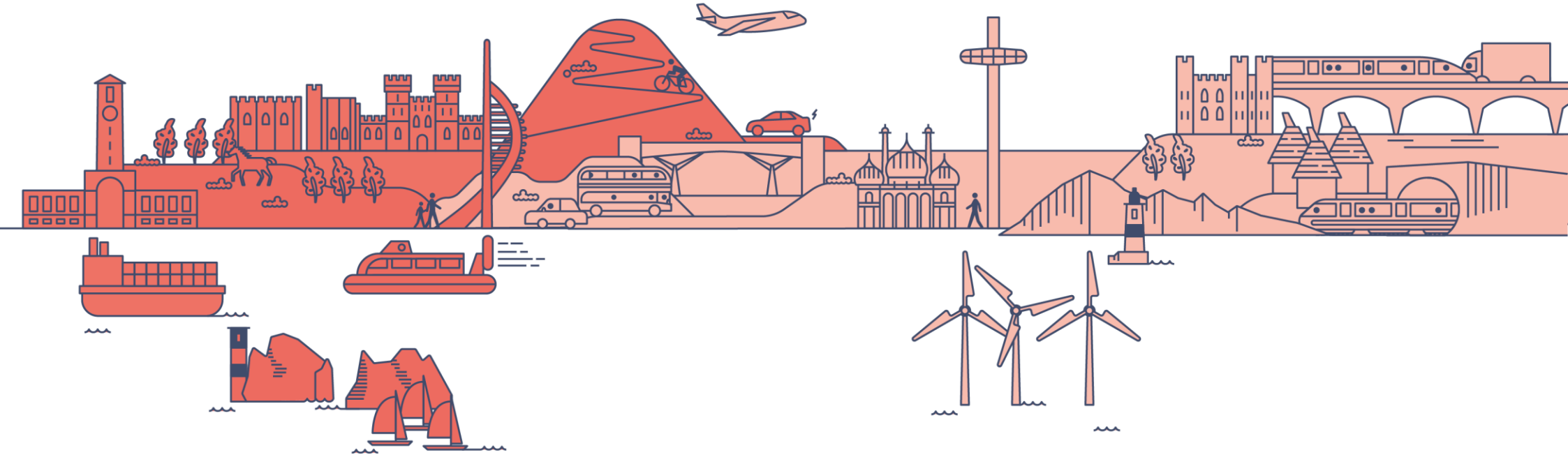
This report summarises the process the Project Team executed to:

- 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 outcomes for the South West Radial Area Study.
- Understand trade offs and, working with key stakeholders, refine 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 West 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 focused 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 qualitative 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 (SEELUM) 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 West Radial Area

The South West Radial Area Study encompasses the strategic radial corridors between South West and West London and the Western and South Western boundaries of the TfSE area. The South West Radial Area is home to multiple major economic hubs on the Greater London boundary and on the South Coast as well other major economic hubs within Berkshire, Surrey and Hampshire.

Socioeconomic Profile

The South West Radial Area is socially, economically, and environmentally diverse. It has some of the most deprived areas in the country as well as areas of high economic productivity and prosperity.
It is home to some of the country's most iconic natural and historic environments and some of the UK's most distinctive places (such as the Isle of Wight, Southampton, Portsmouth and Guildford).

The varied strengths and weaknesses of the South West Radial Area make planning a challenge. There are complex interdependencies, constraints and in some cases, conflict between competing pressures and aspirations in the area.

Despite these challenges, it is this diversity of the area that makes it such an appealing place to live and work. This study will seek to build on this diversity to achieve the ambitions of the people who live here.

Transport Networks

The South West Radial Area is served by a transport network that, at present, provides better quality infrastructure to and from London, and less developed infrastructure across the rest of the area.

The area has several important ports, including the Port of Southampton and Portsmouth International Port. It is also home to London Heathrow Airport and Southampton International Airport.

Some of the area's cities benefit from high quality bus services, but in general public transport services are varied.

Key Challenges

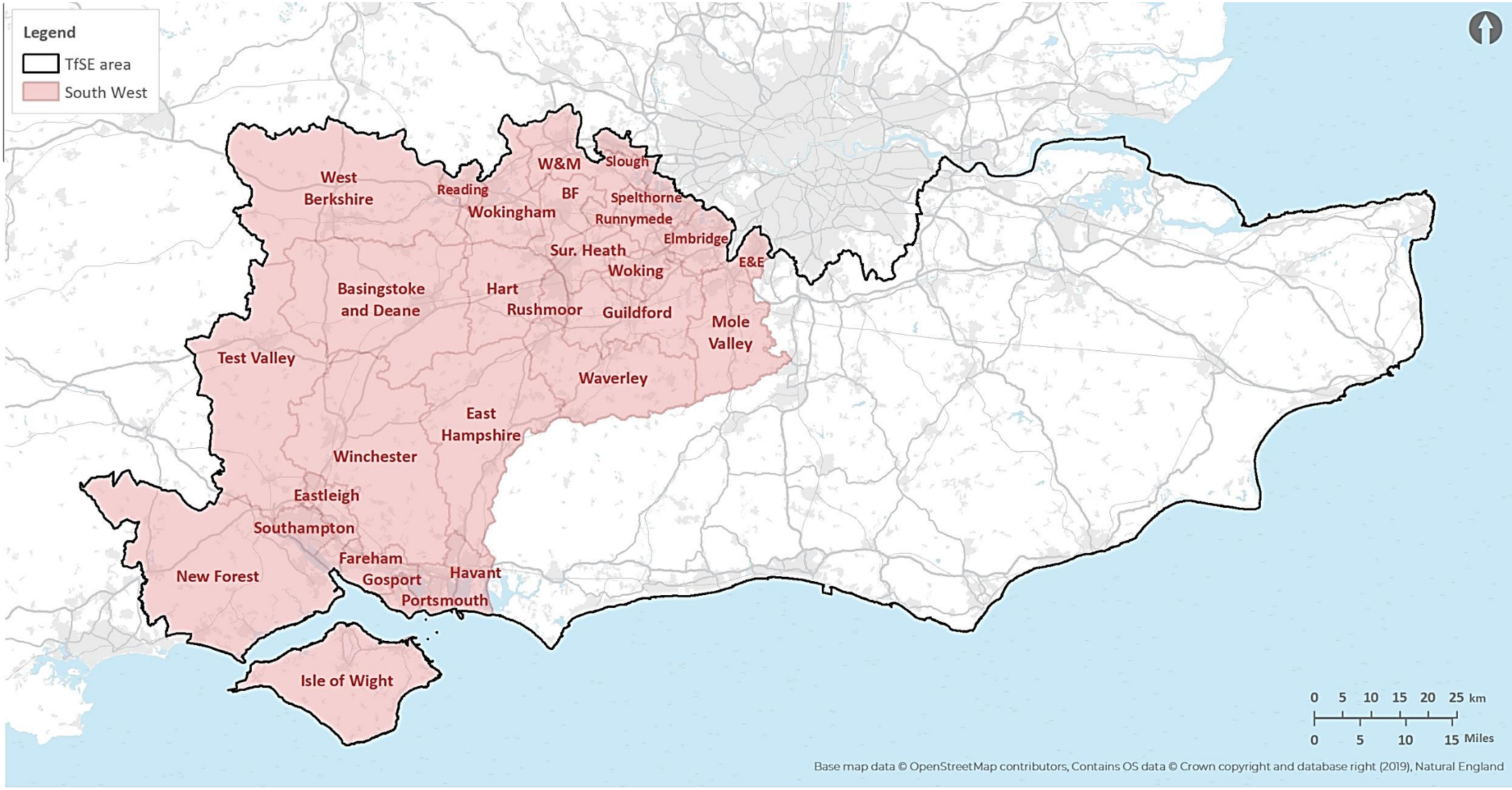
In Stage B (Evidence Base), this study identified several challenges and opportunities that need to be addressed by a holistic transport strategy. These are summarised in **Table 1.1** to the right.

Table 1.1: Challenges and Opportunities

Challenges
Access to ports, particularly ABP Southampton (constraining its expansion) and challenges of accessing Portsmouth International Port.
Sustainable surface access to Heathrow Airport from the South East area is poor.
Congestion along the M4, M3 and A3, and South Western Main Line capacity constraints impacting on journey times, reliability, and ability to support new development.
Journey times by rail to London from Portsmouth are notably longer than from Southampton.
Opportunities
Potential for additional rail access to Heathrow from the south and west, plus mass rapid transit (MRT) solutions.
The benefits that MRT could bring to some of the large conurbations (e.g. Thames Valley, South Hampshire) and how this might sit alongside other interventions that are planned or under construction.
Improved rail capacity and reliability on the South Western Main Line through application of digital signaling alongside targeted infrastructure upgrades (e.g. Woking Area Capacity Enhancement).
Opportunities for demand management and other local sustainable transport and behaviour change interventions.

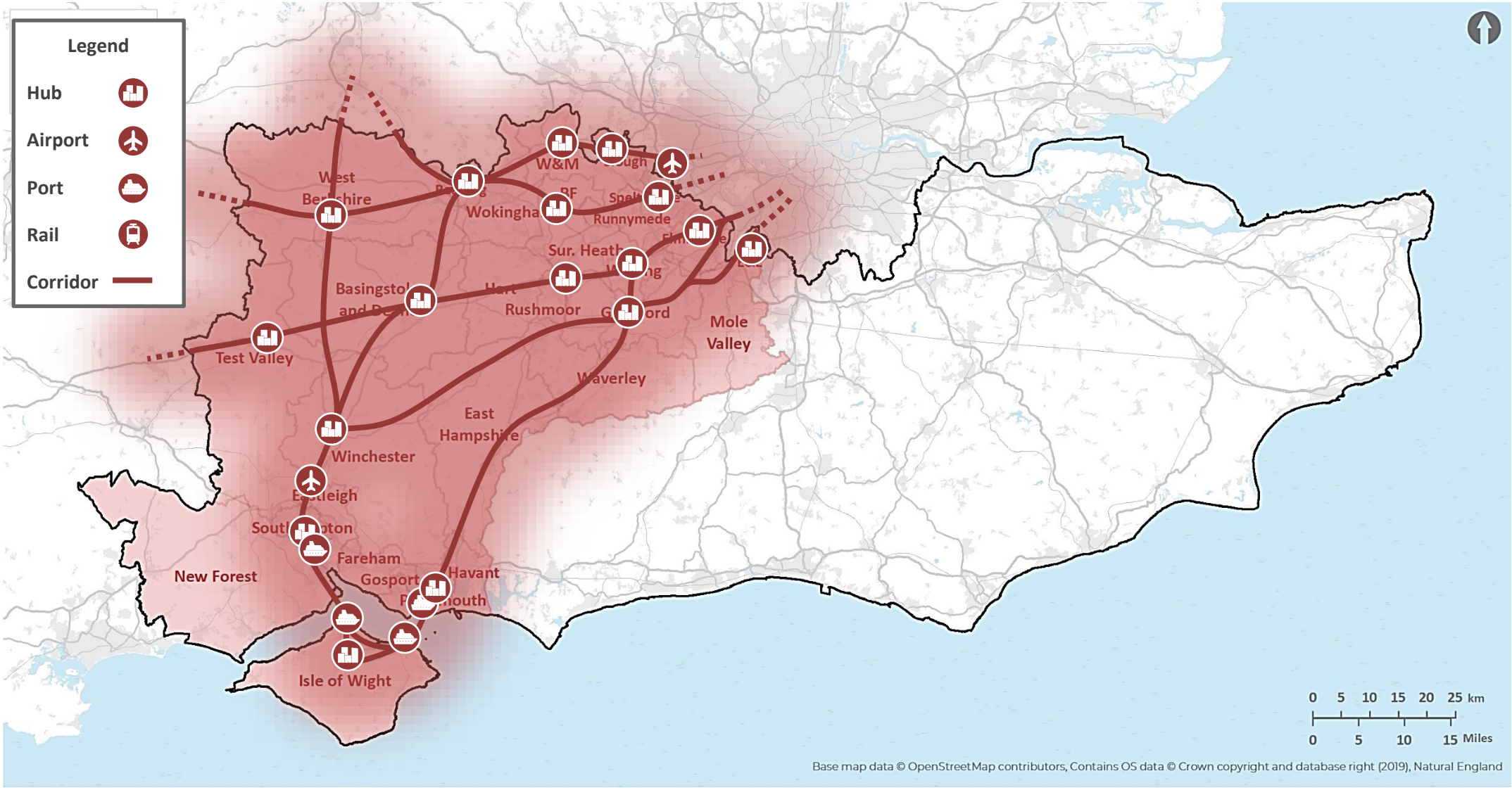
South West Radial Area Study Corridors and Planning Authorities

The South West Radial Area Study encompasses the strategic radial corridors between South West and West London and the Western and South Western boundaries of the TfSE area. The Local Planning Authorities in this area are listed in the map below. The area is primarily mirrored by the Enterprise M3 and Solent Local Enterprise Partnerships.



South West Radial Area Study Major Economic Hubs and International Gateways

The South West Radial Area encompasses major economic hubs on the Greater London boundary and on the South Coast as well other major economic hubs within Berkshire, Surrey and Hampshire. The area is home to a number of gateways with Southampton Port and Airport, the Port of Portsmouth and the ferry ports on the Isle of Wight.



Key Actors

Project Team

The South West 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 most of the Evidence Base development that formed Stage B of this project. Steer is supported by:

- **Atkins**, who led the Options Stages of the project (Stage C); and
- **WSP**, who provided 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 Analysis 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 West Radial Area Study 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 West 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 North Wessex Downs AONB.
- **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.

Stakeholder Engagement

Tier 1 Stakeholders

Most Tier 1 Stakeholders were invited to join the South West 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 West Radial Area Study Forum.

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

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

The second workshop focused 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.

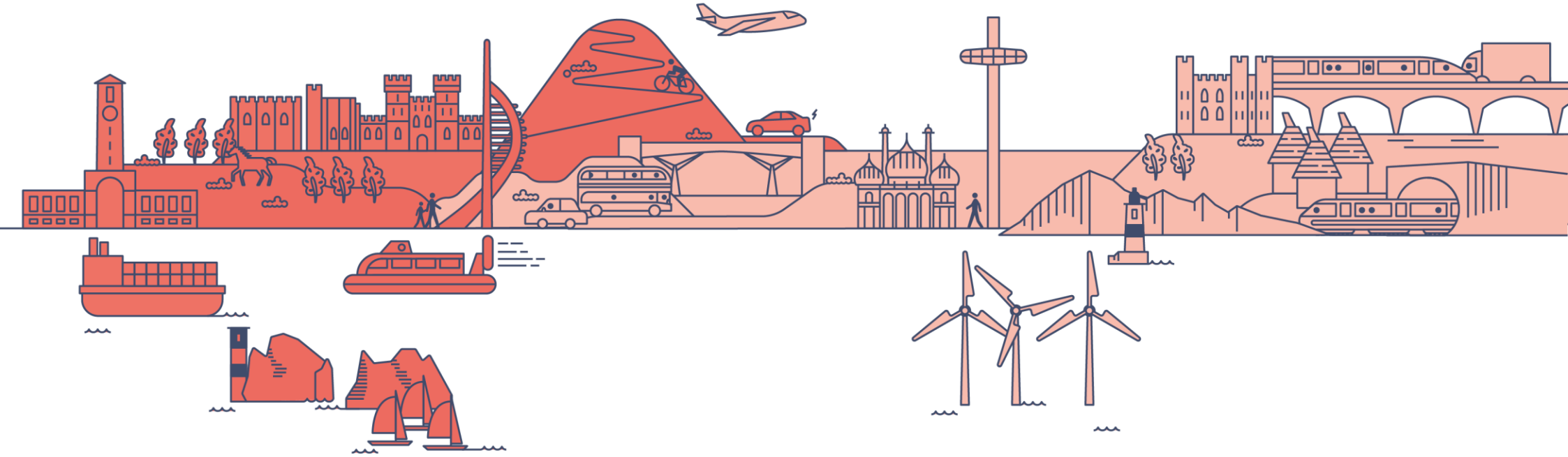
Other Stakeholders

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 West Radial Area Study.

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

It also explored projections for housing, population and employment growth, and considered the implications of 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 West Radial Area.

The insights drawn from this exercise and the Evidence Base was used to create a shared **Vision and Objectives** for the South West Radial 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 West Radial Area. These 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 West Radial Area Study are presented on **pages 23-24.**

Challenges and Opportunities

The following pages describe the key current and future challenges highlighted in the Evidence Base which have formed the key goals for the Options Appraisal Report to meet.

This includes:

- Opportunities for **better rail services** to enhance strategic connectivity between centres in the South West Radial Area;
- Opportunities to **facilitate the sustainable growth of key International gateways** in the South West Radial Area;
- Opportunities to support implement seamless **Inter and Intra-Urban connectivity** within and between Major Economic Hubs in the South West Radial Area; and
- **Highway** opportunities to strengthen resilience and accommodate freight movements in the South West Radial Area.

Current Challenges and Opportunities

Inter-urban rail Opportunities

The South West Mainline forms the railway spine of the South West Radial Area. It provides a crucial strategic link connecting the South Hampshire conurbation with the rest of the TfSE area, London and beyond. Furthermore, it is a nationally significant rail freight link, connecting the Port of Southampton to the rest of the country.

The majority of the South West Radial area is part of Network Rail's 'Wessex route', which hosts over 230 million passenger journeys each year, 100 million of which travel to or from London Waterloo.

Network Rail are committed to developing the route in the coming years and support a range of schemes, both minor and major, intended to improve the route's efficiency and capacity. Major schemes notably include the Woking and Basingstoke area enhancement schemes and Crossrail 2, which will unlock greater capacity on the South West Main line and allow more frequent and reliable services between London and key locations such as Southampton and Portsmouth.

In addition to this, Network Rail is investing over £2 billion into railway infrastructure across the South West area, which will be invested into a range of locations including rail freight which will see £18m investment in a freight train lengthening scheme in Southampton.

The Portsmouth Direct Line branches from the South West Main line and provides a direct link from Woking to Portsmouth. However, as illustrated in **Figure 3.1**, journey times are slower than other radial routes out of London due to services calling at intermediate stations. Interventions are being proposed to increase the capacity and provide better segregation between local and regional services.

Other rail opportunities lie to the North East of the area, where there are two new heavy-rail links in the works to connect with Heathrow. The Great Western Mainline links London to Reading and Newbury and onto the West Country. This line has experienced recent upgrade works and will continue to evolve should the Western Rail link to Heathrow be built. The Southern Rail link will allow travelers along the SWML a new route to Heathrow.

Ambition

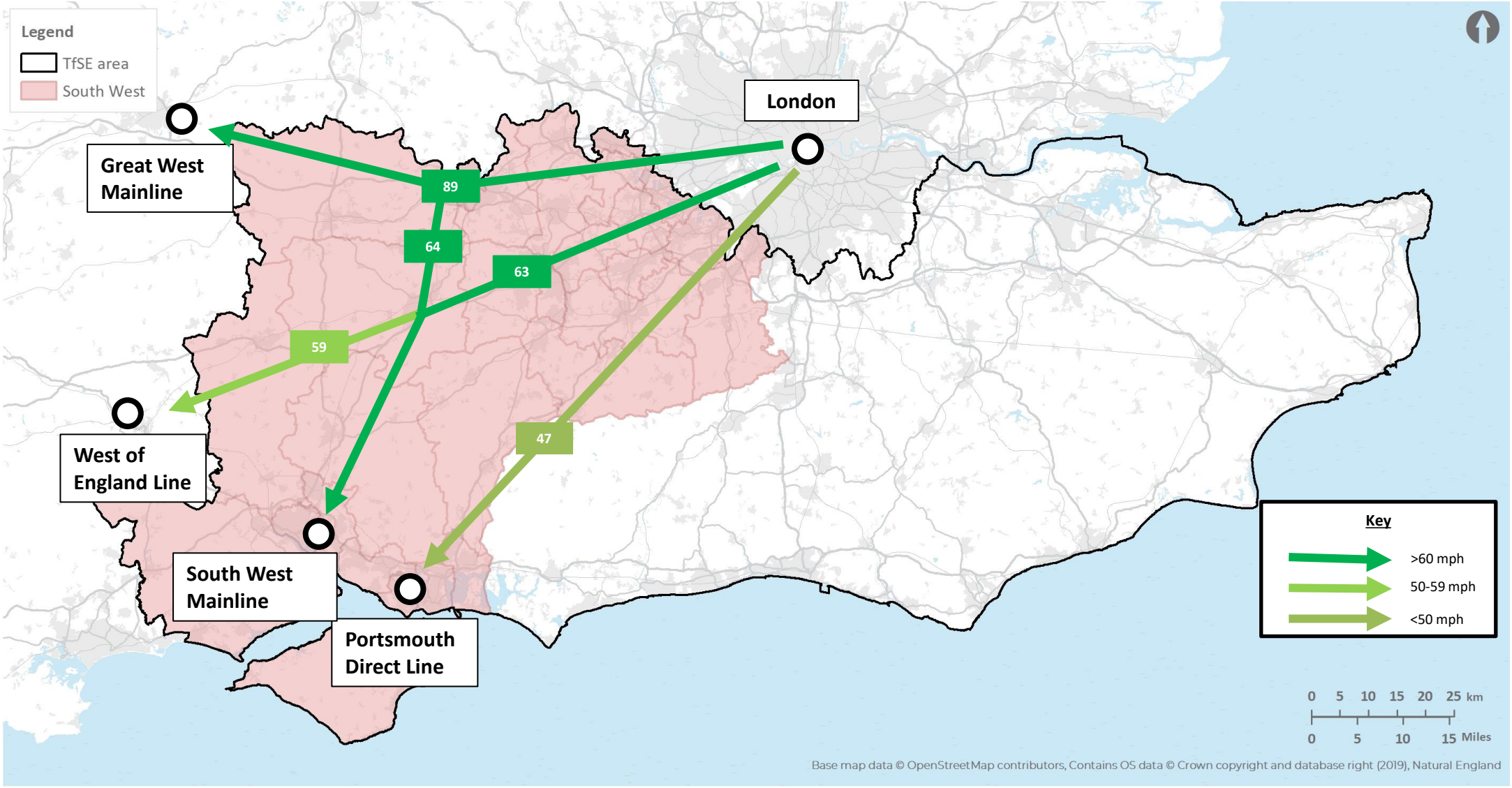
The Area Study Working Group aspires to see planned improvements delivered along the major railway lines in the area, offering a fast, frequent and reliable service for travellers between Major economic hubs.

They also wish to realise a higher utilisation of rail freight as a mode for onward connectivity from Southampton Port, and sees it to be crucial objective in achieving net-zero carbon.

Lastly, there is an ambition to maintain strong rail links to London and enhance rail connectivity to outside the area, via increasing the frequency of Cross-country services to the Midlands and services along the Test Valley line to Salisbury and South West England.

It is therefore a key goal of this study to enable Network Rail and operators deliver faster, more frequent interurban and intraurban rail services between and within the largest conurbations in the South West Radial area and the rest of the country and unlock rail freight paths.

Figure 3.1: Average speed of rail journeys along rail corridors in the South West Radial Area



Current Challenges and Opportunities

International Gateway Opportunities

Southampton Port is the 5th most significant UK port in terms of tonnage handled and is planning for significant growth (up to 1 million tones more per annum) between now and 2050.

Highways schemes, such as upgrades to relevant junctions along the M27, M3, A3 and A34, will unlock additional freight capacity on the roads and ensure reliable freight movements away from the port, increasing the competitiveness of the Solent Ports and supporting the ambition the wider Solent Freeport initiative which aims to continue expansion and support 26,000 new jobs in the area.

However, to meet national long-term decarbonisation targets, there is a need to ensure as much freight is transported onward via electrified rail freight.

Additionally, road freight congests many of the strategic highways in the area, and a shift to rail freight will relieve congestion on the road network and allow goods to be transported more efficiently.

There is a need to unlock additional rail freight paths on the South West Main Line, Basingstoke to Reading line and north through Oxford to allow freight to be reliably transported from Southampton Port to key freight hubs in the Midlands and new markets in the East and North East.

There are also opportunities to increase rail freight between Southampton Port and South West England and Wales by upgrading strategic sections of railway as depicted in **Figure 3.2.**

A key priority of this study is to support the growth of Southampton Port and unlock capacity on the rail network to accommodate a modal shift to rail.

Discussions are also underway to introduce new heavy rail links to London Heathrow as part of the Western and Southern Access to Heathrow Scheme, which will provide the South West Radial Area better access to one of the worlds busiest and well-connected airports.

A key goal of this study is to enable sustainable access to Heathrow Airport and make the area attractive for international investment.

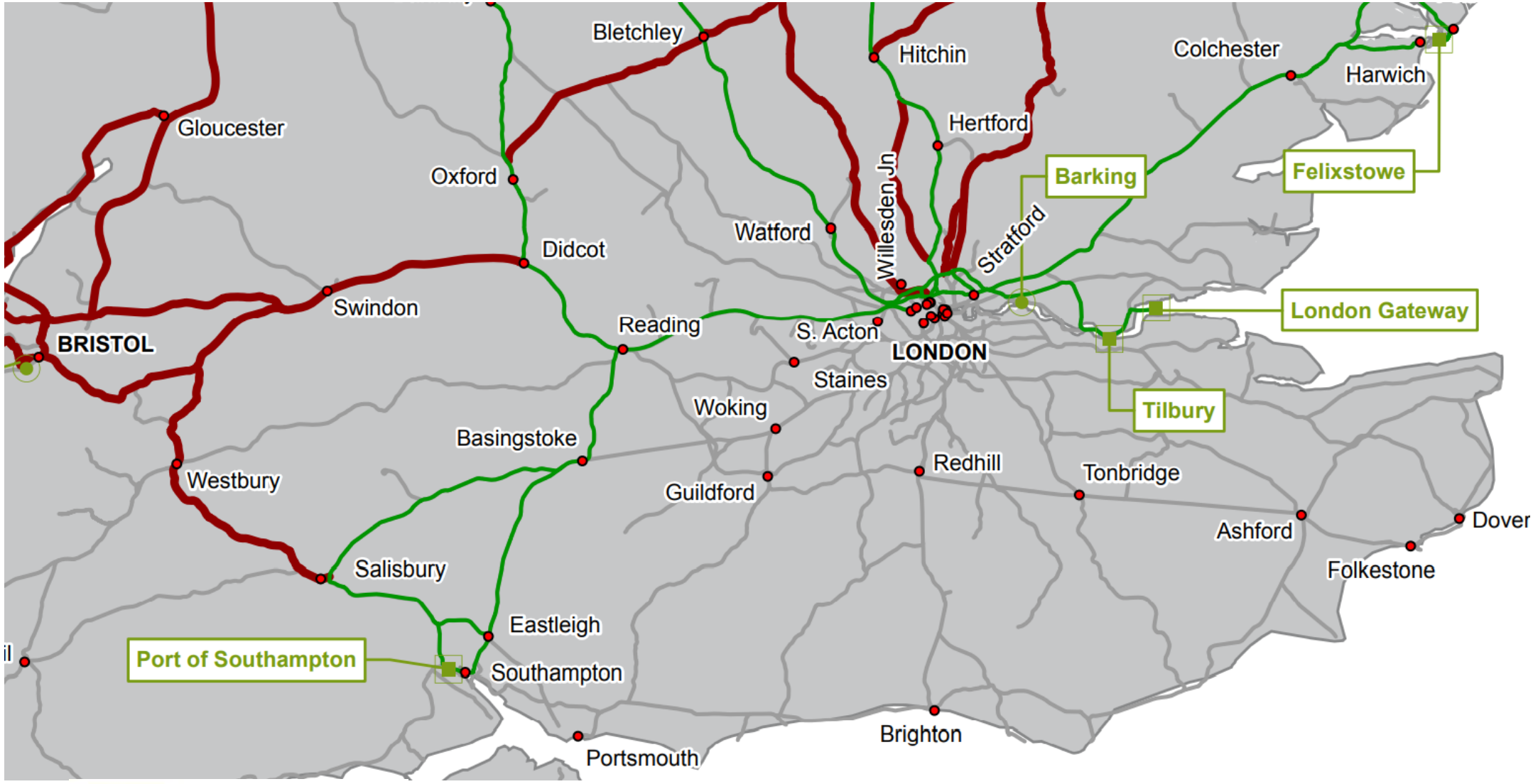
Solent Connectivity Opportunities

There is strong ambition to improve passenger connectivity between the Isle of Wight and the Mainland. In addition to providing a world class, frequent, reliable and affordable ferry service; there is a need for strong, sustainable Mass Transit connectivity to Southampton Port and Portsmouth Harbour, seamlessly integrating Isle of Wight Ferry services with rail and mass transit on the mainland.

Furthermore, there is a need to ensure effective integration with the transport network on the Isle of Wight. The project team identify the Isle of Wight as a potential exemplar for Public Transport given its size and unique characteristic of not being connected to the national road network. There is opportunity to make the most of existing infrastructure by reinstating disused railways and complementing rail with a bus-based Mass Rapid Transit system connecting key destinations across the Island including ferry terminals and tourism hotspots.

A key goal of this study is facilitate better connectivity to and within the Isle of Wight.

Figure 3.2: Opportunities for upgrading strategic Rail Freight corridors ins the South West Radial Area



A W10 Gauge is required to transport ISO standardized containers. Hence, there is a need to upgrade key sections of railway such as between Salisbury, Westbury and Bristol for these flows to accommodate rail freight.

For sections that are to W10 Gauge standard, there is a desire to increase the number of paths dedicated to rail freight services to ensure a higher volume of rail freight can be carried to key destinations in the Midlands and North of England.

Source: Freight Network Study (2017, Network Rail)
https://www.networkrail.co.uk/wp-content/uploads/2017/04/Freight-Network-Study-April-2017.pdf

Current Challenges and Opportunities

Inter and Intra-Urban Mobility Opportunities

The Area is home to several conurbations which are large enough to support world class mass transit systems. However, current provision is below the quality of offer provided in other regional conurbations.

Short distances between centres present an opportunity for bus based Mass Rapid Transit serving both intra-urban flows within the major economic hubs and inter-urban flows connecting adjacent hubs, improving connectivity and relieving road congestion.

Supporting this, there is an opportunity to create extensive, useful walking and cycling networks or private car alternatives which serve the requirements of local residents. Utilising the Transforming Cities Fund (TCF) should facilitate their development.

It is therefore a key goal of this study to enable Local Transport Authorities and partnerships in the South West Radial Area to deliver world class, mass transit and active travel systems in their largest urban areas.

Highway Opportunities

Local Transport Authorities and Highways England are developing interventions to build on existing good connectivity along the M3, A3, M4 and the A34 strategic highway corridors and support freight growth.

The M3 connects London and the M25 with Woking, Blackwater Valley Basingstoke, Winchester, and Southampton.

The A3 connects London to Portsmouth via Guildford. The A3 provides relatively high capacity along its route with Guildford being a particular pinch point where the 3 lane dualled road goes down to a 2 lane dualled road. Additionally, the A3 is used by local traffic to navigate Guildford as well as through traffic on the A3 often causing congestion.

The M4 connects London with Slough/Windsor, Maidenhead, Reading and Newbury/Thatcham and the A34 connect Oxford to Newbury, Winchester and Southampton.

However, as Figure 3.3 shows, there are several congestion hotspots on strategic and major road network.

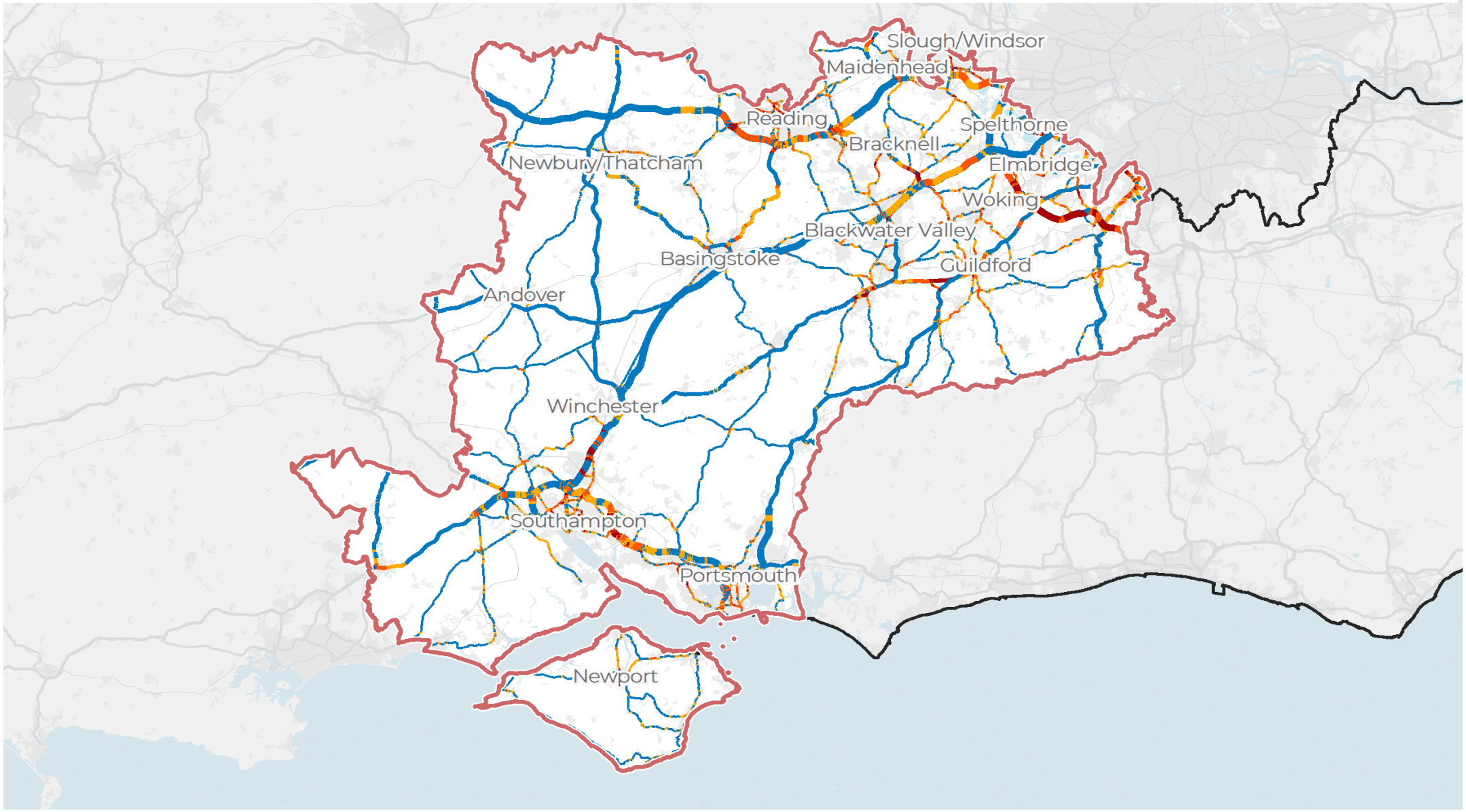
Ambition

Stakeholders in this area desired solutions which made the most of the existing infrastructure.

This included providing resilience on strategic links and supporting freight. This also included re-envisaging the role of A roads on the approach to Major Economic Hubs, implementing multi-modal solutions where possible to deliver a better strategic highway between Major Economic Hubs.

Key stakeholders in this area with to see long term multi modal solutions that utilise the existing strategic highway network, embrace new mobility innovations and strengthen connectivity with international gateways.

Figure 3.3: Highway Network and Congestion in the South West Radial Area



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

Future Challenges and Opportunities

Housing

The South West Radial Area is expected to accommodate significant housing growth in the next local plan period (up to 2025).

Future housing growth is expected to be concentrated around: Guildford, Woking and the Blackwater Valley; in the Reading to Basingstoke area; Southampton; and Newport. Much of this growth will occur in peri-urban settings, so it will be critical that developments are supported with active travel and public transport connections. Doing so will ensure that individuals can travel sustainably to work and residence without relying on private transport.

Employment

Employment growth is expected to be more concentrated in a few areas, particularly Brighton and the South Coast and the northern end of the area (urban periphery).

It is important to provide good public and active transport connections from these peripheral locations to urban centres and transport hubs. This will ensure these major economic hubs enjoy economic prosperity and an increased quality of life for all residents.

Risk of Imbalance

There is a risk of imbalance between housing and employment locations that may give rise to unsustainable outcomes.

There is a risk that concentrating housing developments in more rural areas, while employment is based within the urban area, may generate more demand by private vehicle. While housing is imperative, and to ensure housing that is both affordable and accessible is built, given the physical and environmental constraints of the area, some areas will be better placed to absorb housing than others.

COVID-19

COVID-19 has significantly altered established working patterns – but the long-term impact is not yet clear.

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. This will ensure these cities enjoy economic prosperity and improved quality of life.

Need for Intervention

If no plans are made to address the issues in the South West Radial Area, then many of the socioeconomic challenges will likely persist.

The current pipeline of highway and rail schemes being delivered through the Road Investment Scheme (RIS) and rail investment programmes should help address short-term capacity and connectivity charges.

However, in the longer term, the focus should shift away from adding highway capacity (planning for vehicles') and instead focus on investing in public transport services (planning for people) and promoting policies such as integrated land use and transport planning ('planning for places').

The South West Radial Area Study will need to provide a framework for managing the future challenges and leveraging the future opportunities summarised here. The following four pages present the Vision, Objectives, and Problem Statements for the South West Radial Area.

Vision

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 West 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 door-to-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 West Vision Statement

The South West Radial area will develop a decarbonised, prosperous, and outward-facing economy to provide opportunities for its residents, businesses, and its visitors to thrive.

The communities of the South West Radial area will be planned to provide affordable housing for all, linked in to an integrated, accessible and comprehensive public transport network, promoting sustainable travel outcomes.

The South West Radial area's role as the key route for international freight to the Midlands and North will continue to grow, resilient to a changing relationship with the EU.
Growing towns and cities, high growth, high value industries, international gateways and sustainable transport connections to the rest of the UK will be leveraged to deliver carbon neutrality, sustainable economic growth and improved opportunities for residents.

Objectives

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

Climate Change

Minimise disruption from climate change and move to net zero carbon by:

- Reducing the need to travel;
- Enabling and growing active travel;
- Shifting passenger and freight travel from fossil fuel traction to zero emission traction;
- Improving transport network energy efficiency; and
- Improving transport network resilience to climate events.

Natural and Historic Environment

Protect and enhance the natural and historic environment by:

- Adopting the principles of biodiversity net gain / no-net loss;
- Avoiding interventions that adversely impact protected environments;
- Reducing the impact of transport operations on protected and historic environments; and
- Improving public and active mode transport to protected environments.

Cross boundary interaction

Maintain and strengthen economic and social relationships with locations outside of the Transport for the South East area by:

- Working with neighbouring sub-national transport bodies to enable sustainable cross boundary connectivity between major economic hubs;
- Improving access between the area's international gateways and the rest of the UK; and
- Strengthen resilience of transport corridors serving freight markets

Economy

Reduce poverty and boost prosperity for all residents by:

- Attracting investment in high growth, high value opportunities;
- Boosting productivity through better skills matching, knowledge sharing and agglomeration;
- Reducing costs for businesses; and
- Improving transport network resilience.

Society

Enable the "levelling up" of socioeconomic outcomes by:

- Enabling residents to access affordable housing, employment opportunities and essential services;
- Improving access for all members of society, especially individuals with reduced mobility; and
- Enabling deprived communities to attract investment and achieve more equitable socioeconomic outcomes.

Freight

Support sustainable and efficient movement of goods through the region, to and from the wider UK by:

- Improving freight connectivity through sustainable modes, including electric rail freight; and
- Balancing the needs of passenger and freight demand.

Problem Statements

The following problem statements were identified as key issues to address in this area:

Global issues

1. Transport is not decarbonising fast enough
2. Climate change threatens the resilience of transport networks
3. Parts of the South West Radial area have poor socioeconomic outcomes
4. There is a significant need for more housing – but it needs to be sustainably delivered
5. Demand for public transport has been negatively affected by COVID-19

Urban and inter-urban transport

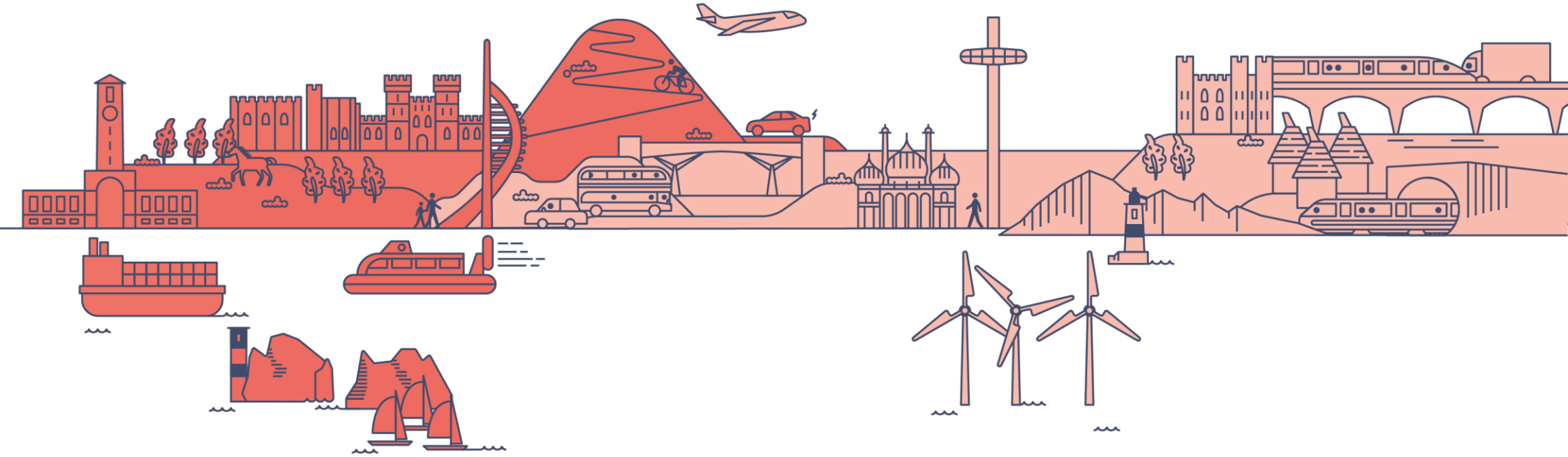
6. In too many areas bus services do not provide a competitive sustainable alternative to cars
7. In parts of the area public transport does not adequately provide for strategic local trips
8. Connectivity out of the region is often poor via sustainable modes
9. Highway congestion limits public transport connectivity on the Isle of Wight
10. Ferry services on the Isle of Wight do not facilitate the same level of access to services as the mainland
11. Ferry fares are high and do not provide enough accessibility to and from the Isle of Wight
12. Highway congestion constrains access to Solent Ports
13. Radial highway corridors close to the M25 South West Quadrant experience considerable congestion

Active Travel

14. Active travel mode share is low for short journeys in the region

Rail

15. Infrastructure could be upgraded to allow more freight to be carried by rail
16. Portsmouth to London by rail is slower than most radial services in the wider South East area
17. The Inner South West Mainline between Woking and London is particularly capacity constrained
18. There are opportunities to improve rail connectivity between major economic hubs
19. There are opportunities to improve radial rail connectivity to London Heathrow



Part 4

Long List Generation and Assessment

Overview

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 West 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 West Radial Area Study was developed in line with DfT's WebTAG guidance and Early Assessment and Sifting Tool (EAST).

WebTAG describes 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 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 of Generation and Typology Categorisation

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 West Radial 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, 98 interventions and options were included in the Long List. These covered a wide range of topics including active travel, rail infrastructure, ferry operations, highway improvements, freight and port expansion interventions.

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
- Battery-powered Rolling Stock
- Freight
- Highways (offline infrastructure)
- Highways (online infrastructure)
- Highways (Smart Motorways)
- Integrated Public Transport
- Mass Rapid Transit (MRT) – Level 1 (Provision of direct bus services of at least 4bph)
- Mass Rapid Transit (MRT) – Level 2
- (Bus service enhancement and implementation of infrastructure priority measures)
- Passenger ferry operations
- Ports
- Rail Infrastructure (new)
- Rail Infrastructure (operations)

Long List Assessment

Once the long list is completed, an assessment of the proposed interventions could be undertaken.

A Multi-Criteria Analysis 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 well against an agreed set of criteria to produce a 'short-list' 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**, based on a set of criteria developed during the production of TfSE's Transport Strategy.

The following pages describe each assessment in more detail.

Strategic Assessment (1 of 3)

Strategic Assessment Typology Scores

The Strategic Case Assessment tests the extent to which each intervention fits with the South West Radial'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, Integrated Public Transport does not perform as well under the Climate criteria as Active Travel but does perform better than Smart Motorways.

Table 4.1: Typology Strategic Assessment

Typology	Objectives					
	Climate	Freight	Cross boundary interaction	Econ.	Soc.	Env.
Active Travel	4	1	1	3	4	5
Ferry operations	2	4	2	3	3	3
Freight	2	4	2	4	2	3
Ports	1	4	4	4	2	1
Highways (online infrastructure)	1	3	3	2	2	1
Highways (offline infrastructure)	1	3	3	2	2	1
Integrated Public Transport	3	1	3	3	4	4
BRT (level 1)	3	1	1	3	3	3
BRT (level 2)	3	1	1	3	3	3
Rail infrastructure (new)	3	3	3	3	3	1
Rail infrastructure (operations)	3	3	3	3	3	3
Smart Motorways	2	3	2	3	2	1
Ferry operations (passenger ferry)	2	2	2	3	3	3
Battery-powered Rolling Stock	4	1	1	1	1	4

Strategic Assessment (2 of 3)

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), they are some important differences between them. For example, a new highways 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 applied 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 delivers any of the impacts listed below	Objectives					
	Climate	Freight	Cross boundary interaction	Econ.	Soc.	Env.
Permanently undermines protected areas						-1
Temporarily undermines protected area						-1
Enhances access to international gateways			+1	+1		
Enhances placemaking	+1					+1
Undermines placemaking				-1	-1	
Supports housing development				+1	+1	
Enhances national connectivity			+1	+1		
Enhances freight connectivity and resilience		+1		+1		
Delivers other climate change benefits	+1					

Worked Example

A 'generic' **Smart Motorways** intervention would initially be assigned the following:

Typology	Objectives					
	Climate	Freight	Cross boundary interaction	Econ.	Soc.	Env.
Smart Motorways	2	3	2	3	2	1

However, if the Smart Motorways supported housing development, its score would be:

Typology	Objectives					
	Climate	Freight	Cross boundary interaction	Econ.	Soc.	Env.
Smart Motorways	2	3	2	4	3	1

Strategic Assessment (3 of 3)

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 South West 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 example of the results for policy alignment scores.

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.

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 many cases there was significant variation between national, regional, and local policy alignment.

Table 4.3: Excerpt of Policy Alignment Scores

Intervention	Options	Policy Alignment		
		National	Local	TfSE
Crossrail 2	Preferred option	4	1	4
Portsmouth line upgrades	Digital Railway	2	2	4
	Line speed infrastructure improvements	2	2	4
	Increase line speeds through tunnel	2	2	4
	Faster, direct services between Portsmouth and London	2	2	4
	Improved local service between intermediate centres along Portsmouth Direct Line	2	2	4
A3 Guildford upgrades	A3 Online enhancements	2	1	4
	New Guildford bypass	2	1	4
	New Guildford tunnel	2	1	4
	Local interventions within Guildford to segregate local and strategic traffic and encourage a shift to other modes for local journeys	2	1	4

Economic Assessment (1 of 3)

Economic Assessment

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

In contrast to the Strategic Assessment, the Economic Assessment uses a three-point Red-Amber-Green (RAG) score system (including also a no impact category).

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.

No negative scores were assigned, instead Red (1) means no/low impact.

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 results of this assessment.

Economic Assessment (2 of 3)

Table 4.4: Typology Economic Assessment

Typology	Economic Growth					Carbon			Local Environment				Health and Wellbeing					
	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
Ferry operations	3	1	3	3	3	1	1	3	3	3	3	3	5	3	3	5	3	3
Freight	5	3	3	1	3	5	3	3	3	3	3	3	3	1	5	3	3	1
Port	3	3	3	1	5	5	3	3	3	3	3	3	3	1	3	1	3	3
Highways (online infrastructure)	3	5	3	3	5	1	3	3	3	1	3	3	3	1	3	1	1	1
Highways (offline infrastructure)	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
BRT (level 1)	3	3	3	3	5	3	3	5	3	3	3	3	5	5	3	5	5	3
BRT (level 2)	4	4	3	3	5	3	3	3	3	3	3	3	5	5	3	5	5	3
Rail infrastructure (new)	5	5	5	5	5	5	3	1	5	3	3	3	3	3	3	5	5	5
Rail infrastructure (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	5	1	3	3	3	3
Ferry operations (passenger ferry)	3	1	3	3	3	1	1	3	3	3	3	3	5	3	3	5	3	3
Battery-powered Rolling Stock	1	1	1	1	5	5	5	5	5	3	5	3	3	3	3	3	3	3

Economic Assessment (3 of 3)

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 the adjustments presented below are either +2 or -2.

Figure 4.5: Economic Assessment Adjustment Factors

Typology	Economic Growth					Carbon			Local Environment				Health and Wellbeing					
	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													
Enhances placemaking																		
Undermines placemaking												-1	-1	-1	-1	-1	-1	
Supports housing development				+2														
Enhances national connectivity	+2																	
Enhances freight connectivity and resilience	+1		+1															
Delivers other climate change benefits						+2	+2											

Deliverability Assessment (1 of 3)

Deliverability Typology Scores

The Deliverability Assessment is based on a set of criteria defined by TfSE in developing its Transport Strategy.

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 and 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

Typology	Objectives						
	Capital Cost	Value for Money	Affordability	Timescale	Technical Risk	Acceptability	Evidence Base
Active Travel	5	5	4	5	4	5	4
Ferry operations	4	3	3	5	4	3	3
Freight	3	4	2	3	2	4	3
Port	3	3	2	3	3	3	3
Highways (online infrastructure)	3	3	4	4	4	3	3
Highways (offline infrastructure)	3	3	4	3	4	3	3
Integrated Public Transport	5	4	4	3	4	4	3
BRT (level 1)	5	3	4	5	5	4	4
BRT (level 2)	4	3	4	4	4	4	4
Rail infrastructure (new)	2	2	3	2	2	4	2
Rail infrastructure (operations)	3	4	4	4	4	5	3
Smart Motorways	3	4	4	5	3	4	3
Ferry operations (passenger ferry)	5	3	3	5	4	3	3
Battery-powered Rolling Stock	3	3	4	4	2	4	2

Deliverability Assessment (2 of 3)

Approach to Deliverability Assessment

Given the range of criteria used for the Deliverability Assessment, the scoring system required a different approach for each criteria.

Capital Costs

Capital cost has been assessed based upon known infrastructure banding as follows:

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

Value for Money

In order to assess at a high-level the potential Value for Money of interventions, a decreasing magnitude scoring approach has been applied. Those projects which would cost significant amounts of funding (such as Nationally Significant Infrastructure Projects) score lower than those with smaller budgets.

Affordability

Affordability was assessed against the likelihood that funding can be provided. It considers 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 has been assessed and scored based upon existing, comparable schemes and whether it is likely to be 'more' or 'less' complex than other schemes in that typology. '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 Assessment (3 of 3)

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 base-score assigned. For example, a rail tunnel scheme is more likely to have a higher cost overall than rail line improvements.

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

Typology	Objectives						
	Capital Cost	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				+2			
Timescale: Long Timescale				-2			
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

Assurance and Moderation

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 West 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 policy alignment scores. 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/developing policy.

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

Park or Proceed Decision

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

In general, interventions were parked if they receive score of 2/5 or less for:

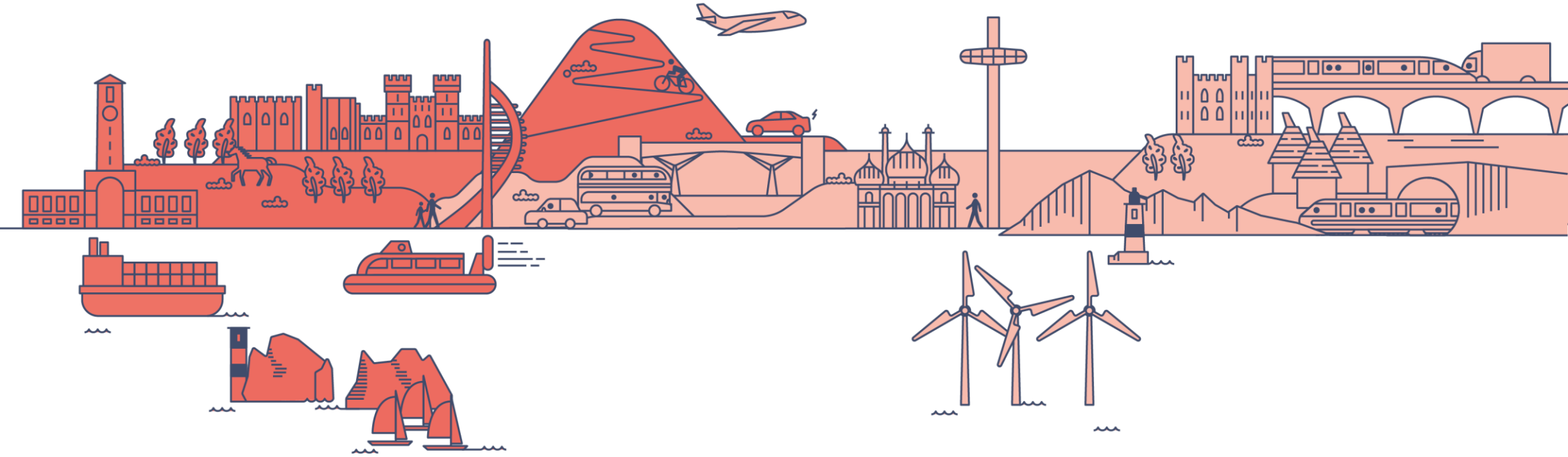
- **Policy alignment** (any score)
- **Strategic Sift** (average score)
- **Economic Sift** (average score)

Interventions with a **Delivery Sift** average score of 2/5 or less were not automatically ruled out at this stage.

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)'.

The results of the Long List Assessment are provided in the following Part. This Part also describes how the best performing interventions were combined to create 'Packages' of interventions.



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 West 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 West 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.

Figure 5.1: Approach to Package development

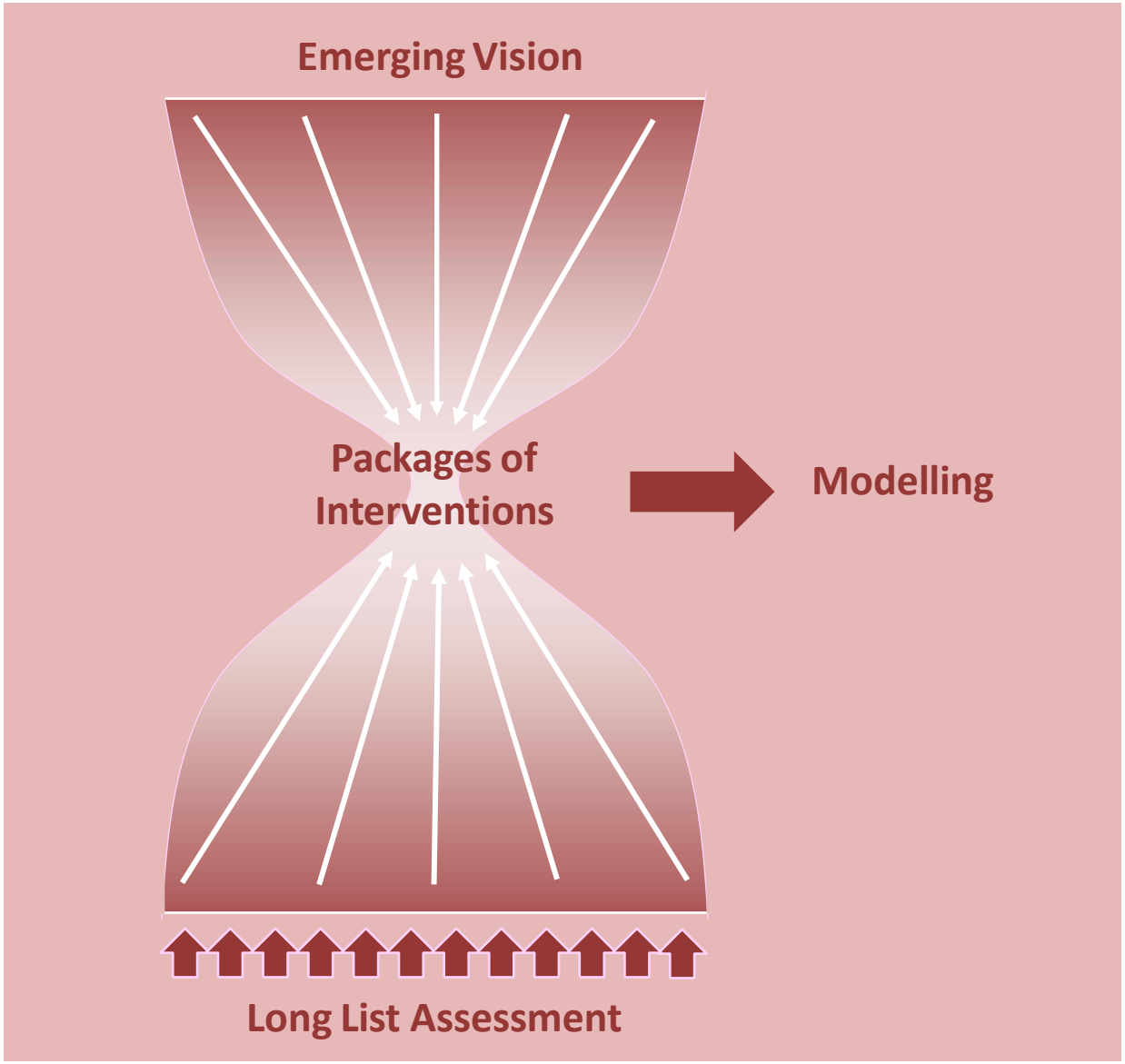
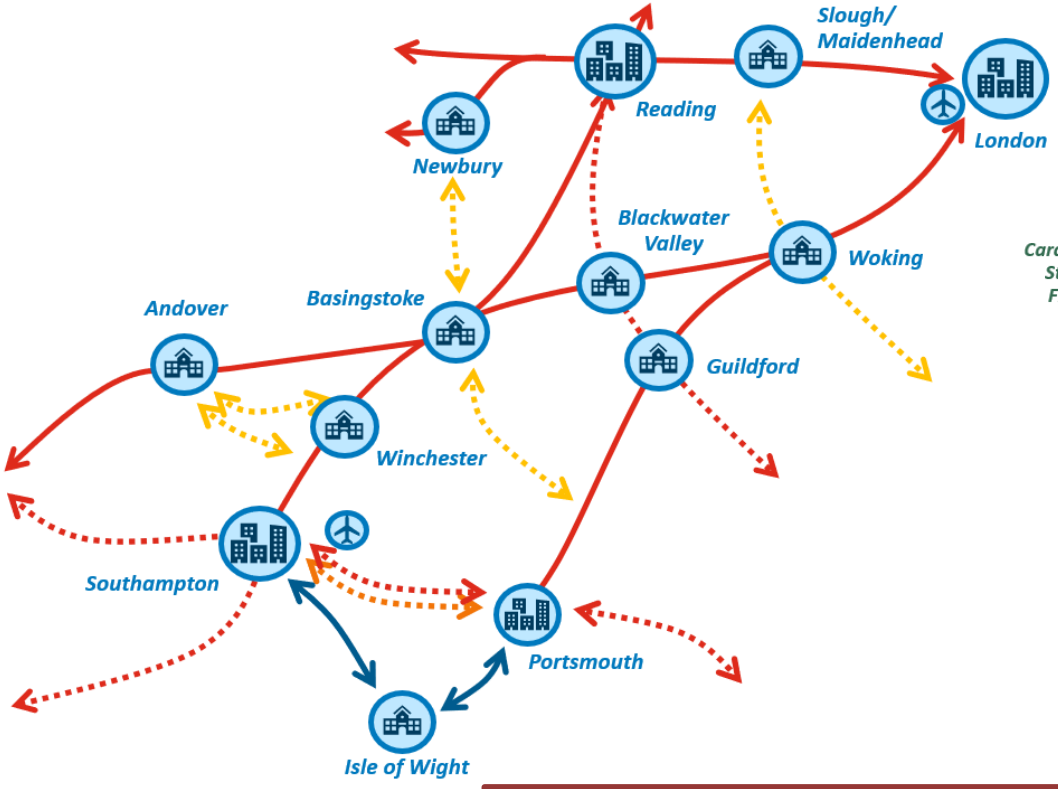
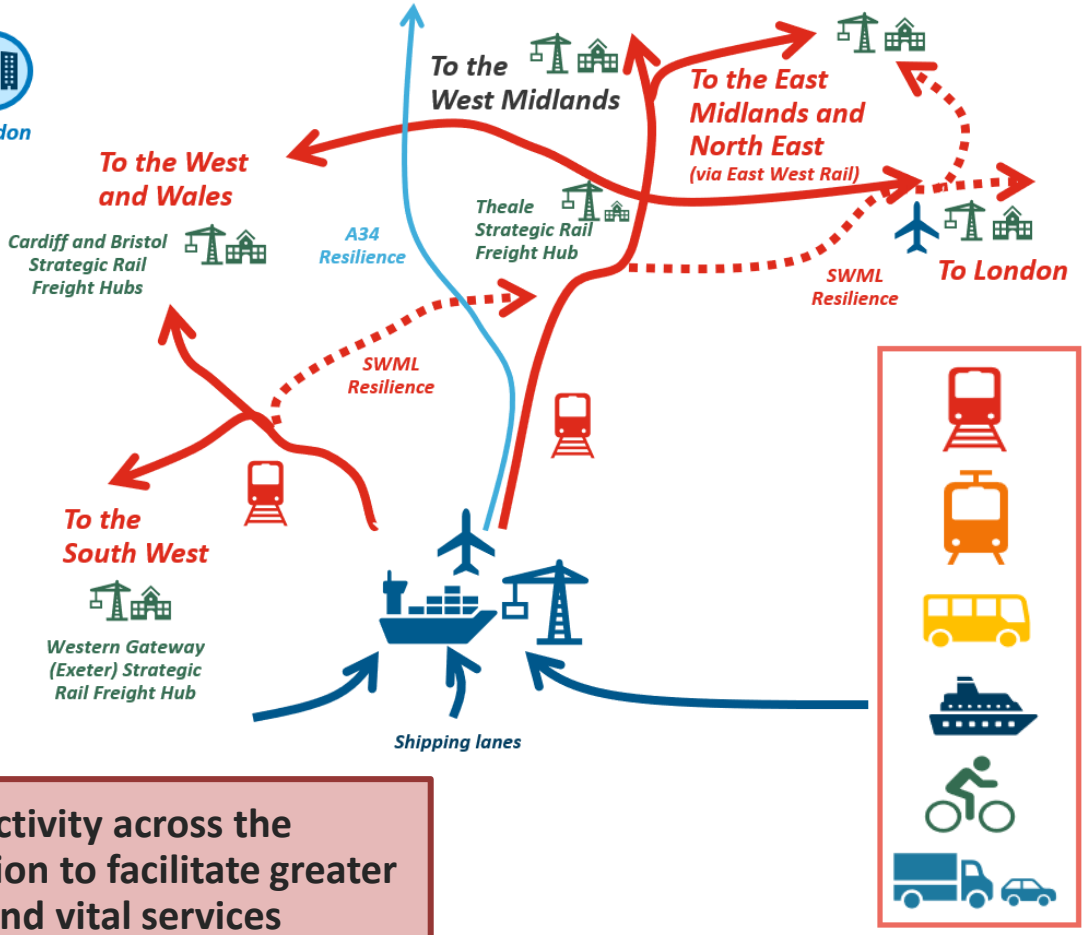


Figure 5.2: Vision for the South West Radial Area's transport system

1 Fast, responsive and reliable strategic transport network facilitating sustainable movement within and between major economic hubs

3 An efficient and resilient freight network to support growing demand from the Solent Ports and stimulate a successful economy



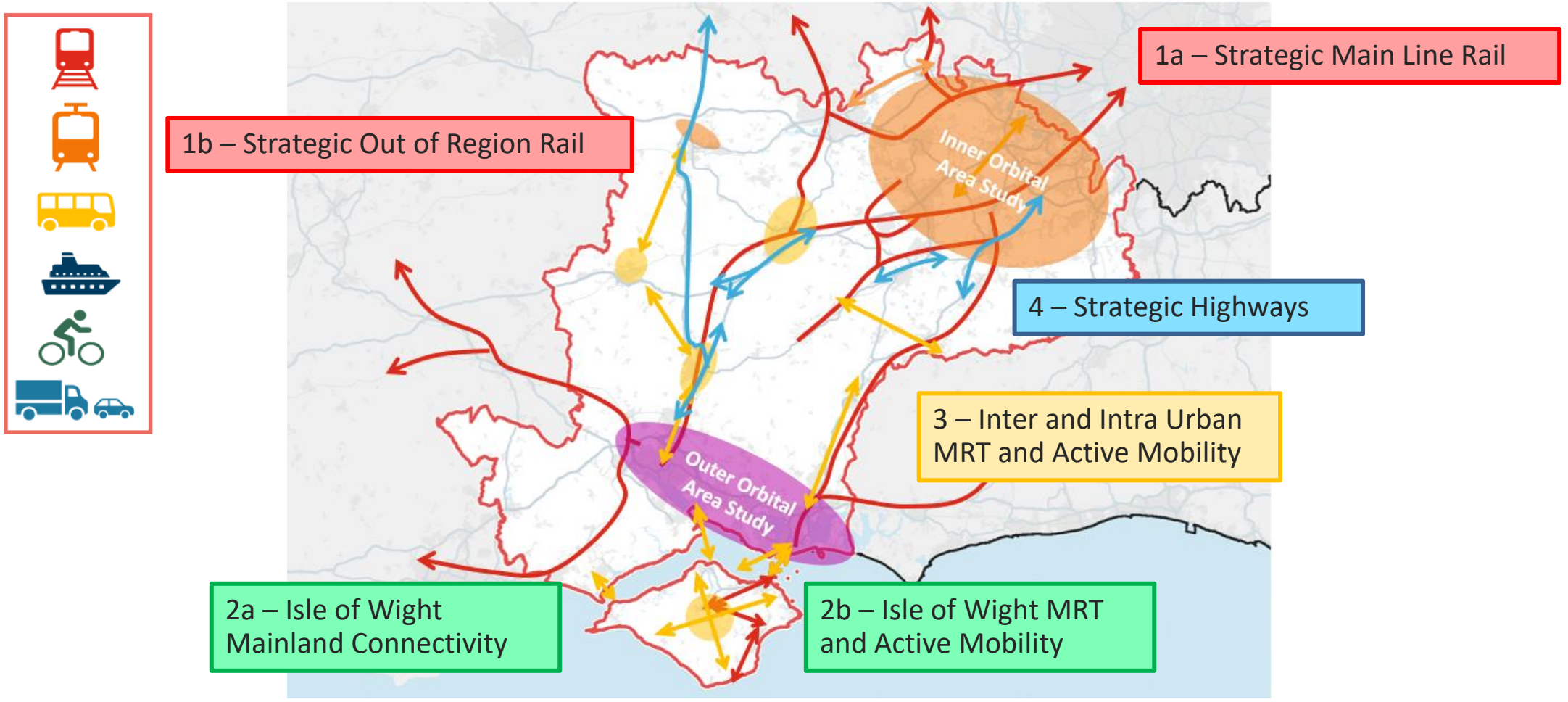


2 Levelling up of connectivity across the whole Solent sub-region to facilitate greater access to jobs, skills and vital services

Key Elements in the Vision

To deliver the vision outlined in the previous page, the South West 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.

Figure 5.3: Key elements supporting the South West Radial Area Study vision



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 West Radial area. They present the results of the MCAF assessment and list the interventions recommended for further appraisal.

Packages and Options Assessments Results (1 of 9)

Railway Interventions

The South West Mainline forms the railway spine of the South West Radial Area.

Local stakeholders across the South West Radial area, with the support of Network Rail, are coming together to promote major rail schemes that aim to overcome known capacity constraints, increase the number of paths along the main lines, increase reliability and deliver improvements to rail journey times across the area.

The Multi Criteria Assessment indicates that all South West Main Line Infrastructure upgrades and service enhancements score well and will be explored in further modelling.

Table 5.1: Rail Interventions Options Assessment Results (1 of 4)

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Woking Enhancement Scheme (Woking flyover)	Preferred Option	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Basingstoke Enhancement Scheme	Basingstoke Flyover	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Basingstoke passing loops to North of station	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	
	Micheldever terminating platforms	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	
SWML upgrades - Woking and London	Woking station improvements	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	Proceed
	Clapham Junction - Vauxhall capacity increase	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Clapham Junction - stopping SWML fast services	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Digital Railway	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
SWML upgrades - South of Woking	Improved local service between intermediate centres along SWML	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	Proceed
	New station to South of Basingstoke/Turnback facility at Micheldever	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	✓✓	Proceed
								Proceed
	Digital Railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	
SWML - Eastleigh to Southampton	Digital Railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed

Key to ticks

- ✓✓✓✓ Very high alignment (Scores above 4.4)
- ✓✓✓ High alignment (Scores between 3.5 – 4.4)
- ✓✓ Medium alignment (Scores between 2.5 – 3.4)
- ✓ Low alignment (Scores between 1.5 – 2.4)
- ✕ Works against objective (Scores less than 1.5)

Packages and Options Assessments Results (2 of 9)

Railway Interventions

The South West Radial Area is the gateway for the wider TfSE area to the rest of Great Britain.

There is a strong desire to improve rail connectivity between South Hampshire and other large conurbations in the Midlands such as Birmingham and Oxford via faster, more frequent CrossCountry services and better connectivity to Bristol, the South West and Wales via delivering faster and more frequent services along the Test Valley line.

Furthermore, there are aspirations to provide faster services between Portsmouth to London and Bracknell to London.

The Multi Criteria Assessment scores these service enhancements well and options to meet these desires will be explored in further modelling. On the other hand, the introduction of battery trains in the Test Valley will be parked due to performing poorly against local policy alignment and strategic objectives.

Table 5.2: Rail Interventions Options Assessment Results (2 of 4)

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Portsmouth line upgrades	Digital Railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Line speed infrastructure improvements	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Increase line speeds through Buriton Tunnel	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Faster, direct services between Portsmouth and London	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Improved local service between intermediate centres along Portsmouth Direct Line	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	Proceed
CrossCountry and out of region service improvements	Resume CrossCountry services to Portsmouth (from the Midlands)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Increase CrossCountry services to Southampton (from the Midlands)							Proceed
Reading, Bracknell to London faster services	Passing loops	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Digital Railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Test Valley line: Southampton - Romsey - Salisbury upgrades	Electrification	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Battery trains enabling fast, frequent local services to Romsey and Salisbury	✓✓	✓✓✓	✓✓	✓✓	✓	✓✓	Park
	Provide resilience for SWML	✓✓✓	✓✓✓	✓✓✓✓	✓✓	✓✓✓	✓✓	Proceed
	Passing loops for passenger and freight resilience							Proceed
	Digital Railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Timetable optimisation	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Increase long-distance services between South Hampshire and South West England/Wales	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed

Packages and Options Assessments Results (3 of 9)

Railway Interventions

A number of supporting interventions are required to deliver the vision for rail in this area. Of the issues identified along the South West Main Line, capacity between Woking and London was emphasised as a key constraint. Crossrail 2 aims to unlock capacity on the main line for longer distance services, whilst simultaneously transforming the service of districts on the fringes of London and the TfSE area including Runneymede and Elmbridge. TfSE are in support of the scheme, however as much of the core benefits will lie outside the TfSE area, it has not been modelled in this study.

Reinstating the Bourne End to Wycombe Railway performed poorly on deliverability and strategic objectives, hence has not been taken further in this study.

Stakeholders agree there is a high potential for transforming public transport provision on the Isle of Wight with Rail, MRT and active mobility. This will be taken forward as an integrated, multi-modal package. However, a fixed link to the mainland has been ruled out.

Table 5.3: Rail Interventions Options Assessment Results (3 of 4)

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Reading to Basingstoke rail line upgrades	Electrification	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Capacity enhancement	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	
	New stations to support development between Reading and Basingstoke	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	
Alternative rail power generation on SWML and wider rail network	Sustainable power options for passenger and freight services	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Crossrail 2	Preferred option	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Alternative options to increase local and regional service provision between Woking - London	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	Park – preference for full Crossrail 2
Bourne End to Wycombe Railway reopening	Reinstate rail infrastructure	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓	Park
IOW Restoring Railway Sandown-Newport	Restoring Railway Fund to open disused railway	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed – consider in IOW package
IOW Restoring Railway Ventnor-Shanklin	Identified opportunity to open another section of disused railway	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed – consider in IOW package
Passenger link to Southampton Port for IOW Ferry and Cruise terminal Direct link	Rail	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓	Proceed
	Tram	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed in OO MRT package
	Bus				✓✓	✓✓	✓✓✓	
IOW fixed link to mainland	New infrastructure Rail Tunnel/Bridge	✓✓	✓	✓✓✓	✓✓	✓	✓	Park
	New infrastructure Road Tunnel/Bridge	✓✓	✓	✓	✓✓	✓	✓	

Packages and Options Assessments Results (4 of 9)

Railway Interventions

Discussions with stakeholders and subject matter experts led the team to review the potential for demand responsive rail services to the South Coast, running in addition to a regular timetable if paths are available to accommodate large, ad-hoc leisure flows to major events, festivals, and cruise terminals. Additionally, there may be scope on the Portsmouth Direct line to run superfast service in peak hours when there is sufficient end-to-end demand between Portsmouth and London.

New stations to serve new and growing developments will be continued to be investigated further.

The Sturt Road Chord has not been taken further at this stage due to deliverability challenges, however, if sufficient capacity is unlocked on the SWML from interventions listed previously, there may be scope to run fast, direct services from Camberley to London. It was deemed the Alton line has a sufficient service and better connectivity with the North Downs line will deliver desired connectivity outcomes (to be taken forward in the Inner Orbital Study).

Table 5.4: Rail Interventions Options Assessment Results (4 of 4)

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Reextend services to Portsmouth Harbour	Reextend London Victoria - Chichester - Portsmouth Southern service to Portsmouth Harbour	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
Demand Responsive rail services leisure demand	Increased charter services for events – consider superfast direct services	✓✓	✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	Proceed
	Cruise ship integration charter services	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
Demand Responsive rail services peak superfast services	Consider potential routes e.g. Portsmouth London	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
IOW Improve existing railways	Increase service frequency to 4 trains per hour through a new passing loop between Brading and Sandown	✓✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
Guildford Merrow new rail station	New station to the East of Guildford – serve new development	✓✓✓	✓✓	✓✓	✓✓	✓✓✓	✓✓	Proceed
Guildford Park Barn new rail station	New station to the West of Guildford – serve hospital and university	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	Proceed
Sturt Lane Chord – Faster Camberley to London service via Ash Vale	Note that intervention will conflict with capacity on the main line – could provide opportunity if the SWML services are reconfigured	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	Park
Alton line upgrades		✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓	Park

Packages and Options Assessments Results (5 of 9)

Railway Freight

Southampton is the second busiest container port in the UK and there is substantial scope for shifting freight from road to rail.

The logistics and freight industry in the area is strong and provides considerable economic benefits to the area. The forthcoming Solent Freeport and enabling transport developments score high in terms of national policy alignment objectives and is expected to create considerable new jobs in the area.

It is worth noting upgrades to railway infrastructure on the South West Main line highlighted previously will unlock capacity for more passenger and freight services.

There is a strong strategic and environmental case for shifting more freight to rail if the government is to meet national decarbonisation targets.

All interventions listed will be taken forward in this study. The TfSE Freight Study will also look to provide a more compelling narrative for developing identified interventions.

Table 5.5: Rail Freight Interventions Options Assessment Results

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Upgrade rail freight access to and loading at Southampton Container Port		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Upgrade rail freight access to and loading at Southampton Existing Automotive Port		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
New access rail infrastructure to Port of Southampton Strategic Land Reserve		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Two to three permanent freight paths per hour from Southampton - Basingstoke - Reading - Oxford		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Resilience of rail freight to the Midlands	Upgrade diversionary route via Salisbury/ Westbury/ Melksham	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Freight routes via Hounslow Loop	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Rail freight to London	Freight paths on SWML to a new rail freight terminal in Outer London	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Unlock more rail freight paths via Salisbury and Trowbridge	Serve a rail freight terminus near Bristol or Wales	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Introduce regular rail freight to SW region	Serve a new Western Gateway rail freight terminus in Exeter	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Solent Freeport enabling transport improvements		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Rail freight interchange at Theale, South of Reading		✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
Local distribution/freight consolidation centres	Havant freight rail hub	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	Proceed
	Fratton freight rail hub	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	Proceed
	Other freight rail hubs	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	Proceed

Packages and Options Assessments Results (6 of 9)

Isle of Wight Ferry and Mass Rapid Transit Interventions

TfSE and the Area Study Working Group are developing a package of interventions aimed at focusing on connecting the Isle of Wight with the Mainland and improving connectivity within the Isle of Wight itself.

Stakeholders from the Isle of Wight and wider Solent region all raised the opportunities to transform ferry services, through increasing frequency of services, extending hours of operation, opening new routes and subsidizing ferry fares. Furthermore, to maximise this potential and ensure seamless integration, there is a need to ensure effective integration with the transport network on the Isle of Wight and on the mainland.

Ferry and Mass Rapid Transit Interventions for the Isle of Wight generally score highly across all objectives.

Table 5.6: Isle of Wight Options Assessment Results

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Portsmouth to Ryde Ferry	All day half hourly services (higher during peak hours)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Night ferry services	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Timed connection in both directions between the Ferry and train at Portsmouth Harbour	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Southampton to Cowes Ferry	Increase frequency of service during peak and off-peak and consider night running	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Improve connectivity between Southampton Ferry docks and Southampton Central	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
Southampton to Ryde Ferry	Reinstate direct service giving options for those living in the East of IOW to easily get to Southampton	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Cowes to Portsmouth Ferry	Reinstate direct service giving options for those living in North IOW to easily get to Portsmouth	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Mainland - IOW Ferry Increase frequency of service during peak and off-peak	All Mainland - IOW ferry routes	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Mainland - IOW Ferry Subsidised ferry fares	All Mainland - IOW ferry routes	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
IOW Ferries + Rail/MRT/Active Travel integration	Timetable integration	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	Ticket and Fare integration	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Increase sustainable connectivity between ferry and other modes	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
IOW repurpose disused railway for MRT/active travel		✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓	Proceed
IOW MRT	Bus frequency increase and new services	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓	Proceed

Packages and Options Assessments Results (7 of 9)

Inter- and Intra-urban Mass Rapid Transit Interventions

Local stakeholders are committed to providing an alternative to car use in urban centres across the area.

Mass transit options, which include increasing the frequency, operating hours, reliability and catchment of bus services, supported with bus priority infrastructure where appropriate, have been considered for Major Economic Hubs including Basingstoke, Winchester, Andover and Newbury. Furthermore, key radial corridors into Southampton from Eastleigh and Winchester and into Portsmouth from Havant and Waterlooville have been considered as options for Mass Transit.

The Multi Criteria Assessment indicates that the Intra and Inter-Urban Mass Rapid Transit Interventions perform well, particularly against the economic and delivery objectives.

It is important to note that other Major Economic Hubs in the area are being considered in the Inner and Outer Orbital Area Studies.

Table 5.7: Inter- and Intra-urban Mass Rapid Transit Options Assessment Results

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
Basingstoke MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Winchester MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Andover MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Winchester – Eastleigh – Southampton MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
A3 Portsmouth - Cosham - Waterlooville - Petersfield MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Alton - Bordon - Haslemere MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Andover - Newbury MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
Andover - Winchester MRT	Bus frequency increase and new services	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓✓	Proceed
	Infrastructure bus priority measures + bus service enhancements	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed

Packages and Options Assessments Results (8 of 9)

Inter- and Intra-urban Mobility Interventions

Local Transport Authorities in the South West Radial Area have ambitious plans to supplement MRT initiatives with measures to improve active travel and embrace new mobility initiatives such as e-bikes and e-scooters.

This study supports the creation of extensive walking and cycling networks that serve the requirements of local residents and connect key destinations within centres such as railway stations, schools, hospitals.

All of the active travel interventions score well, specifically in terms of delivery due to their low construction cost compared with other options and thus, will be explored in further modelling.

Table 5.8: Inter- and Intra-urban Active Travel Options Assessment Results

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
LCWIPs - Strategically plan intra and inter urban cycling networks across all MEHs	Hampshire districts and boroughs	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Berkshire Unitaries	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Surrey districts and boroughs	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Portsmouth	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
	Southampton	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed
IOW Active Travel network	Expand existing cycle network and accommodate new mobility	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓	Proceed

Intra and Inter- Urban Active Mobility Corridors

For each of the centres and corridors identified previously which stand to benefit from bus-based Mass Rapid Transit, the project team have also considered a series of urban mobility interventions which increase the attractiveness of Active Travel. Innovations such as E-bikes now make cycling longer-distances between centres possible. Through providing segregated cycling infrastructure, there is opportunity to make these cycle trips safer, more accessible and faster for users. Inter-urban mobility corridors can also support cycling for leisure. Lastly, they can support local placemaking, with new mobility infrastructure acting as the spine which supports a transformation of public places.

Packages and Options Assessments Results (9 of 9)

Strategic Highways

The proposed interventions centre around strengthening connectivity between the South Coast with the rest of Great Britain, providing resilience and accommodating road freight.

The A34 is a key freight corridor between Southampton and the Midlands. Whilst the road tends to have sufficient capacity, there are conflicts between strategic freight traffic and local movements during peak hours. It is recommended to assess options to address constraints further.

The A3 through Guildford similarly experiences significant peak congestion due to conflicts between strategic traffic and local movements. Further analysis is being undertaken to determine the split between strategic and local traffic. It is noted National Highways are conducting an extensive study to identify options. The TfSE project team recommend an approach to overcome these conflicts principally through sustainable transport options and without substantial highway capacity enhancement.

Table 5.9: Highway Options Assessment Results

Intervention	Option	Policy Alignment Scores			Average Assessment Scores			Park or Proceed?
		National	Local	TfSE	Strategic	Economic	Delivery	
A34 Resilience	A34 Online enhancements	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
	A34 Upgrade to motorway standard	✓✓	✓✓✓	✓	✓	✓✓	✓	Park
	A34 Strategic junction improvements	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	Proceed
A3 Guildford upgrades	A3 Guildford Online enhancements	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed
	New Guildford bypass	✓✓	✓✓	✓	✓	✓✓	✓	Park
	New Guildford tunnel	✓✓	✓✓	✓✓	✓	✓✓	✓	Park
	Local interventions within Guildford to segregate local and strategic traffic and encourage a shift to other modes for local journeys	✓✓	✓✓	✓✓✓✓	✓✓✓	✓✓	✓✓	Proceed
A3/A247 Ripley Junction	RIS3 Pipeline	✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed
A31 Farnham Corridor	LLM Priority	✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed
M3 Junction 6, 7 and supporting road/active travel upgrades - enabling access to a new development		✓✓	✓✓✓	✓✓	✓✓	✓✓	✓✓	Proceed
M3 Junction 8/A303 upgrades		✓✓	✓✓✓	✓✓	✓✓	✓✓	✓✓	Proceed
M3 Junction 9 improvements	RIS2 scheme	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
M3 J9-14 - Smart Motorway		✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
M3 J4a-9 - Smart Motorway		✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed
M27 J3/M271 - Southampton Access		✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed
Woking A320 North Scheme	MRN Priority	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	Proceed
Solent Area Lorry Parking Scheme		✓✓	✓✓✓	✓✓✓✓	✓✓	✓✓	✓✓✓	Proceed
M4 Junction 10 upgrades	Address congestion and safety concerns	✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	Proceed

Packages and Options Assessments Results Summary

Informed by the MCAF the following packages have been developed to be subject to further modelling and assessment.

Package 1a: Strategic Rail
- Woking Enhancement Scheme
- Basingstoke Enhancement Scheme
- South West Main Line upgrades
- Portsmouth Direct line upgrades
- Reading to Bracknell to London upgrades
- Reading to Basingstoke rail line upgrades

Package 1b: Out of Region Rail
- CrossCountry service improvements
- Test Valley Line upgrades and service improvements

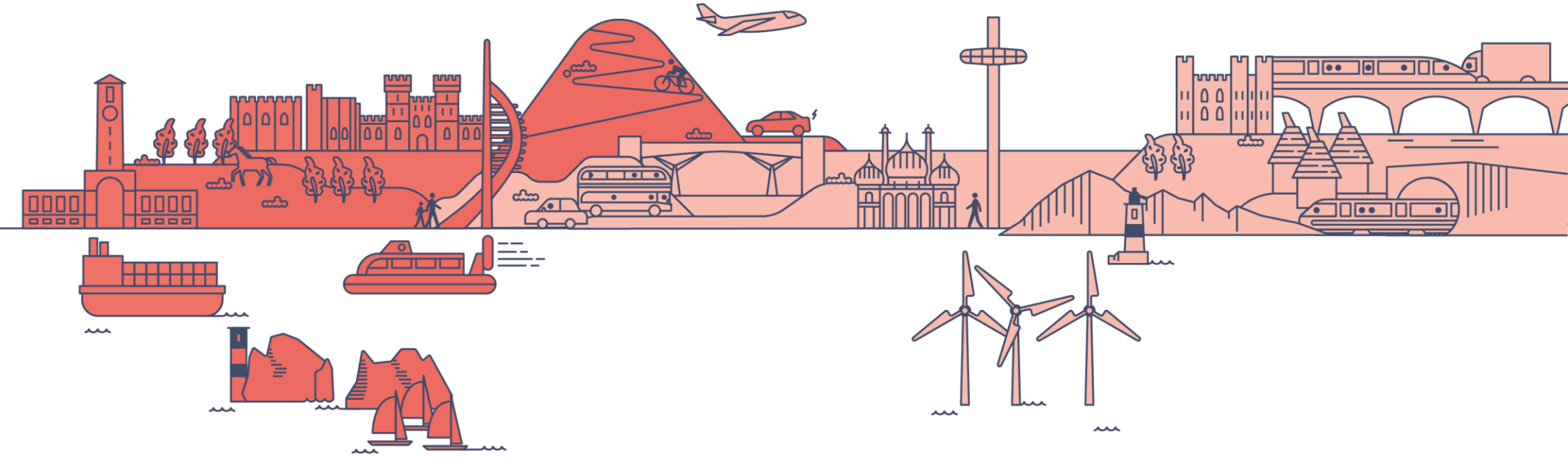
Package 1c: Strategic Rail Freight
- Improved Rail Freight Access to Solent Ports
- Rail Paths between Solent Ports and Rest of GB
- Strategic and Local Rail Freight Consolidation Centres

Package 2: Isle of Wight
- Isle of Wight – Mainland Ferry service enhancements
- Isle of Wight – Mainland Ferry fare measures
- Integrated Ferry, Rail, MRT and Active Travel connectivity on the Isle of Wight
- Bus priority and bus service enhancements
- High quality, segregated cycling infrastructure
- Isle of Wight Railway restoration

Package 3: Mass Transit and Mobility
- Bus service improvements and infrastructure and priority measure where appropriate between all adjacent major economic hub pairs.
- Bus-based MRT networks for intra-urban connectivity in all major economic hubs in the area.
- MRT corridors to be delivered alongside high quality, segregated cycle infrastructure.

Package 4: Strategic Highways
- A34 Online upgrades and improvements to junctions
- A3 Guildford upgrades
- A31 Farnham Corridor
- Woking A320 North Corridor
- M3 J6-8 Junction improvements and J9-14 Smart Motorway

Global Policy Package: Includes further new mobility, rural connectivity, demand management, and accelerated decarbonisation interventions.



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.

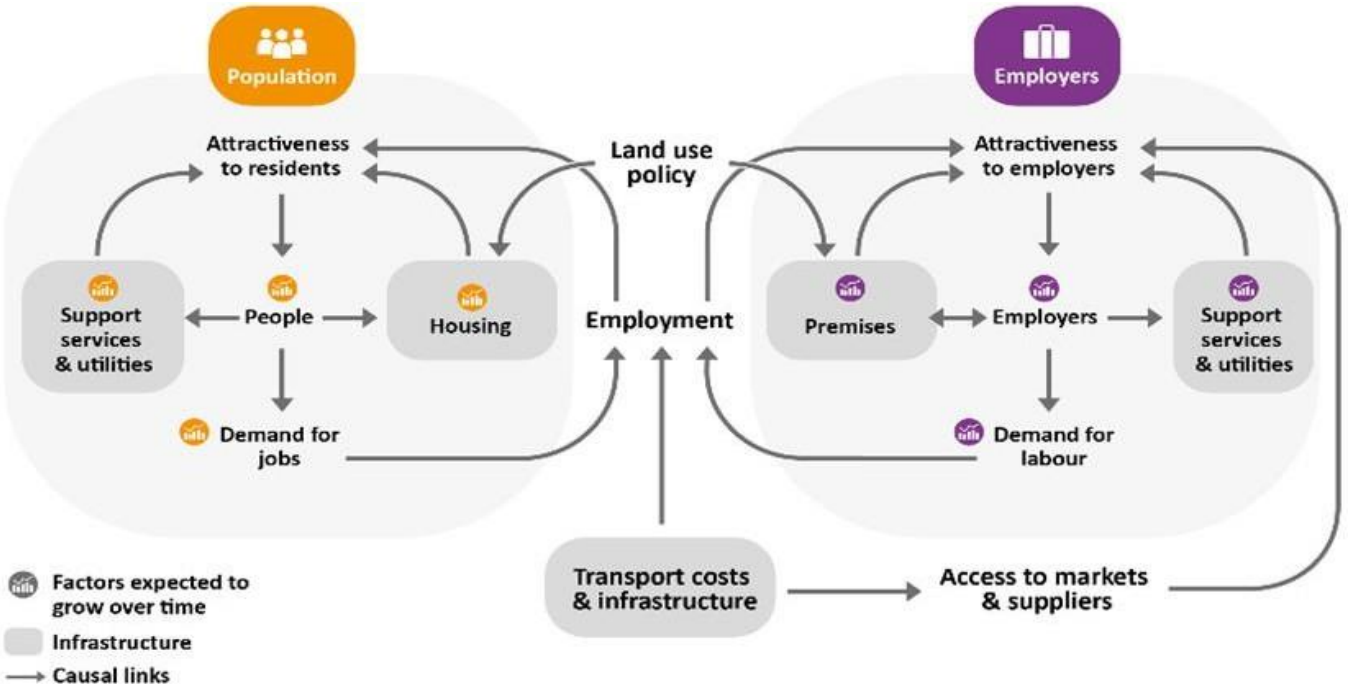
This model, known as the South East Economy and Land Use Model (SEELUM), is a transport and land use model that simulates the interaction of transport, people, employers and land- use over periods of time.

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

Due to the geographical scope and inter-modal nature of the Area Studies, it has been 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.

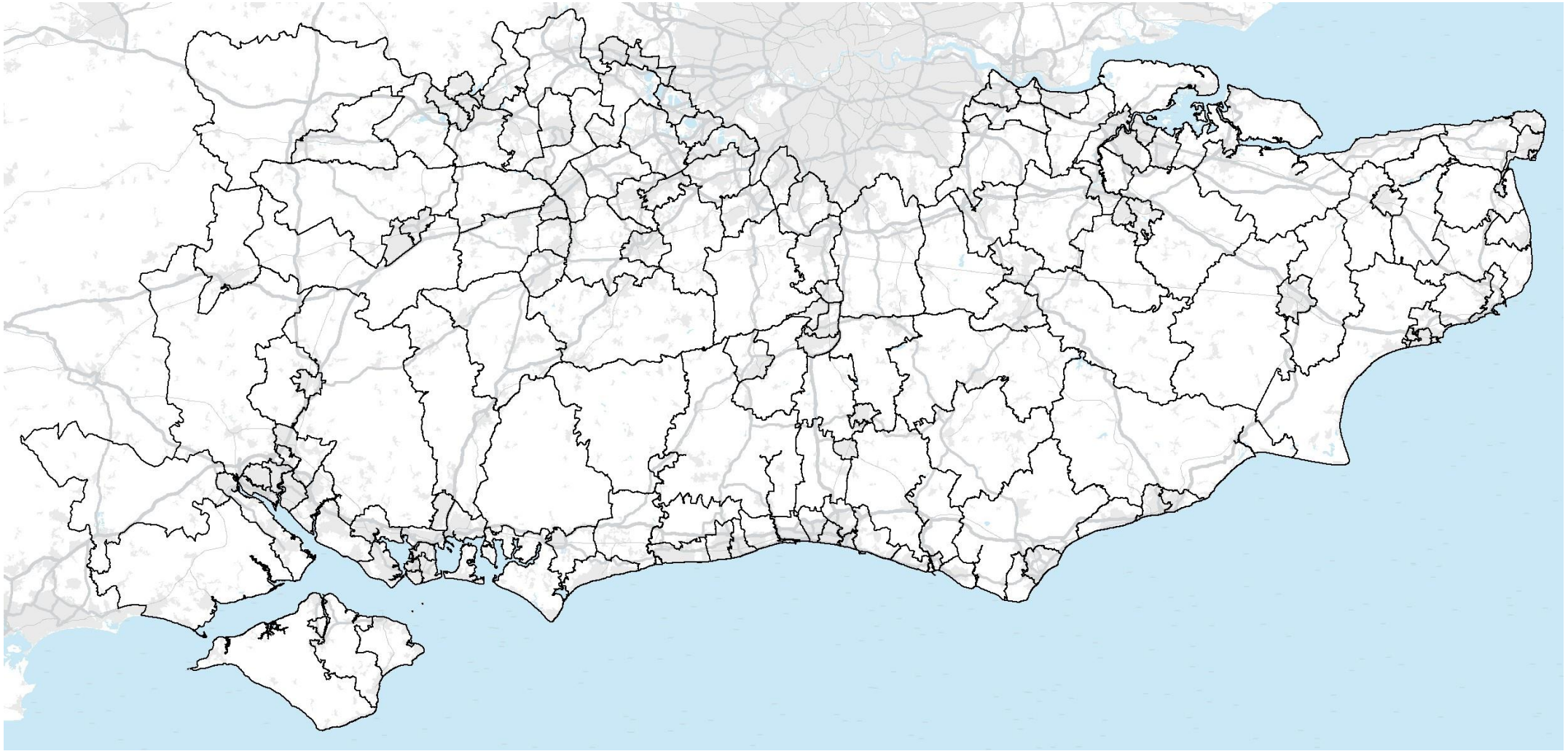
A map showing the zones included in the SEELUM model is provided in Figure 6.2 overleaf.

Figure 6.1: SEELUM



Introduction to SEELUM (2 of 3)

Figure 6.2: SEELUM Zones



Introduction to SEELUM (3 of 3)

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 also 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 internal models of highways, bus and rail services, and walking and cycling networks. These all connect places together and influence their relative advantages as places to live or work.

SEELUM can incorporate planned land-use changes and investment in transport infrastructure or services.

SEELUM produces detailed reports on:

- changes in land-use in each zone (i.e., the number of housing units and number of 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_2 emissions from transport activity; and
- travel patterns, volumes and mode shares; and
- time savings benefits for appraisal, and the wider economic impacts on productivity and agglomeration.

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.

Package 1a: Strategic Railways

This Package sets the scene for the South West Radial area study, delivering a fast, frequent, high capacity, and resilient railway arc connecting a string of Major Economic Hubs along the South West Main Line, Portsmouth Direct Line, and supporting branch lines.

SEELUM will model the agglomerated benefit to rail passengers from realising a number of interventions including the Woking Enhancement Scheme (Woking flyover) and Basingstoke Enhancement Scheme, which will increase the capacity, journey speeds and reliability of services.

The initiatives included in this package, and our approach to modelling their effects, are summarised in the table aside.

Note, SEELUM has not been used to exclusively model rail freight interventions

Table 6.1: SEELUM Modelling Adjustments (Package 1a)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 1a: Strategic Railways	**South West Main Line upgrades**	The modelling will capture the benefit of: • Woking Enhancement Scheme (Woking flyover) • Basingstoke Enhancement Scheme • Station/Junction improvements at Eastleigh and the approach to Southampton The modelling will capture the associated line speed and journey time improvements, such as trains being less likely to be held up at at-grade separated junctions at Woking or Basingstoke. The modelling will also reflect capacity enhancements to deliver more frequent services, both long-distance and local services. This includes introducing dynamic signalling and rationalising the existing timetable to ensure service patterns ensure effective journey times between major centres. The modelling will lastly reflect journey time improvements for passengers through introducing demand responsive services for both peak commuter and leisure markets, such as superfast London to Southampton services, dedicated direct services between London and Southampton cruise terminal and additional direct services to leisure attractions and events such as festivals.	This intervention has been modelled by applying a 5% increase in capacity and 5% reduction in journey times along the following links: • RL13 • RL59 • RL11 • RL57 • RL6 • RL52 A higher 10% increase in capacity and 10% reduction in journey times along the following links to capture the Basingstoke flyover, passing loops between Basingstoke and Winchester, and opportunity of turnback at Micheldever: • RL7 • RL53

Package 1a: Strategic Railways

As per the South West Main Line, the Portsmouth Direct line also stands to benefit from a number of intervention and delivery a fast, frequent, high capacity, and resilient railway for residents along the line.

SEELUM will model the agglomerated benefit to rail passengers from realising several junction interventions at Woking, Guildford and line speed enhancement initiatives between Guildford and Portsmouth. In combination, these will increase journey speeds and reliability of services for long-distance and local passengers travelling between Portsmouth, Guildford and London.

Table 6.2: SEELUM Modelling Adjustments (Package 1a)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 1a: Strategic Railways	**Portsmouth Direct line upgrades**	The modelling will capture the benefit of: • Woking Enhancement Scheme (Woking flyover) • Guildford station and junction improvements (Captured in the Inner Orbital area study) The modelling will capture the associated line speed and journey time improvements, such as trains being less likely to be held up at at-grade separated junctions at Woking. The modelling will also capture capacity enhancements to deliver more frequent services, both long-distance and local services. This includes introducing dynamic signalling and rationalising the existing timetable to ensure service patterns ensure effective journey times between major centres. Additionally, the modelling will reflect will capture the journey time improvements for passengers through introducing demand responsive services for both peak commuter and leisure markets, such as superfast London to Portsmouth services, dedicated direct services between London and Portsmouth/IOW ferry terminal and additional direct services to leisure attractions and events such as festivals.	This intervention has been modelled by applying a 5% increase in capacity and 5% reduction in journey times along the following links: • RL40 • RL86 • RL41 • RL87 • RL42 • RL88 • RL34 • RL80 A higher 10% increase in capacity and 10% reduction in journey times along the following links to capture the benefits of the Woking flyover for services between Portsmouth, Guildford and London which stand to benefit most from the delivery of the flyover: • RL12 • RL58

Package 1a: Strategic Railways

The Bracknell Line and Reading to Basingstoke Rail line also stand to benefit from a range of interventions, resulting in faster and more reliable journey times for passengers.

As per the South West Main line and Portsmouth Direct line, SEELUM will model the agglomerated benefit to rail passengers from realising infrastructure enhancements such as passing loops to enable faster services to overtake slower services and initiatives such as the introduction of dynamic signalling and timetable optimisation to maximise the utility of infrastructure enhancements.

Table 6.3: SEELUM Modelling Adjustments (Package 1a)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 1a: Strategic Railways	**Bracknell to London faster services**	This will model the simplification of service pattern to enable faster services between Bracknell, Ascot, Staines and London. It includes the introduction of dynamic signalling and includes provision of passing loops where applicable to enable overtaking of slower services. This will ensure service at intermediate stations is maintained whilst ensuring faster, more reliable journey times between key Major Economic Hubs in Berkshire, Surrey and London.	This intervention has been modelled by applying a 5% increase in capacity and 5% reduction in journey times along the following links: • RL23 • RL69 • RL22 • RL68
	Reading to Basingstoke rail line upgrades	This will model the capacity and line speed benefits through infrastructure enhancements to increase line speeds, introduction of dynamic signalling and includes provision of passing loops where applicable to enable overtaking of slower services and freight services. It will model the Basingstoke Enhancement Scheme, which will enable trains to travel between the SWML and Basingstoke-Reading line more quickly and reliably without being held up at a junction. It includes the benefits of electrification, which contribute to increasing the acceleration and speed of rolling stock. Lastly, by applying railway link adjustments, the strategic implications for long-distance rail connectivity on the wider network will be captured. This will to an extent reflect the journey speed, capacity and reliability improvements of Cross-country services.	This intervention has been modelled by applying a 25% increase in capacity and 25% reduction in journey times along the following links: • RL9 • RL55

Package 1b: Out of Region Rail Connectivity

There is an opportunity to transform CrossCountry services and strengthen connectivity between South Hampshire and other large conurbations in the Midlands such as Birmingham and Oxford via faster, more frequent CrossCountry services.

The aim is to double the frequency of service between Southampton and the Midlands, reinstate direct CrossCountry services to Portsmouth and greatly reduce journey times by reducing the number of intermediate stops and deliver infrastructure enhancements, most notably on the Reading to Basingstoke section of railway which CrossCountry Services will stand to benefit from.

Table 6.4: SEELUM Modelling Adjustments (Package 1b)

	Interventions	Impact and Benefits	Modelling Adjustments

Package 1b: Out of Region Rail Connectivity	**CrossCountry and out of region service improvements**
	
	(Improved Regional connectivity between South Hampshire, Basingstoke, Reading and the Midlands and North)
		This will model a new direct rail service and/or an increase in frequency and small increases in GJT from interventions described above for the following CrossCountry services:
		• Increase from 1tph to 2tph: Southampton – Basingstoke - Reading – Midlands
		• Increase from 0tph to 1tph (or having to interchange at Eastleigh/Southampton onto a 1tph service): Portsmouth – Eastleigh – Basingstoke – Reading – Midlands
			This intervention has been modelled by applying rail GJT reductions between the following zones as follows:
			• 20 min frequency improvement/new direct connection + 10 min journey time improvement = 30 min GJT reduction between:
			  • Portsmouth 01-04,Havant 01-04, Gosport 01, Fareham 01-02; and
			  • South Oxfordshire 01-02, Oxford District 01, Cherwell 01, West Mids 01-02, East Mids 01-03, North West, Yorkshire and Humber
			• 15 min frequency improvement + 5 min journey time improvement
			= 20 min GJT reduction between:
			  • Southampton 01-04, Eastleigh 01-04, Winchester 01-03, Basingstoke and Deane 01-04, West Berkshire 01, West Berkshire 01, Reading 01-03; and
			  • South Oxfordshire 01-02, Oxford District 01, Cherwell 01, West Mids 01-02, East Mids 01-03, North West, Yorkshire and Humber
			• 10 minute GJT reduction (frequency) for stations between Portsmouth and Eastleigh and rest of TfSE Area reflecting a better service on the Botley line (except Southampton which is captured in the Outer Orbital Area Study Solent CMSP package).

Package 1b: Out of Region Rail Connectivity

Similarly, there is an opportunity to strengthen connectivity between South Hampshire and Bristol, the South West and Wales via delivering faster and more frequent services along the Test Valley line.

Current journey times between Southampton and Bristol are very slow, often taking much longer than the timetabled 1 hour and 40 minutes. Services typically call at 8 intermediate stations. The aim will be to reduce journey times through infrastructure enhancements and reducing calls.

Additionally, connectivity between Southampton, Romsey and Salisbury is set to benefit from infrastructure enhancements on the Test Valley line.

Table 6.5: SEELUM Modelling Adjustments (Package 1b)

	Interventions	Impact and Benefits	Modelling Adjustments

Package 1b: Out of Region Rail Connectivity	**Test Valley Line upgrades and out of region service improvements**
	
	(Improved Regional connectivity between South Hampshire and Salisbury, the South West and Wales)
		This will model an increase in frequency and small increases in GJT from interventions described above for the following Great Western Railway services operating on the Test Valley Line:
		• Increase from 0.5/1tph to 2tph between Portsmouth – Southampton – Romsey – Salisbury – Warminster – Westbury and beyond to Bath, Bristol or Cardiff.
		• Reduce intermediate stops on one service to allow for faster end to end journey times.
		• Additional local services (up from 1tph to 2tph on both between Southampton – Romsey and Salisbury (via Eastleigh and Chandlers Ford or via Totton curve)
			This intervention has been modelled by applying rail GJT reductions between the following zones as follows:
			• 15 min frequency improvement/new direct connection + 5 min journey time improvement = 20 min GJT reduction between:
			  • Portsmouth 01-04, Havant 01-04, Gosport 01, Fareham 01-02, Southampton 01-04, Eastleigh 01-04; and
			  • Test Valley 01-02, South West 01-05, Wales 01-03.
			• 15 min frequency improvement/new direct connection + 5 min journey time improvement = 20 min GJT reduction between:
			  • And Test Valley 01-02 and
			  • South West 01-05, Wales 01-03.

2: Isle of Wight connectivity

This package includes increasing the frequency of ferry services, extend their hours of operation, and increasing the offer of services, including new services such as Ryde to Southampton.

Furthermore, to maximise this potential and ensure seamless integration, there is a need to ensure effective integration with the transport network on the Isle of Wight and on the mainland.

The project team identify the Isle of Wight as a potential exemplar for Public Transport given its size and unique characteristic of not being connected to the national road network. With investment in ferries and public transport on the Island, there is opportunity to make the most of existing infrastructure by reinstating disused railways and complementing rail with a bus-based Mass Rapid Transit system connecting key destinations across the Island including ferry terminals and tourism hotspots.

Table 6.6: SEELUM Modelling Adjustments (Package 2)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 2: Isle of Wight Connectivity	**Isle of Wight – Mainland Connectivity**	This modelling will aim to reflect the benefits to users wishing to travel between the Isle of Wight with the mainland. The priority intervention in this package will be transforming ferry services between the Ferry Gateways of the Isle of Wight (Cowes, Ryde and Yarmouth), with the Mainland gateways of Southampton, Portsmouth, Southsea, Lymington). Furthermore, this package will include interventions to improve sustainable access to the ferry gateways on the Isle of Wight and better access via rail between the ferry terminals in Portsmouth and Southampton and the railway network, offering seamless integration between ferry and rail for onward connectivity. SEELUM utilises rail as a proxy for modelling ferry connectivity between the Isle of Wight and Mainland. This is due to the railway journey time matrix accounting for ferries in the base data, whilst also capturing rail for onward connectivity to other destinations in Great Britain.	This package has been modelled by applying rail GJT reductions which serve as a proxy for an improvement in frequency, journey times and new services for ferries. Furthermore, this will then incorporate the integration to the railway network for onward connectivity to the rest of Great Britain. The applied GJT reductions are as follows: • A 30 min journey time improvement between IOW 01-03 and Portsmouth • A 45 min journey time improvement between IOW 01-03 and Havant, Fareham and Chichester • A 60 min journey time improvement between IOW 01-03 and the rest of the UK
	Isle of Wight Rail, MRT and Active Travel connectivity	This package aims to model MRT and Active Travel connectivity on the Isle of Wight itself. This includes extending restoring the Isle of Wight Railway to Ventnor and potentially to Newquay via Blackwater.	This package has been modelled by applying rail, bus and active travel GJT reductions of 25% for and between IOW 01-03.

Package 3: Inter- and Intra- Urban Mass Rapid Transit and Mobility

The first aspect of this package envisages a range of bus-based mass rapid transit interventions connecting adjacent Major Economic Hubs within the South West Radial area.

There are two levels of intervention modelled, the first being an enhancement in a service offer, and the second level being introducing infrastructure bus priority measures.

It is challenging to quantify the change in GJTs that might be delivered by improving a bus service. While waiting times can be modelled with relative ease, journey time and interchange times are harder to model at this scale. Assumptions align with assumptions from previous area studies which reviewed existing evidence and case studies.

Benefits such as strategic mobility hubs improving integration and aspects such as comfort have not been explicitly considered at this stage.

Table 6.7: SEELUM Modelling Adjustments (Package 3)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 3: Inter- and Intra- Urban Mass Rapid Transit and Mobility	**Bus Based Mass Rapid Transit – Infrastructure bus priority and bus service enhancements**	Increases the speed, frequency, quality and reliability of bus services along the following inter-urban flows through infrastructure bus priority and service enhancements: • Portsmouth – Cosham – Waterlooville – Petersfield (forms part of the South Hampshire MRT scheme, of which East West movements and intra-Portsmouth and intra-Southampton movements are captured in the Outer Orbital Area Study) • Winchester – Eastleigh – Southampton (much of the benefits in Southampton itself are captured in the Solent bus package in the Outer Orbital Area Study)	These interventions have been modelled by: • **Reducing bus Generalised Journey Times (GJTs) by 20%** between and within all zones along the flows identified. The assumed reduction in GJTs mirrors those derived for comparable interventions between the Outer Orbital and South Central Area Study.
	Bus Based Mass Rapid Transit - Bus service enhancements	Increases the speed, frequency, quality and reliability of bus services within and between adjacent Major Economic Hubs and rural areas in between hubs. These include: • Basingstoke, Winchester, Andover, Cosham, Waterlooville, Petersfield, Alton, Bordon, Haslemere, Andover, Newbury, Winchester, Elmbridge, Runneymede, Spelthorne. Note, many intra-MEHs and Inter-MEH flows are captured in Berkshire, Surrey and North Hampshire.	These interventions have been modelled by: • **Reducing bus GJTs by 20%** between and within all zones along the flows identified.

Package 3: Inter- and Intra- Urban Mass Rapid Transit and Mobility

This Package includes a number of general interventions which aim to improve the quality of walking and cycling infrastructure, supported by a widely accessible cycle hire service. These include developing dedicated, segregated mobility corridors connecting important centres within Major Economic Hubs such as railway stations, schools and hospitals.

What is not explicitly modelled at this stage is the anticipated role of mobility corridors in enhancing local placemaking, which will further increase the attractiveness of active modes and encourage more people to travel for leisure.

These schemes will be implemented in parallel along the corridors identified the previous page.

Table 6.8: SEELUM Modelling Adjustments (Package 3)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 3: Inter- and Intra-Urban Mobility	**Active travel and mobility corridors**	Increases the density, quality and reliability of mobility corridors within and between adjacent Major Economic Hubs and rural areas in between hubs. These include: • Basingstoke, Winchester, Andover, Cosham, Waterlooville, Petersfield, Alton, Bordon, Haslemere, Andover, Newbury, Winchester, Elmbridge, Runneymede, Spelthorne. Note, many intra-MEHs and Inter-MEH flows are captured in Berkshire, Surrey and North Hampshire.	These interventions have been modelled by: • **Reducing active travel GJTs by 10%** between and within zones identified in package 2 to reflect new cycling infrastructure. • Reducing **active travel GJTs by a further 10%** in urban areas where bike sharing schemes have been identified.

Package 4: Strategic Highways

This package targets a limited number of highway improvements in the South West Radial Area which aim to strengthen resilience, accommodate freight traffic, and better serve strategic hubs and growing developments.

Whilst options have not been fully detailed, the possible impacts of interventions subsequently increasing capacity along five sections of Strategic Highway network have been modelled. These include the A34, A3 at Guildford, A31 at Farnham, A320 Between the M25 and Woking and the M3 between Junction 6 and 14.

Table 6.9: SEELUM Modelling Adjustments (Package 4)

	Interventions	Impact and Benefits	Modelling Adjustments
Package 4: Strategic Highways	**A34 online upgrades and improvements to junctions**	Small scale online enhancements to improve regional connectivity between South Coast and rest of the UK, supporting strategic freight movements.	Highway link adjustment to reflect a 2.5% increase in capacity over A34 (L062).
	A3 Guildford upgrades	Small scale online enhancements around A3 in Guildford, segregating local and strategic traffic with local interventions reconfiguring junctions, resulting in better flow of traffic between Portsmouth and the rest of the UK, supporting strategic freight movements.	Highway link adjustment to reflect a 2.5% increase in capacity over A3 (L052, L056).
	A31 Farnham and upgrades	Small scale online enhancements along A31, including improvements to junction such as Hickleys Corner, supporting highway and MRT trips between Guildford and BW Valley.	Highway link adjustment to reflect a 2.5% increase in capacity over A31 (L123).
	A320 North Corridor Enhancement	Small scale online enhancements along A320 between M25 Junction 11, Chertsey South, Ottershaw and Woking.	Highway link adjustment to reflect a 2.5% increase in capacity over A320 (L133).
	M3 J6-8 Junction improvements and J9-14 Smart Motorway	Small scale online enhancements along M3, including improvements to junction 6-8 and roll out smart Motorway between J9-14.	Highway link adjustment to reflect a 2.5% increase in capacity over M3 (L073, L071, L046)

Modelling Results Overview (1 of 2)

A summary of the transport and socioeconomic outcomes generated by SEELUM for each of the Packages (and a combined Package) is provided in **Table 6.10**. below. A more detailed commentary on these results is provided in following pages.

Table 6.10: Modelling Results

	1a	1b	2a	2b	3	4	All Packages
	Strategic Rail	Out of Region Rail	Isle of Wight-Mainland Connectivity	Isle of Wight MRT and Mobility	Mass Rapid Transit and Mobility	Strategic Highways	*Net Combined Impact*
Change in daily trips by mode* (by 2050)							
Δ Car Trips	1,862	(4,072)	2,457	(18,855)	(63,026)	3,575	(78,074)
Δ Rail Trips	13,507	20,020	2,778***	365	(1,238)	(126)	35,737
Δ Bus Trips	(259)	(742)	110	13,091	47,773	(245)	62,310
Δ Active Trips	(207)	(2,455)	(156)	6,478	18,533	(505)	22,351
Δ Total Trips	14,903	12,751	5,189	1,080	2,042	2,699	42,325
Change in socioeconomic outcomes (in 2050)							
Δ Population	2,707	(408)	1,518	431	724	196	4,521
Δ Employment	1,529	882	1,318	191	337	387	4,593
Δ GVA per annum (£m per annum)	266	152	121	11	51	60	660
Δ Carbon** (Initial)	1	(21)	(5)	(9)	(52)	26	(65)
Δ Carbon** (2050)	7	(6)	6	(6)	(33)	26	(9)

**Trips are presented as change in the number of return trips per typical weekday*
***Carbon is presented as thousand metric tonnes of carbon dioxide equivalents (KMTCD)*

****SEELUM utilised using rail GJT times as a proxy to model improvements in ferry services to and from the Isle of Wight (journeys on the Mainland then continue to the final destination via rail)*

Modelling Results Overview (2 of 2)

Package 1a: Strategic Rail

The Strategic Rail package, focusing on targeted enhancements to Main line rail corridors to facilitate faster, more frequent and more reliable services, performs well in stimulating strong economic growth in centres across the area, which in turn is increasing population and stimulating further growth.

However, this surge in economic development is also leading to a small increase in highway trips by 2050.

Package 1b: Out of Region Rail

The South West Radial Area study is the gateway between the TfSE area and the rest of Great Britain.

This package is performing well in generating new rail trips reflecting the increased socio-economic activity with centres outside the TfSE area including Oxford and the Midlands, Salisbury, Bristol and the South West, which leads to more employment and GVA. Improvements to rail services abstract longer distance highway trips which emit more carbon.

Package 2a: Isle of Wight – Mainland Connectivity

The interventions which aim to transform connectivity between the Mainland and Isle of Wight perform well, translating to an almost doubling of ferry ridership.

The more frequent ferry service, offering new routes such as Ryde to Southampton, along with interventions to ensure seamless connectivity with other modes on both ends, attract more people to the island to live, work and for leisure purposes, which which in turn generates significant GVA uplift for the island of an additional £121m per annum.

Package 2b: Isle of Wight MRT and Mobility

The vision for transforming Mass Rapid Transit and Mobility on the Isle of Wight is promising, with strong growth in bus and active travel trips across the area.

However, with the Isle of Wight being cut off from the national highway network, we feel there is further opportunity for modal shift away from the private car.

Package 3: Intra- and Inter-urban Mass Rapid Transit and Mobility

This package, which seeks to implement a step change in bus provision alongside rolling out new mobility initiatives such as shared e-bikes, successfully boost both bus and active travel ridership.

This translates to an abstraction of 63,000 daily highway trips from the area's roads, and this is before accounting for the wider economic benefits of how these measures can support local placemaking.

Package 4: Strategic Highways

Highway interventions present a direct trade off between economic growth (driven by improved connectivity and resilience) and carbon emissions.

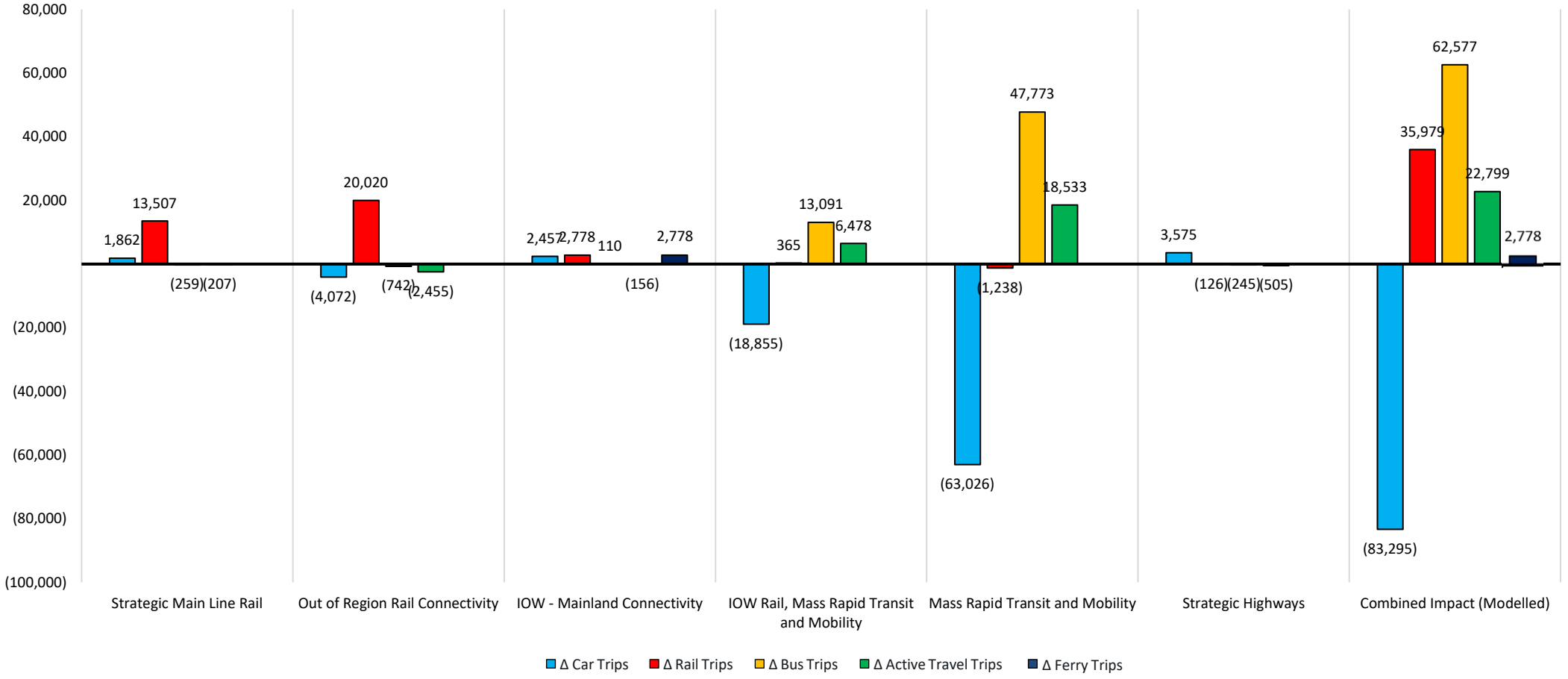
The Package will likely be taken forward by TfSE will seek to strike a balance between these criteria. The economic benefits of accommodating more freight is a key objective for TfSE, and this package helps towards that.

TfSE also developing interventions to help accelerate the decarbonisation of road vehicles and mitigate the adverse impacts of this Package.

Modelling Results Details (1 of 4)

Figure 6.3 below presents the change in weekday return 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. Mass transit and active travel initiative are effective in reducing local car trips.

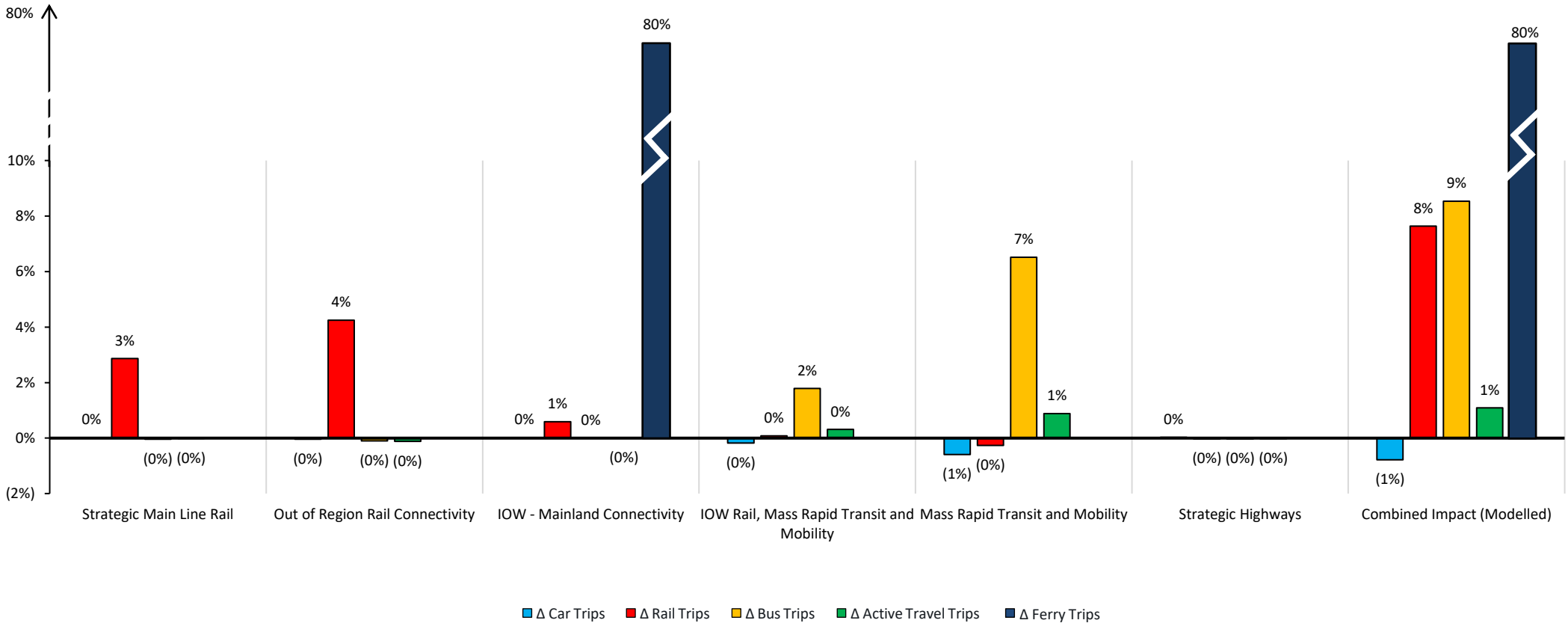
Figure 6.3: Change in weekday trips



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. Most notably, ferry ridership is almost doubled when compared to today. It also highlights the higher growth in rail and mass transit trips that might be achieved if the Packages supporting these modes are delivered, and that strategic Highways Packages appear to have a negligible impact on car trips.

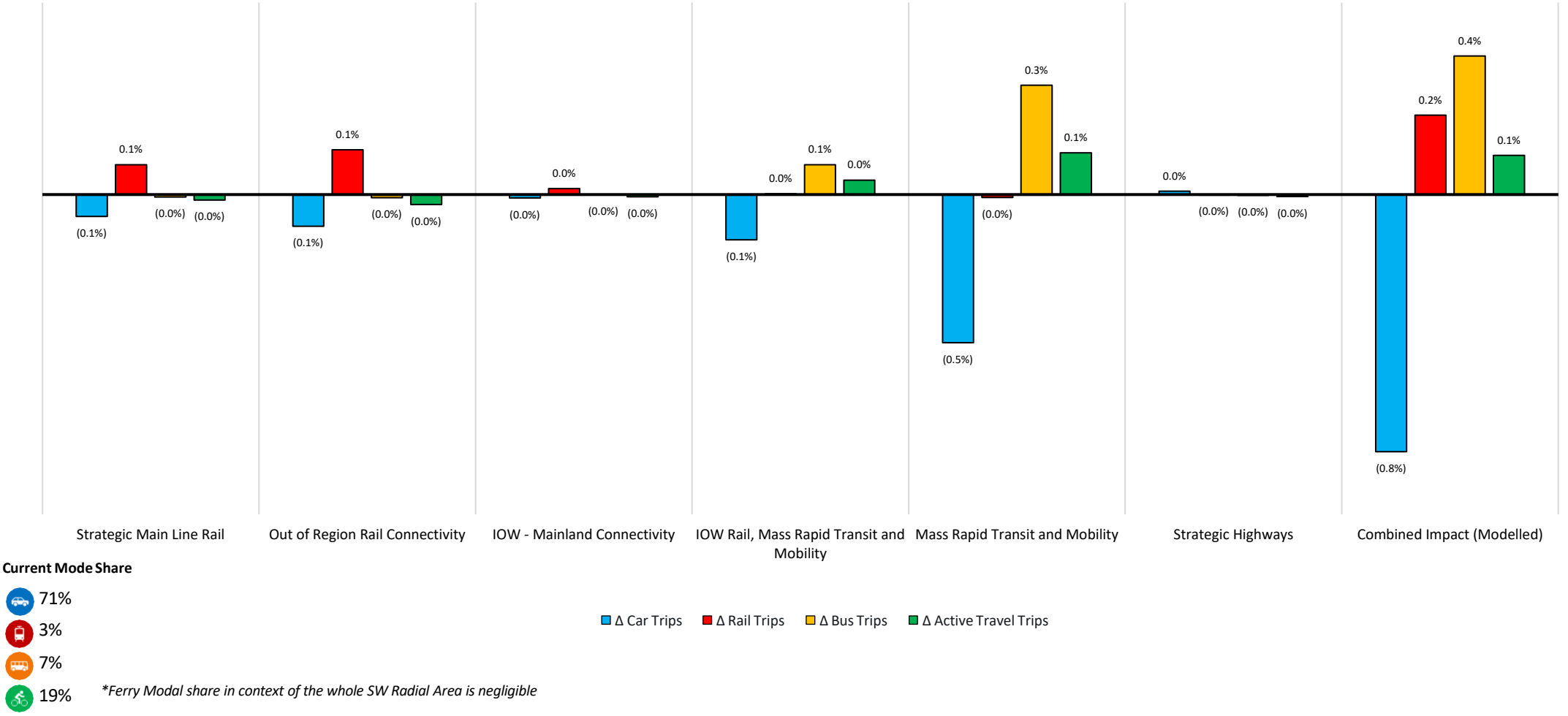
Figure 6.4: Change in weekday trips (%)



Modelling Result 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 away from the car to mass transit and moderate mode shift to rail and active travel.

Figure 6.5: Change in mode share (%)

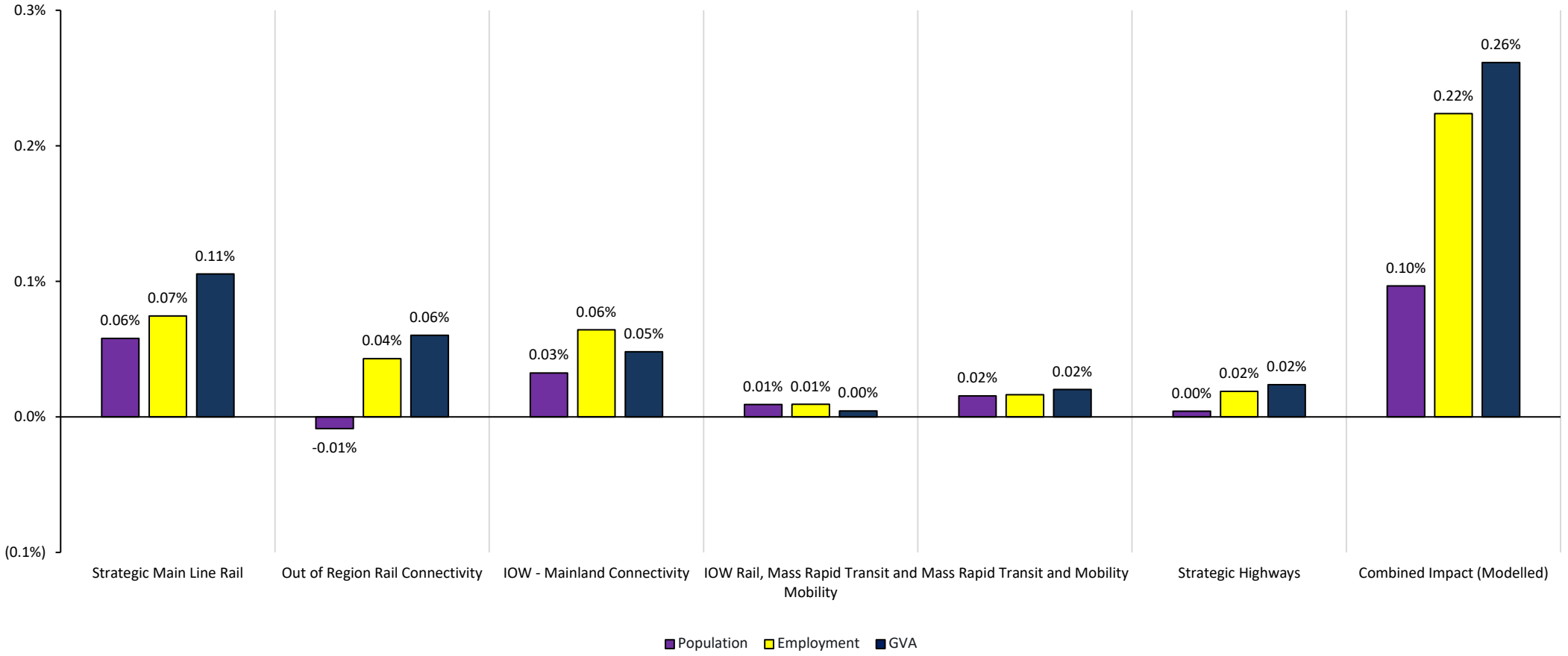


**Ferry Modal share in context of the whole SW Radial Area is negligible*

Modelling Result Details (4 of 4)

Figure 6.6 summarises the key socioeconomic outcomes produced by the model runs (by the year 2050). Combined, the packages make Major Economic Hubs across the area more attractive places to live and work, increasing population and employment. This, along with the focus on increasing strategic connectivity between hubs, translates to a significant uplift in GVA.

Figure 6.6: Socioeconomic Outcomes



Gross Value Added (GVA)

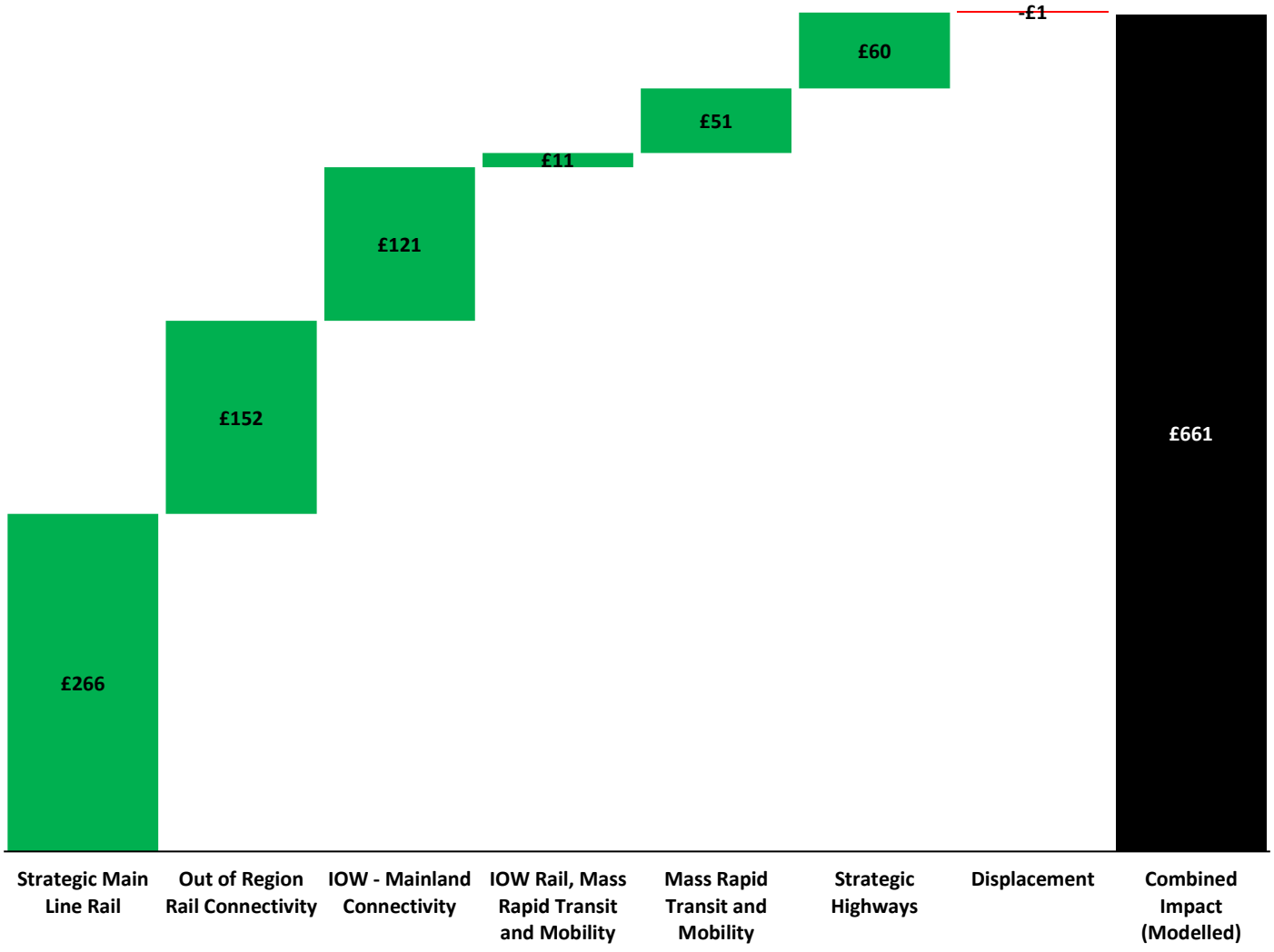
Most Packages generate a boost to population, employment, and (as shown in Figure 6.7. to the right), GVA.

The largest contributors to GVA growth are the Strategic Rail package, followed by the package which specifically looks at improving rail connectivity to areas outside the South East (excluding London).

This is expected as the rail package connects individually successful Major Economic Hubs together and provides synergies for further growth through increasing the potential catchment for businesses to attract workers, suppliers and consumers.

This evidence provides confidence that some of the more ambitious (and therefore costlier) elements of the Solent Rail Packages have the potential to generate significant wider economic benefits. This should help strengthen the case if/when *they* are considered through the Business Case framework.

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

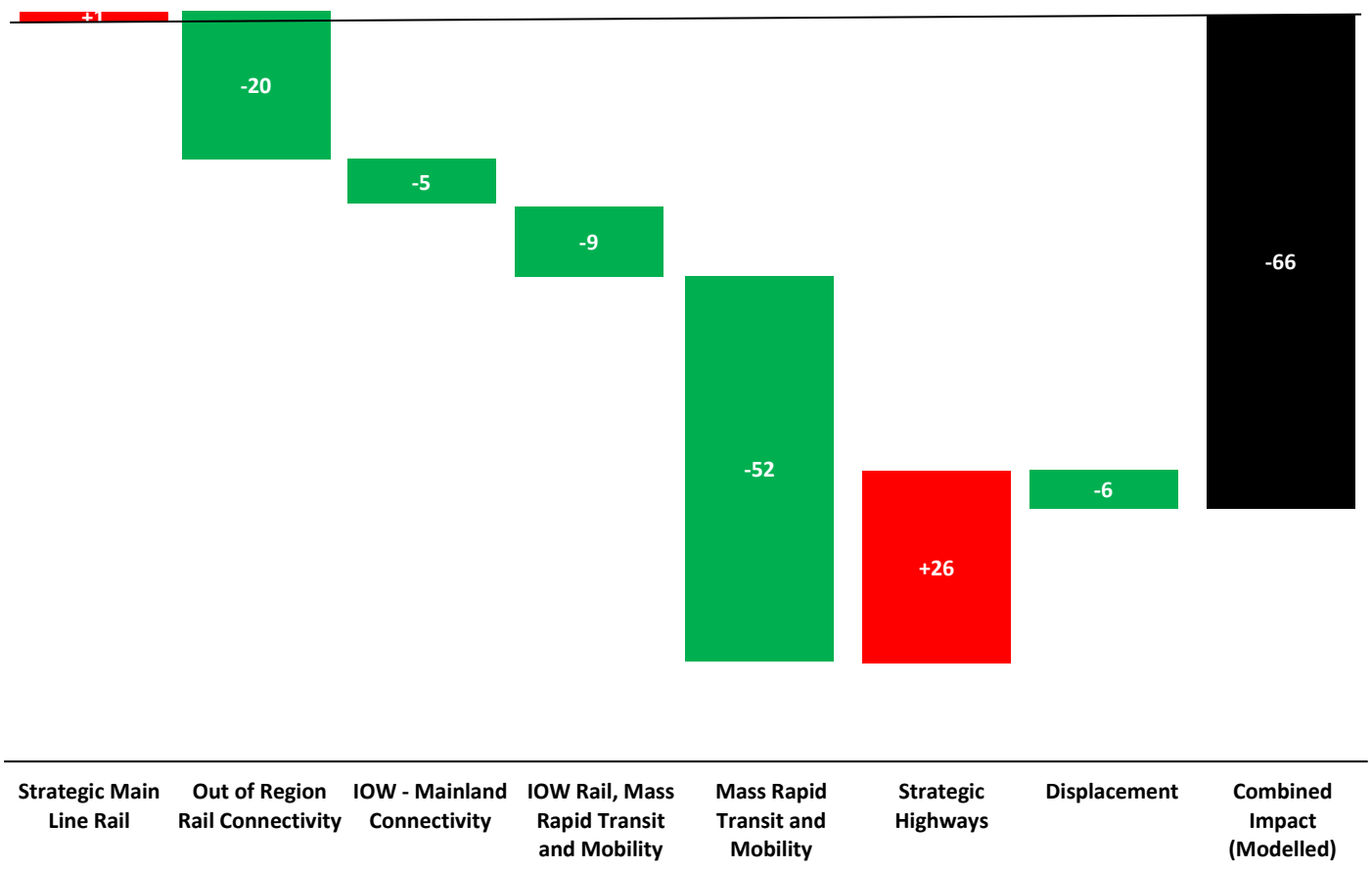
The Mass Rapid Transit and Mobility Package performs best in reducing carbon through successfully generating a modal shift away from the private car to more sustainable modes.

Figure 6.8 provides a breakdown of the contribution of the Packages towards decarbonisation.

The Out of Region Rail package also generates a significant reduction in carbon through a modal shift from longer-distance highway trips to rail. The Strategic Highways Package generates an additional 25KMT of Carbon. The net impact is a net reduction in carbon of 66KMT of CO2 per annum.

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)



Carbon is presented as thousand metric tonnes of carbon dioxide equivalents (KMTCD)

Package Alignment to Problem Statements and Objectives

Alignment with Problem Statements

In Part 2 we listed 19 Problem Statements that the South West Radial Area Study aims to address (see page 22).

Table 6.11 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 Statemen
✓✓ Mostly addresses Problem Statement
✓ Partially addresses Problem Statement

Table 6.11 includes a column on the right under the heading 'Combined 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 'Combined Packages' is also assigned two ticks.

Table 6.11 shows that most Problem Statements are fully addressed by the Packages presented in this report.
That said, five Problem Statements are 'mostly' addressed and on Problem Statement is only 'partially' addressed.
The Problem Statements that are not (yet) fully addressed relate to:

- climate resilience;
- M25 South West Quadrant;
- Radial connectivity to Heathrow

A number of these Problem Statements are addressed in further detail in separate area studies. (E.g. M25 South West Quadrant and Connectivity to Heathrow in Inner Orbital).
The Area Study programme will also 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 remaining gaps highlighted in Table 6.11.

Alignment with Objectives

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

Table 6.10 below summarises the number of interventions in each Package that have a 'high' or 'very high' alignment with the objectives of the South West Radial Area Study.

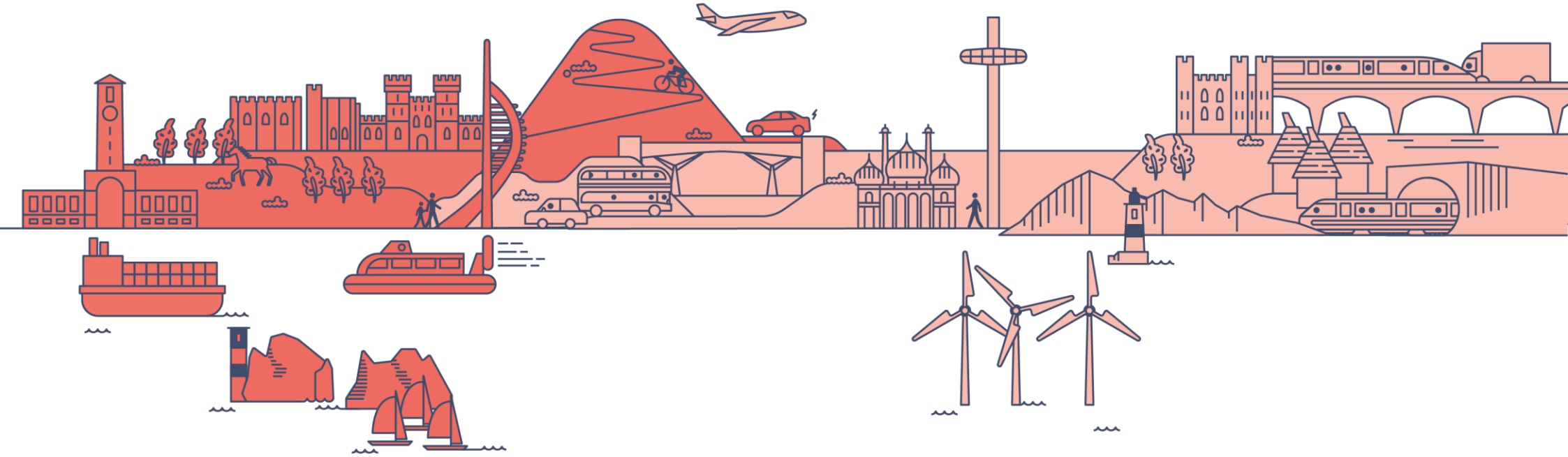
Table 6.10: Interventions and objectives

Objective	Interventions
Economy	46
Society	40
Environment	14
Climate Change	29
Safety	30
Health & Wellbeing	38

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 6.11: Problem Statement Mapping to Packages

Problem Statement	Strategic Rail	Out of Region Rail	Rail Freight	Isle of Wight	Mass Rapid Transit and Mobility	Strategic Highways	Combined Packages
Decarbonisation	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓	✓✓✓
Climate resilience	✓	✓✓	✓	✓✓	✓	✓✓	✓✓
Socioeconomic outcomes	✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	✓✓✓
Housing (need plan planning)	✓✓✓	✓	✓			✓	✓✓✓
Covid-19	✓✓✓	✓✓✓	✓	✓	✓	✓	✓✓✓
Bus is uncompetitive				✓✓✓	✓✓✓		✓✓✓
Strategic local trips	✓✓✓	✓		✓✓	✓✓	✓	✓✓✓
Out of region connectivity		✓✓✓				✓	✓✓✓
Isle of Wight congestion				✓✓✓			✓✓✓
Isle of Wight connectivity				✓✓✓			✓✓✓
Isle of Wight accessibility				✓✓✓			✓✓✓
Access to Solent Ports	✓✓	✓✓	✓✓	✓✓✓	✓✓✓	✓	✓✓✓
M25 South West Quadrant	✓✓		✓✓	✓	✓		✓✓
Low active mode participation				✓✓✓	✓✓		✓✓✓
Rail freight	✓	✓	✓			✓	✓✓✓
Portsmouth Direct Line speed	✓✓✓					✓	✓✓✓
SWML Capacity constraint	✓✓✓	✓	✓✓		✓	✓	✓✓✓
Rail connectivity between hubs	✓✓✓	✓	✓✓			✓	✓✓✓
Radial connectivity to Heathrow	✓	✓	✓				✓



Part 7

Next Steps

Recommendations

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

Package 1a: Strategic Rail
- Woking Enhancement Scheme
- Basingstoke Enhancement Scheme
- South West Main Line upgrades
- Portsmouth Direct line upgrades
- Reading to Bracknell to London upgrades
- Reading to Basingstoke rail line upgrades

Package 1b: Out of Region Rail
- CrossCountry service improvements
- Test Valley Line upgrades and service improvements

Package 1c: Strategic Rail Freight
- Improved Rail Freight Access to Solent Ports
- Rail Paths between Solent Ports and Rest of GB
- Strategic and Local Rail Freight Consolidation Centres

Package 2: Isle of Wight
- Isle of Wight – Mainland Ferry service enhancements
- Isle of Wight – Mainland Ferry fare measures
- Integrated Ferry, Rail, MRT and Active Travel connectivity
- Bus priority and bus service enhancements
- High quality, segregated cycling infrastructure
- Isle of Wight Railway restoration to Newquay and Ventnor.

Package 3: Mass Transit and Mobility
- Bus service improvements and infrastructure and priority measure where appropriate between all adjacent major economic hub pairs.
- Bus-based MRT networks for intra-urban connectivity in all major economic hubs in the area.
- MRT corridors to be delivered alongside segregated cycle infrastructure.

Package 4: Strategic Highways
- A34 Online upgrades and improvements to junctions
- A3 Guildford upgrades
- A31 Farnham Corridor
- Woking A320 North Corridor
- M3 J6-8 Junction improvements and J9-14 Smart Motorway

Global Policy Package: Includes further new mobility, rural connectivity, demand management, and accelerated decarbonisation interventions.

Next Steps

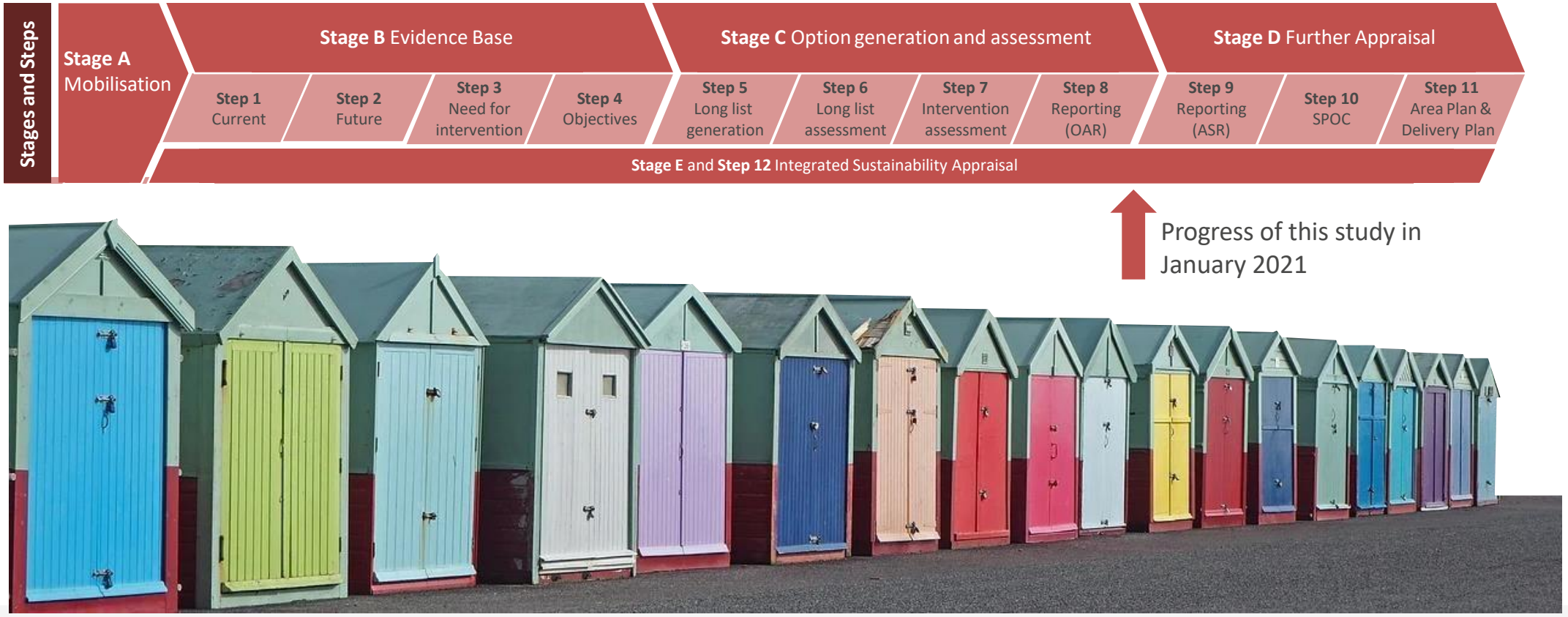
This report has summarised the work undertaken in the third of the five stages underpinning the South West Radial area study.

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 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 January 2022.

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 West Radial area study stages and steps



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