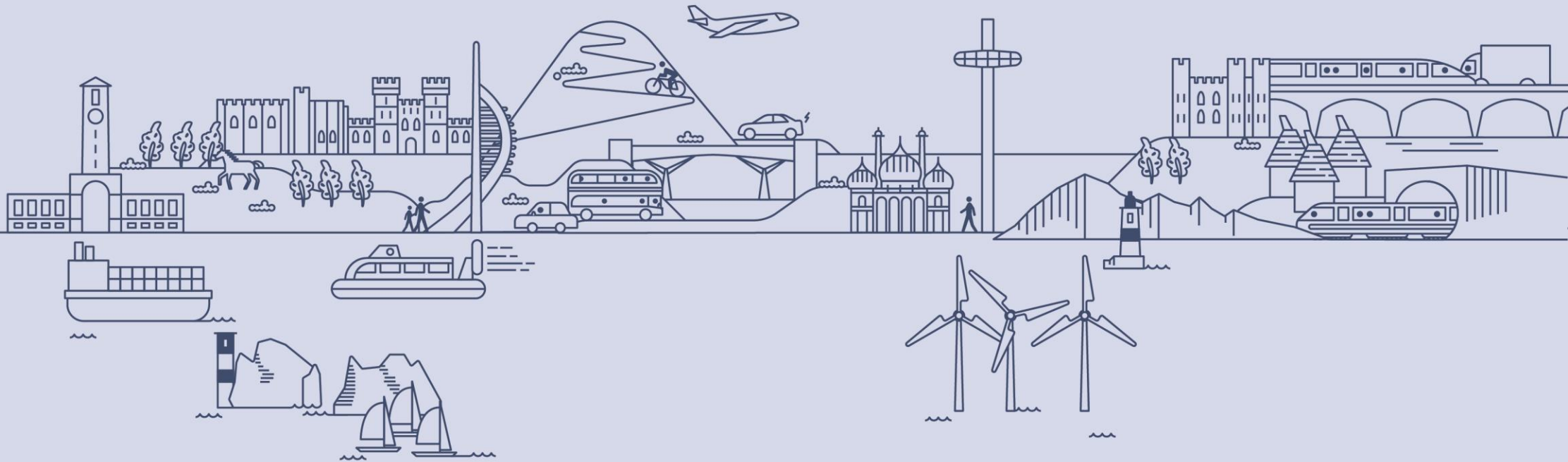


Rail Thematic Plan

Version 7

March 2023



Part 1: Introduction

Introduction

Purpose

This Thematic Plan outlines TfSE’s ambitions for the South East’s rail network.

This Plan forms part of TfSE’s Area Study Programme, which developed Strategic Outline Programme Cases for four areas within South East England. It complements five other Thematic Plans for Highways, Mass Transit and Bus, Decarbonisation, Strategic Active Travel and Micromobility, and Levelling Up (see **Figure 0** overleaf for the document hierarchy).

This Plan describes the current issues and challenges facing the South East’s rail network. It also explores how the rail network could develop to counter future threats and leverage future opportunities.

This Plan then outlines seven Packages of Interventions that have been developed by TfSE’s Area Study Programme. It describes the potential benefits each Package could generate, and presents early estimates for their capital costs.

This Plan also outlines how the Packages of Interventions might be delivered, and explores how TfSE can play a role in bringing this Plan to life.

Contents

The rest of this Plan is presented in six Parts, which are listed below.

- **Part 2** describes the historical **context** of the South East’s railways, from the earliest developments to the COVID-19 pandemic and creation of Great British Railways. It also discusses where rail is best placed to add value, and how.
- **Part 3** summarises the key **issues and opportunities** relevant to the South East’s rail network that have been identified by the Area Studies.
- **Part 4** outlines TfSE’s long-term strategic **Vision and Objectives** for the GB rail network.
- **Part 5** describes seven **Packages of Interventions** that have been developed to enable TfSE to secure its Vision and Objectives.
- **Part 6** presents the estimated **benefits and costs** associated with each Package of Intervention.
- Finally, **Part 7** considers how to **deliver** the Packages of Interventions.

Next Steps

TfSE’s Strategic Investment Plan will make the case for investing in rail.

TfSE is developing a Strategic Investment Plan (SIP) that will make the case for investing in rail. The SIP will synthesise the technical documents prepared to date and present a compelling case for investment in all modes of transport in South East England.

The SIP will include a more detailed examination of potential funding opportunities beyond Central Government, and it will outline how TfSE, its partners, and its constituent authorities will work together to deliver positive change.

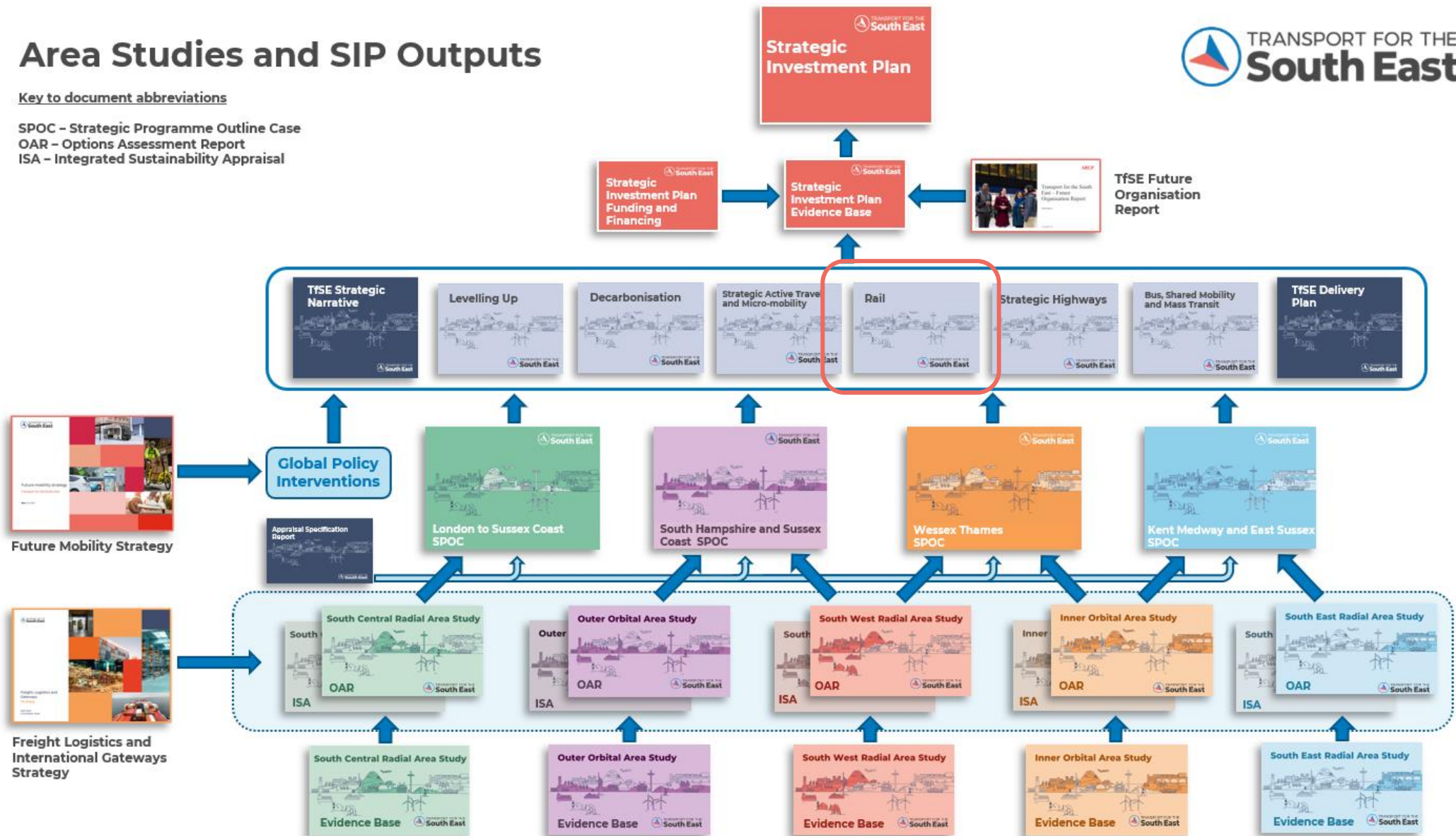
Although the Transport Strategy approved and published in 2020 is not a Statutory Document, the UK government has stated it will give “due regard” to it. The SIP is an integral part of the Transport Strategy development process, articulating the case for investment and a delivery plan to 2050.

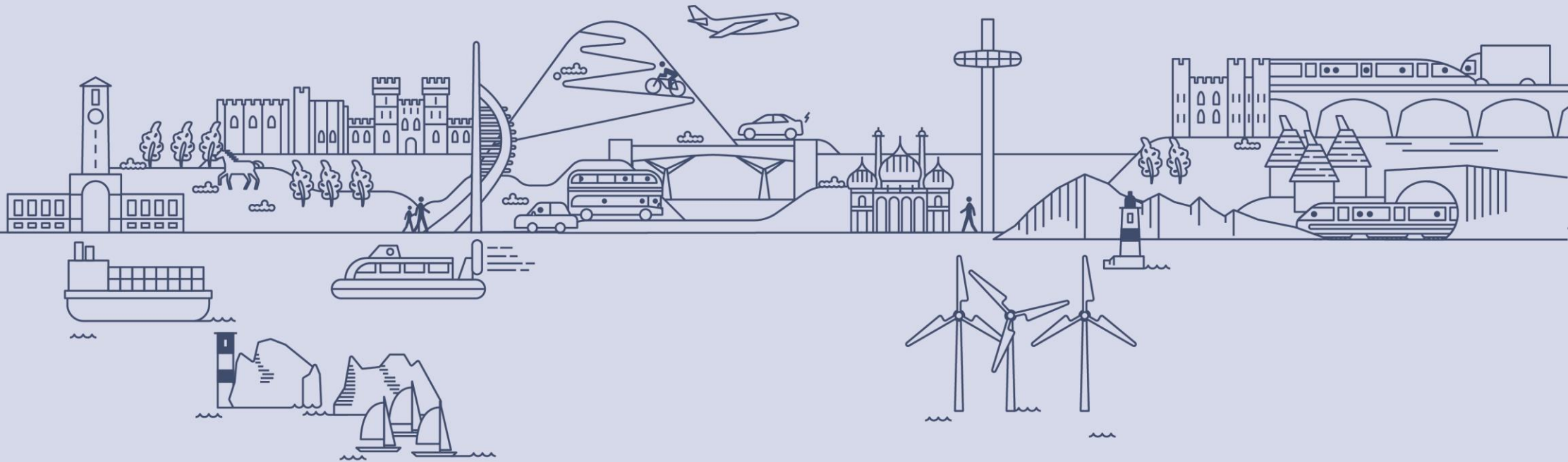
Figure 0: Area Studies programme and Strategic Investment Plan document hierarchy

Area Studies and SIP Outputs

Key to document abbreviations

SPOC – Strategic Programme Outline Case
 OAR – Options Assessment Report
 ISA – Integrated Sustainability Appraisal





Part 2: Context

Where Rail Works Best

Role of rail

Rail can transport large volumes of people quickly, safely, efficiently, and in an environmentally sustainable way. That said, rail is much less competitive for short door-to-door journeys.

Rail services are often more effective than roads for carrying concentrated flows of passengers between and town and city centres at relatively high speeds and even within dense urban areas where traffic congestion is high.

In most circumstances, passenger rail services are faster, cleaner (both in terms of carbon and air pollution), more space efficient, and safer than road transport. Their competitive advantage against the car is particularly powerful in large urban areas, where average traffic speeds are often below 10mph.

Rail is especially well suited for journeys covering longer distances. This is also true for freight, where the alternative might involve operating dozens of Heavy Goods Vehicles to deliver one train load.

Figure 1 (overleaf) illustrates some of the advantages of rail versus road.

Key advantages of rail

Key advantages of rail include:

- Passenger rail services are capable of operating at a much higher speeds (typically 90 – 125mph on mainlines in South East England) than the highway speed limits (70mph).
- Most passenger rail services in South East England are powered by electricity, which can be fully decarbonised.
- Modern railways are capable of comfortably accommodating more than double the capacity of a motorway, for a fraction of the space (see **Figure 1**).
- Rail can offer inclusive and convenient transport to the centre of cities and other key destinations such as airports for those with or without access to a car.
- Rail passengers can use their travel time more productively than if they were driving.
- Railways are the safest way of travelling on land (technically aviation is safer on a passenger-km basis) and Great Britain's railways have one of the best safety records in Europe.

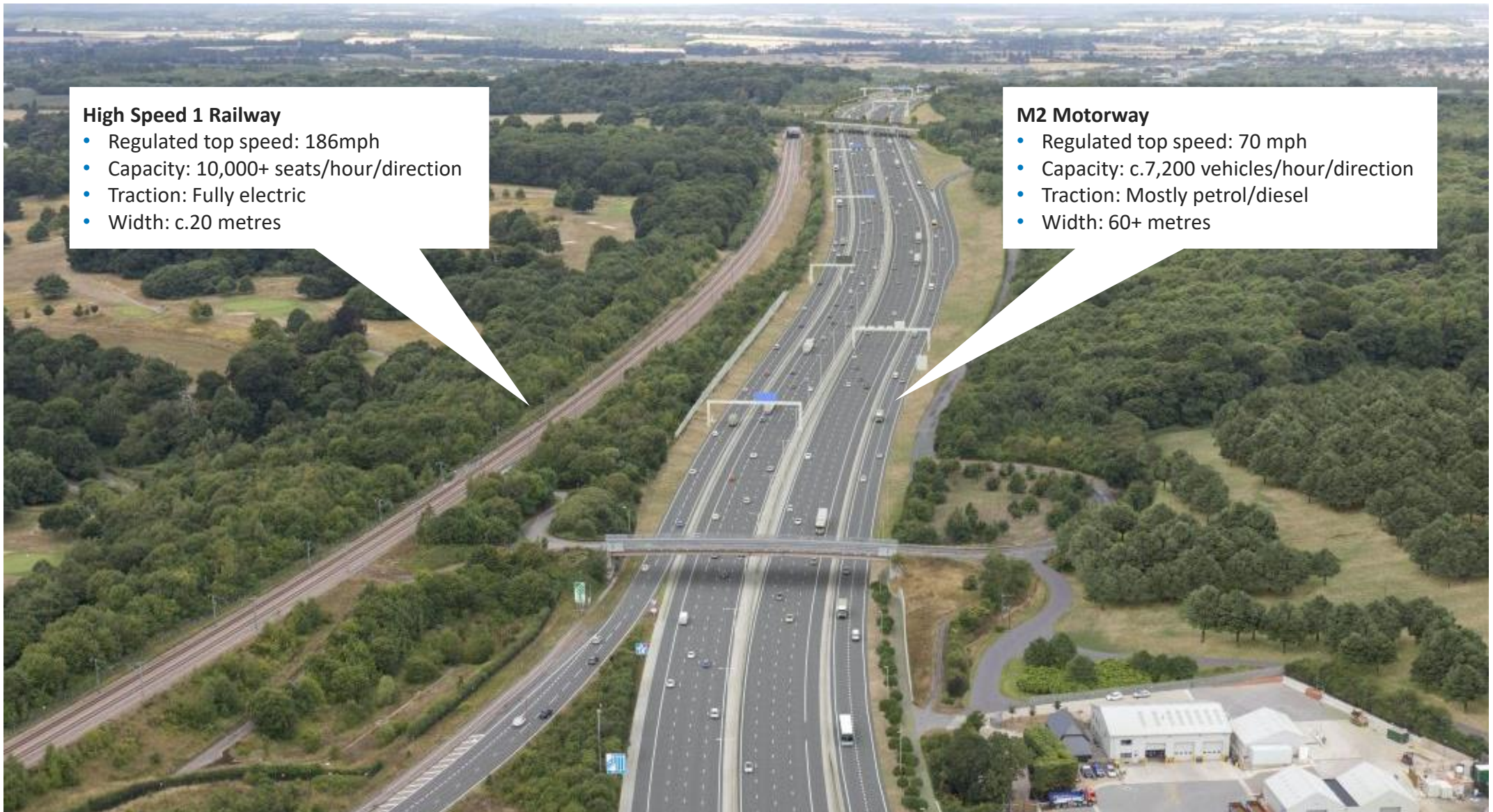
Key limitations of rail

However, it is important to understand the limitations of rail:

- Railways are expensive to build, maintain, and operate, and, because they depend on fixed infrastructure, are susceptible to disruption and can also be difficult and expensive to modify.
- The high cost of rail presents politicians with the difficult choice of balancing the cost to the taxpayer against fares levels for passengers.
- Rail is rarely able to deliver a complete point-to-point journey. This is particularly challenging for first-mile-last-mile freight traffic.
- Rail is relatively inefficient for small passenger flows and low freight volumes especially over short distances.
- Rail is rarely a viable option for very long-distance journeys (e.g., to holiday destinations in southern Europe) due to long journey times and higher costs.
- Rail freight is relatively inflexible and expensive compared to road options.

Example of Rail's Advantages versus Road

Figure 1: Comparative advantages of rail versus road (High Speed 1 versus M2 after Lower Thames Crossing Enhancements)¹



Size of the Prize

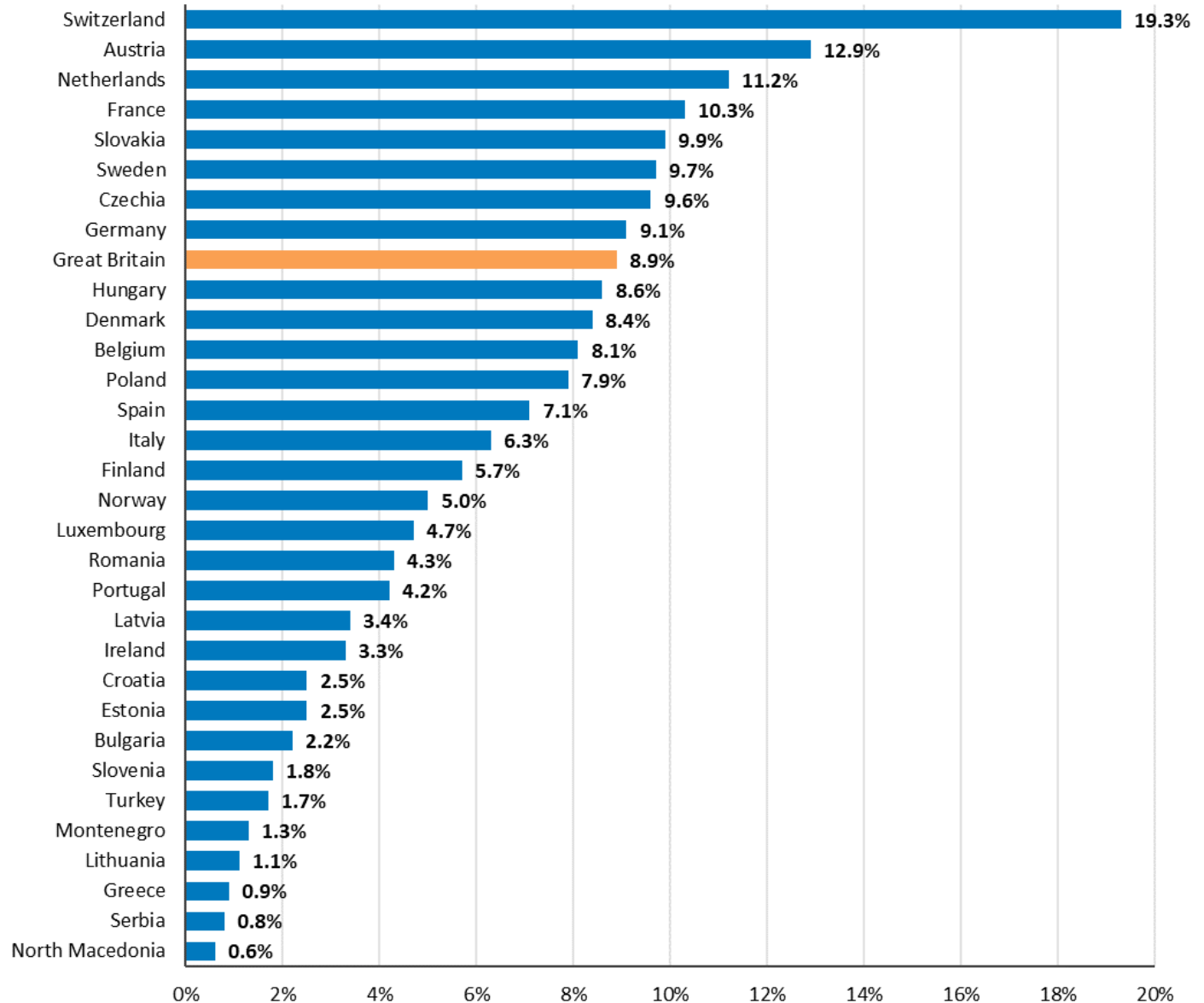
What market share is achievable?

While rail mode share in Great Britain is higher than the European average, with the right policies and investments, it should be possible to grow this mode share towards levels seen in Switzerland, Austria, and the Netherlands.

In line with most European countries, the railways in Great Britain (GB) have a relatively low mode share compared to highway transport. TfSE studies estimate around 4% of trips in the South East are currently undertaken by rail, while the rail modal share (the percentage of passenger km undertaken by train) in the GB in 2018 was just over 9%.

The GB rail mode share is higher than for many European countries, as shown in **Figure 2**, (and is above the European Union average), however it is considerably lower than some, notably Switzerland, where rail mode share is more than twice as high as GB. While each country has its own characteristics, the fact that mode share is higher in countries with similar population densities suggests there is potential to grow rail's mode share.

Figure 2: Passenger rail mode share in European Countries (2018)²



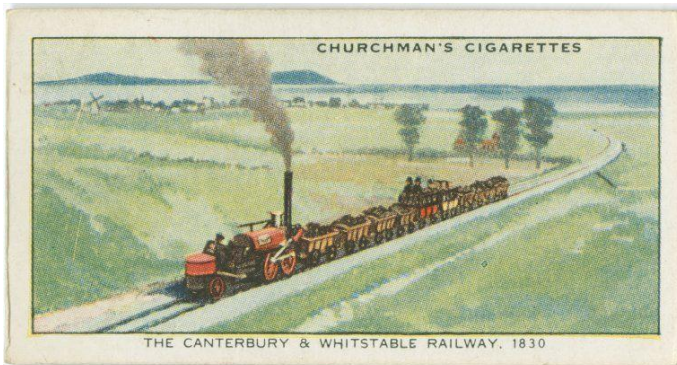
Historical Context (Pre 1945)

Earliest Railways

South East England was one of the first places in the world to build railways.

The first major passenger railway developed in the South East was the Crab and Winkle Line between Canterbury and Whitstable (Figure 3), which was led by one of the railway's pioneers, George Stephenson, and opened in 1830. During the course of the industrial revolution, the railway grew rapidly to serve just about every community in the country. Most railways were developed through private ventures, which consolidated over time into larger rail businesses. This is why some towns in the South East are served by multiple stations that do not offer easy interchange between

Figure 3: Crab and Winkle railway³



The Great Western Railway developed in different way to the rest of the network.

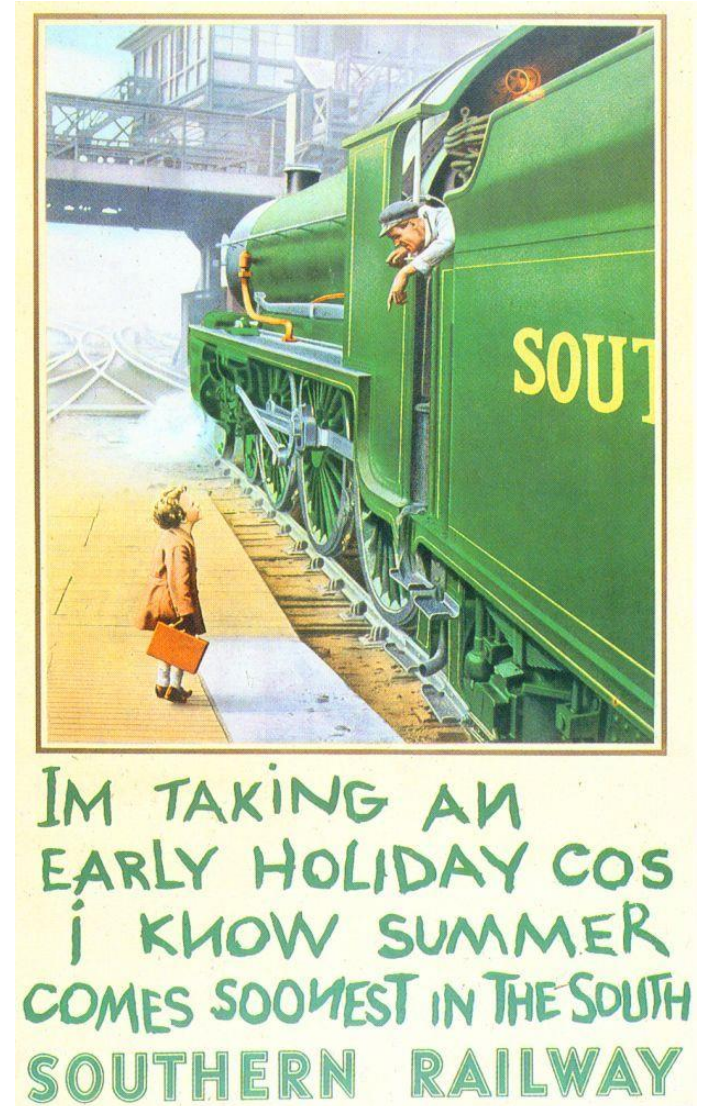
The initial mainline, which was led by Isambard Kingdom Brunel and opened to passenger service in 1838, was built to a wider gauge than railways in the rest of the country. Eventually the railway was converted to standard gauge, but differences between this part of the rail network and the rest of the South East's rail network remain today.

In 1921 the government restructured the UK rail industry into four large companies, known as the "Big Four".

Most of the railways in the South East were combined into "Southern" (see Figure 3) – a brand still in use today.

At this time, the Great Western Main Line became part of the "Great Western Railway" – another brand also in use today.

Figure 4: Southern promotional material⁴



Historical Context (1945 – 1994)

British Rail

The railways were nationalised in 1947 to create a single company for the whole of Great Britain – British Railways (Figure 5).

British Rail delivered a major modernisation programme, as well as innovations such as the 125mph High Speed Train that introduced in the late 1970s on Great Western and remained in operation until 2019.

Figure 6: Dr Beeching⁵

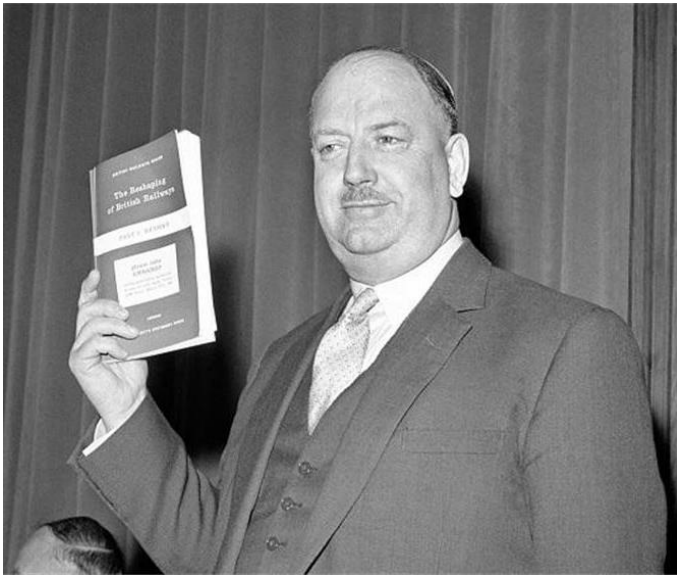


Figure 5: British Rail Logo⁶



However, for many, the British Rail era is associated with managed decline.

For much of the British Rail era, passenger rail demand declined in face of competition from the car and expanding road network. The decline in the financial performance of British Rail forced government to cut rail services. The most significant retrenchment took place in 1963, when Dr Beeching published his report, “Reshaping of British Railways” (Figure 6), which recommended the closure of 2,363 stations (nationally) and 5,000 miles of railway line – representing 55% of stations and 30% of route miles. Over the period 1963 – 1970, 4,000 miles of railway line were closed, including the Three Bridges to East Grinstead line, although the South East suffered less than other parts of the country.

In 1986 British Rail moved to a market-led model and created sub-brands focussed on intercity and regional markets.

A new business unit, “Network South East” (Figure 7) was created to serve the London and South East commuter market. A “Regional Railways” business unit was also created for other markets. While this “sectorisation” of the railway resulted in an increased focus on the passenger, its success is difficult to judge as the railway industry was privatised shortly after.

Figure 7: British Rail Sector Logos⁷



Historical Context (1994 – 1997)

Privatisation

Between 1994 and 1997, the government privatised the rail industry and attempted to shift it towards a regulated utility model similar to those developed for water and energy. The initial privatised model adopted divided roles and responsibilities as follows:

- Passenger rail services were delivered through franchises, which were let by government and awarded the winning bidder the right to operate geographically defined rail services and collect revenue from passengers. Some of these franchises received subsidies and others paid a premium.
- Freight rail services were sold and operated as commercial businesses with minimal government intervention.
- Infrastructure was transferred to a private company called Railtrack, which was listed on the London Stock Exchange and raised revenues through charging operators for use of the infrastructure. This company collapsed in 2002 and assets were transferred to Network Rail, a new and now state-owned company.
- Rolling stock was sold to Rolling Stock Companies, which were owned by major financial institutions and raised revenue through leasing rolling stock.
- A regulator (Office of the Rail Regulator – now the Office of Rail and Road) was established to act as safety and economic regulator for the industry. This role included setting charges for using infrastructure.
- The government’s role was limited to setting a strategy for the industry, setting a funding profile for improving rail infrastructure, funding larger scale interventions (e.g. construction of High Speed 1), and designing specifications for rail franchises. Some functions were devolved to regional authorities.
- These arrangements also enabled private ‘Open Access’ operators (e.g. Hull Trains) to create new services and run them on a purely commercial basis with no government support.

Figure 8 shows the key (not all) rail industry players in South East England today.

Figure 8: Current rail industry operators⁸



Historical Context (1997 – 2020)

Post Privatisation

The government initially created 11 franchises that operated in the South East, which have consolidated over time.

Table 1 shows how these arrangements have evolved since privatisation.

The railway has experienced significant growth in passengers since the railways were privatised. Figure 9 shows the extent of this growth and how it compares to other developed economies. There is much debate about the extent to which privatisation has contributed to this trend.

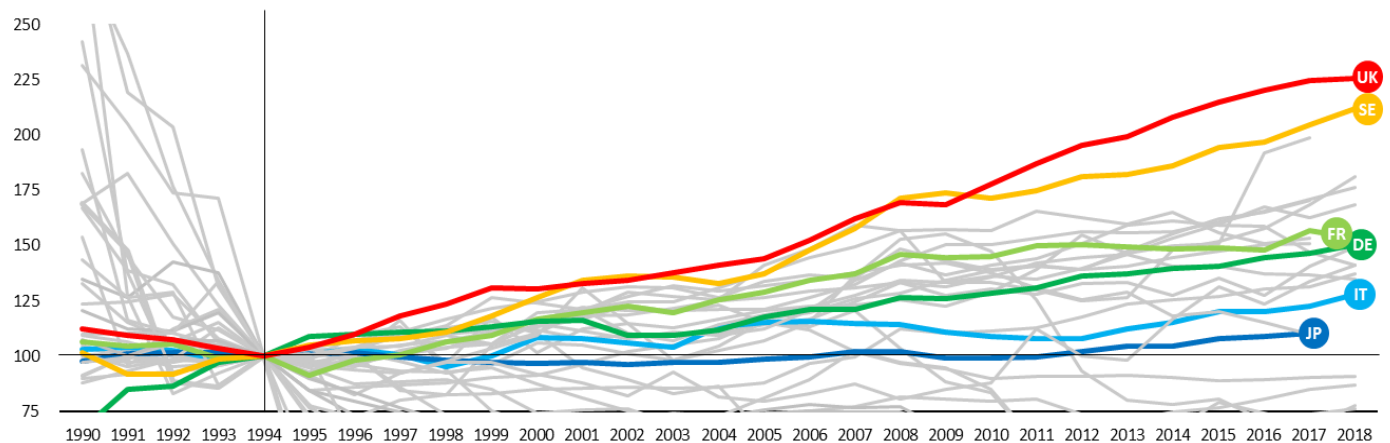
While it is likely that exogenous drivers (such as increasing population, economic growth, urbanisation, and a shift to a service-based economy with a strong focus on London) have played a role, it is striking that Great Britain’s railways have delivered higher growth than any other comparable rail system. Indeed, the only country that has delivered comparable levels of growth is Sweden, which also adopted a privatised model in the 1990s.

Table 1: Franchise development from Privatisation to current day

Market/Franchise	Original Franchisee	Today’s Franchisee
Great Western intercity	Great Western Trains	Great Western Railway (FirstGroup)
Great Western commuter	Thames Trains	
Wessex Main Line	Wales and West	South Western Railway (FirstGroup and MTR)
South Western	South West Trains	
Island Line (Isle of Wight)	Island Line	
Southern	Connex South Central	Thameslink Railway
Gatwick Express	Gatwick Express	This franchise is currently operated as the four brands listed in the first column by a single operator (Govia Thameslink Railway).
Thameslink	Thameslink	
Great Northern ¹	West Anglia Great Northern	
South Eastern Mainline/Metro	Connex South East	Southeastern (SE Trains Limited)*
South Eastern High Speed	(Did not exist in 1994-7)	
Cross Country	Virgin Cross Country	CrossCountry (Arriva)

*appointed Operator of Last Resort under Government control

Figure 9: Index of passenger rail journeys rail (1994 – 2018), 1994 = 100, OECD countries⁹



Recent Developments

Emergence of Network Rail (2001)

The privatised model has also presented challenges for the infrastructure manager.

In 2001, following a series of serious rail accidents that were attributed, in part, to poor maintenance and safety practices, the infrastructure manager (Railtrack) was placed into railway administration by the Secretary of State and was replaced with a government company (Network Rail).

Network Rail is a large organisation (over 40,000 employees) with a significant remit to plan, develop, maintain and operate the national rail network. It has recently adopted a more devolved structure based on regions, which themselves are formed of routes. The South East is served by the Network Rail's Southern Region (the Kent, Sussex and Wessex Routes) and the Western Route of Network Rail's Wales & Western Region."

Pressure on the franchising model

Despite successes, many industry leaders have placed on record their view that the franchising model has run its course.

Since privatisation passenger rail demand has grown strongly, but this has resulted in overcrowding on many trains and declining operating performance. This is partly driven by higher intensity of services on a rail network that has barely grown (in terms of track mileage) since the 1990s.

Financial risk has also become a key concern. The size of many rail franchises has grown to the extent that several are now £1bn (per annum) businesses, and private companies (representing their shareholders) have been increasingly reluctant to be exposed to this level of risk, which has resulted in less competition for rail franchises (with a consequential impact on the Treasury/ taxpayer) and the high profile failure of a number of franchises (e.g. Northern and Virgin East Coast) which contributed to a lack of confidence in the franchising system (both within and outside the industry).

Williams Rail Review (2018)

In 2018 the government asked Keith Williams to lead an independent review of the structure of the whole rail industry and the way passenger rail services are delivered. The review culminated in publishing the White Paper in May 2021 **Great British Railways: Williams-Shapps Plan for Rail** (see below).

COVID-19 Pandemic (2020 – 22)

The COVID-19 pandemic in 2020 pushed the franchising model beyond its limits.

In the first few weeks of the first UK wide lockdown, the government has announced the industry will move to a new type of contract. At the time of writing, revenues were approximately 70% lower than 2019, and most passenger rail services have moved to contracts where operators are no longer exposed to revenue risk.

Williams-Shapps White Paper (2021)

Significant changes in the structure of the rail industry are under development and are explored in the following section.

Rail Reform

Williams-Shapps Commitments

The Williams-Shapps White Paper¹⁰ commits to the following promises to passengers and freight customers.

Bring the railways back together, delivering more punctual and reliable services. A new public body, Great British Railways (GBR), will run and plan the rail network, own the infrastructure, and receive the fare revenue. It will procure passenger services and set most fares and timetables. This will bring the whole system under single, national leadership with a new brand and identity, built upon the famous double arrow. This will mark the end of a quarter century of fragmentation.

Make the railways easier to use by simplifying the “confusing mass of tickets” and introducing far more convenient ways to pay using a contactless bank card, mobile or online. There will be an end to the uncertainty about whether passengers are travelling with the right train company. Trains will be better planned with each other and with other transport services, and affordable 'turn up and go' fares and capped season tickets will continue to be protected.

Rebuild public transport use after the pandemic, by working closely with the sector on measures to enable people to have confidence to travel again and to support their new working patterns. New flexible season tickets will be introduced to begin this journey.

Maintain safe, secure railways for all. The safety and security of passengers, staff, partners and members of the public is critical. Great Britain has one of the safest networks in Europe and that must continue. Current safety and security roles will remain in place across the rail network.

Retain the best elements of the private sector. GBR will contract with private partners to operate trains to the timetable and fares it sets, in a similar way to London’s successful Overground service. The contracts will include strong incentives for operators to run high-quality services and increase passenger demand. Contracts will not be one size fits all, so as demand recovers, operators on long-distance routes will have more commercial freedom to help attract new passengers.

Make the railways more efficient. Simpler structures and clear leadership will make decision making easier and more transparent, reduce costs and make it cheaper to invest in modern ways to pay, upgrade the network and deliver new lines. The adversarial blame culture will end, and everyone across the sector, including train operators, will be incentivised to work towards common goals, not least managing costs. The value generated will be shared with the customers of the railways and the taxpayers who invest billions each year.

Grow the network: The government aims to invest tens of billions of pounds in new lines, trains, services and electrification. At a time of deep challenge for public transport, increasing flexibility and productivity will secure the future of the railways and the jobs of those who work on it right across Great Britain.

The Government has put in place a transition team (GBR Transition Team) to implement the White Paper recommendations. This team is working towards launching GBR in 2023/24.

Today's Railways

Rail Network

The South East today is served by a relatively dense rail network that is generally focussed on London.

This serves a large commuter market that (pre-pandemic) enabled an estimated 113,000 residents to commute from the South East to Central London every day. A map of today's rail network is provided in **Figure 10**. Prior to the COVID-19 pandemic, the vast majority of passenger rail services were delivered through passenger rail franchises with operators taking revenue risk. However, the Thameslink Southern and Great Northern has been run as a management contract since 2014.

Busiest Stations

The South East is home to some of the busiest rail stations outside London.

Figure 11 lists the top 20 stations in the South East by usage (using the estimated total number of entries and exits made at the station in 2018-19). The usage is split into estimated entries and exits made to each station by ticket type. Gatwick Airport was the busiest station, followed by Brighton and Reading. Of the top 20 stations, 26% of entries and exits to stations were made using full price tickets, 42% using reduced price tickets, and 32% using season tickets.

Rail journeys

In 2018/19, 314 million passenger rail journeys were generated in the South East – representing 18% of all rail journeys.

Pre-pandemic, this figure grew year-on-year, even during economic downturns. As **Figure 12** shows, most of these journeys were to/from London (just under 70%). Around a quarter of journeys stayed within the TfSE area, and the remaining journeys were to/from stations elsewhere. Although starting from a lower base, journeys to/from stations outside London and the South East appear to be growing faster (33% compared to a 2010 baseline) than other segments.

Figure 11: Station usage by ticket type (2018/19), thousands¹¹

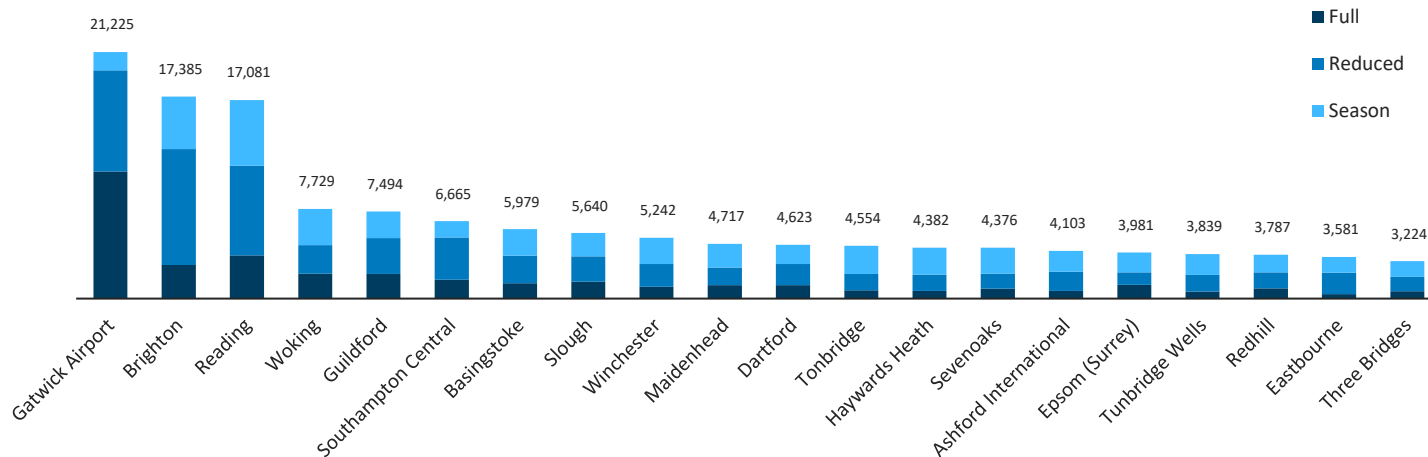
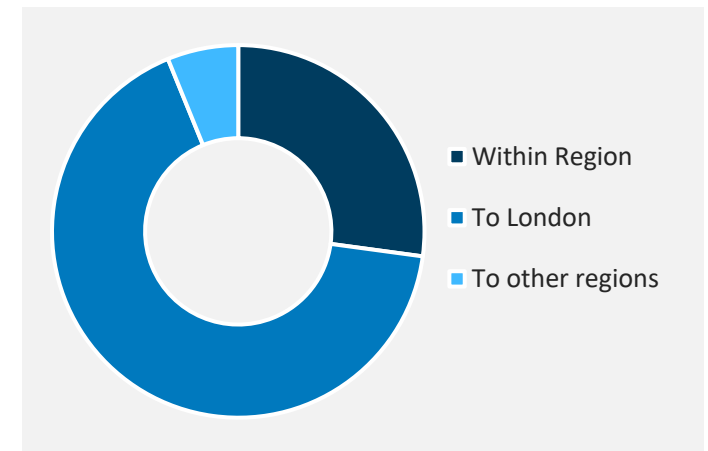
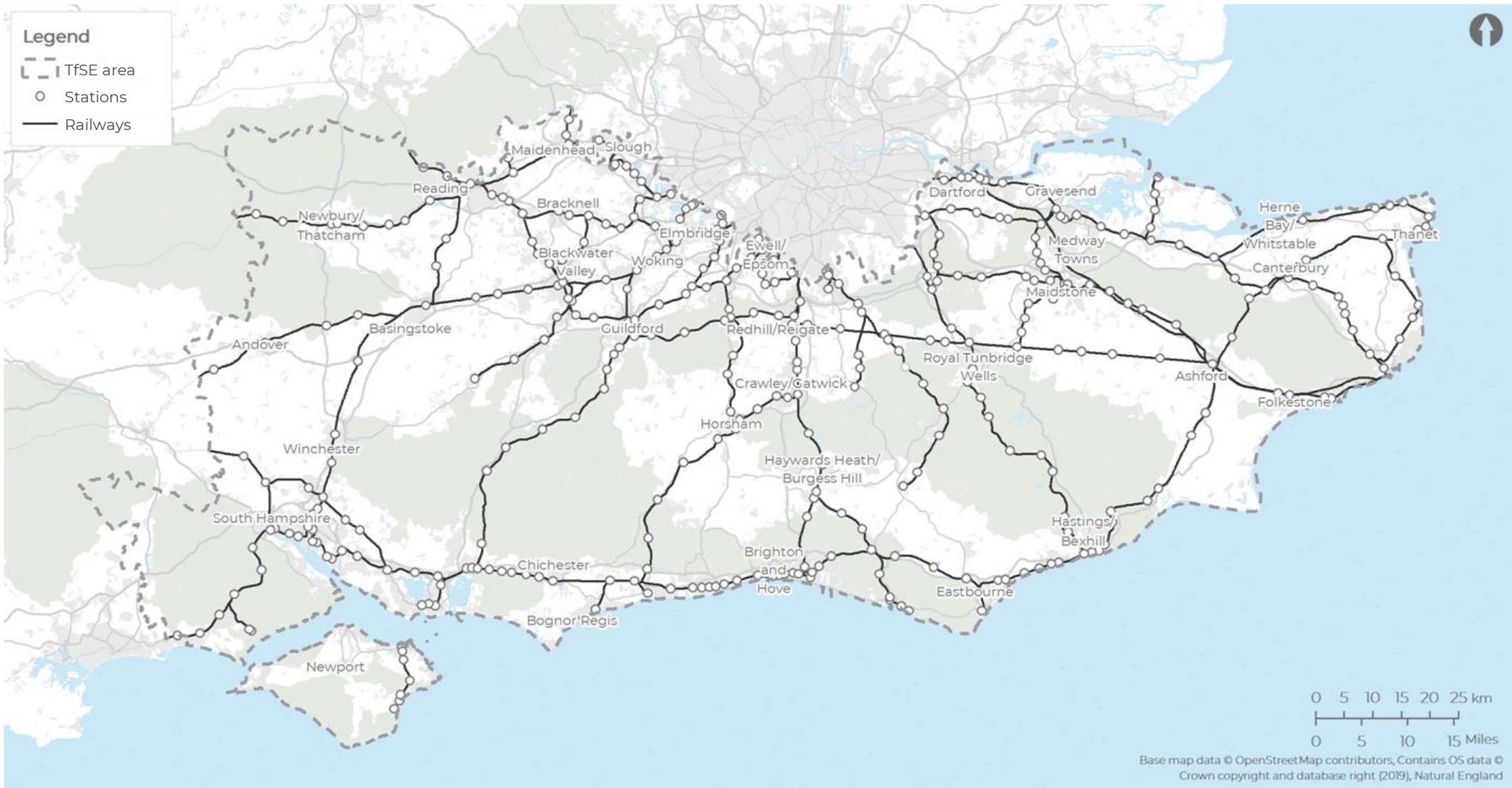


Figure 12: Journey segments (2018/19)¹²



South East Rail Network Map

Figure 10: The South East's current rail passenger network



Adapting to a post pandemic world

The COVID-19 Global Pandemic has transformed travel patterns on the South East's rail network.

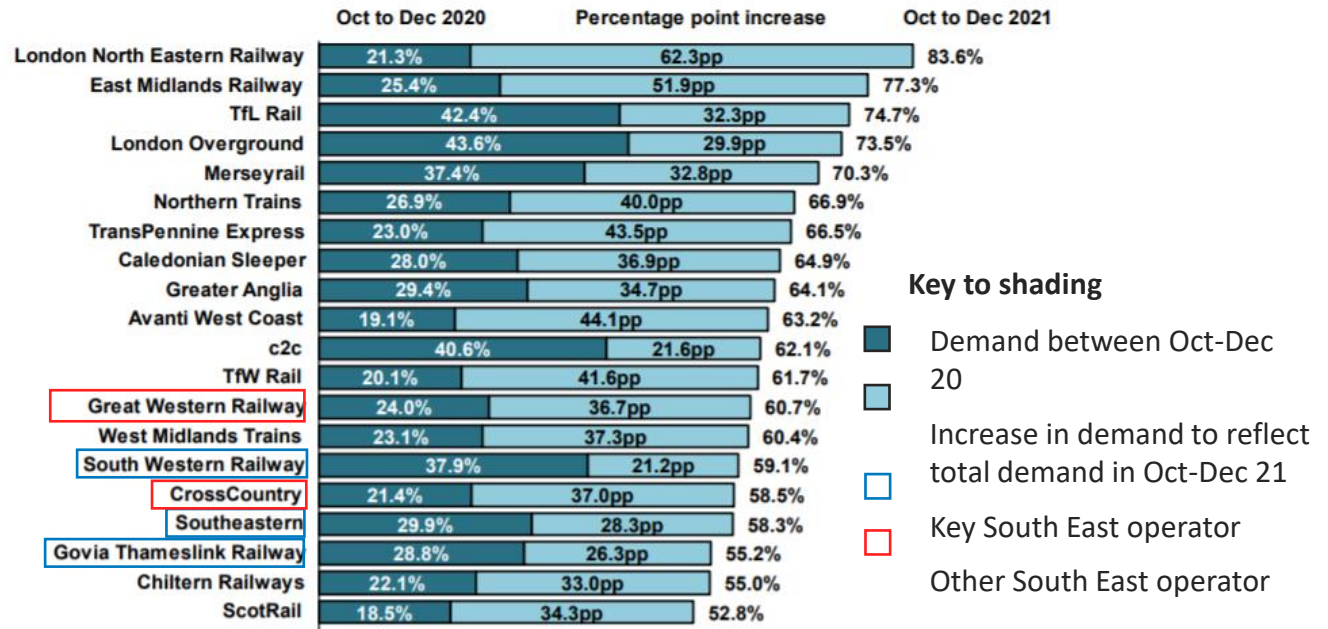
In October 2021, commuter demand was at 45% of pre Pandemic levels.

The leisure market has recovered much faster, with leisure demand at 90% of pre-pandemic levels. As

Figure 13 shows, the South East's (historically commuter-led, London-focussed) services are recovering at a slower rate than elsewhere.

It should be noted that commuter frequency was already in decline before the pandemic as working from home has progressively increased in popularity (but with limited impact on revenue as commuters continued to purchase season tickets and other travellers providing a higher yield per passenger). However, the pandemic significantly boosted this trend, with commuting for office-based work lagging sectors with a need for on-site work. Regional operators, with less reliance on office-based commuting, have seen stronger recovery.

Figure 13: Passenger demand by Operator (% compared to pre-covid)¹³



The long-term effect on commuting from the South East is unclear. Whilst demand may be lower now, in the future there may be an increase in people relocating to the South East from London, adding commuter/business trips as they do so. This could bring benefits to the South East by boosting its 'native' economy but will also place more pressures on an already overstrained housing market and road network.

A flatter demand profile across the day may also enable the industry to reduce some peak capacity (and associated operating costs) and focus on other segments (e.g. freight, longer distance leisure journeys with higher yields). Peak hour demand, albeit on fewer days of the week as commuting frequency reduces, is unlikely to be significantly reduced as a result of the pandemic.

However, there is no escaping the fact that the railway's finances are under extreme financial pressure. It is increasingly hard to make the case for investing in the South East's rail network in the short term, and there are already signs that schemes in the South East that were under development pre-pandemic may now be delayed. For now, the focus of efforts will need to be on revenue recovery and developing new markets.

Past Investment

Recent Investment

Prior to the pandemic, the South East's railway experienced significant growth in patronage and revenue. In many places, this growth was matched (or indeed stimulated) by additional rolling stock and infrastructure capacity. Recent investments include:

- **High Speed 1 (HS1):** HS1 is (currently) the UK's only purpose built high speed railway. It was developed initially to link the Channel Tunnel to Central London. However, it also supports Southeastern High Speed domestic services, which have delivered transformational reductions in journey times, particularly in North West and East Kent. It is also extremely resilient, and rarely disrupted by weather events. HS1 is estimated to have contributed £4.5bn economic benefit to the UK since it was opened for international services in 2003 and for domestic services in 2009.
- **New rolling stock:** Virtually every part of the railway in the South East has benefitted from new and/or refurbished rolling stock. The next fleets due to be replaced are the older "Networker" fleets serving Kent, and older South Western Railway / Southern rolling stock serving South West and South Central London.
- **The Great Western Route Modernisation programme:** This programme included a £850m Reading Station Area Redevelopment, electrification of the mainlines between London and Newbury and between London, Bristol Parkway and Cardiff, and the delivery of three fleets of new electric and bi-mode trains replacing 30-40 year old trains. The Programme has delivered additional train capacity, more seats, faster journeys and improved performance.
- **The Thameslink programme:** This programme planned to deliver 24 trains per hour through central London and link a wide range of locations north of the Thames to the South East. This route now provides direct services between stations north of the Thames and multiple destinations in Kent, Medway, Surrey, Brighton & Hove, and West Sussex. The redevelopment of London Bridge (opened in 2018) has increased capacity and delivered a much more attractive environment.
- **The Brighton Main Line Improvement Project:** This project forms part of a £300m government-funded programme to boost infrastructure resilience along the London to Brighton corridor. This investment will be focussed on the sections of route between Three Bridges and Brighton/Lewes and aims to improve performance and resilience on the railway.
- **Other schemes:** Other recently delivered improvements includes the re-signalling of the Lewes – Seaford Line, improvements to track between Barnham and Havant, and level crossing replacements. There have also been several station improvements in recent years, including the construction of a £26m new station for Rochester, which opened in 2015.

Future Investment

Current Projects and Future Investment

Investment in rail in the South East currently underway or expected within the next 10-20 years includes:

- **More new rolling stock:** Replacement rolling stock has been ordered for the South Western Railway.
- **Crossrail (officially known as the Elizabeth Line):** The central section of Crossrail project opened on 24 May 2022. Initially services are operating between Paddington and Abbey Wood only, but eventually the full Crossrail network will deliver cross-London services linking Abbey Wood and Shenfield in the east with Reading and Heathrow in the west. Connections with the North Kent line at Abbey Wood will significantly reduce journey times between North West Kent and central London, Heathrow and the Thames Valley.
- **Western Rail Access to Heathrow:** Network Rail has developed detailed proposals to construct a new spur between Reading and Slough to Heathrow Airport Terminal 5. This would provide fast, direct rail access to the airport from the local area and improve access to the airport by rail from the West and the Thames Valley.
- **Croydon Area Remodelling Scheme:** The project is to remove a major bottleneck on the Brighton Mainline by expanding East Croydon station, remodelling the complex network in the “Selhurst Triangle”, re-building Windmill Bridge junction, and improving Norwood Junction station. This would improve performance on the Brighton Mainline and connecting routes, allow timetable enhancements and provide capacity to meet demand growth and strengthen resilience.
- **The South East Upgrade:** Network Rail is investing £1.25bn in upgrading track, signalling, embankments, structures, stations and depots in Kent and South East London. This programme includes the now completed signalling renewals on the Greenwich and Blackheath lines.
- **High Speed 2:** While HS2 infrastructure lies just outside the South East, it will unlock opportunities (and capacity) for significant improvements in connectivity to the North and Midlands.
- **North Downs Line:** This line will soon benefit from an increase in frequency from two trains per hour to three. This service will be operated with refurbished “tri-mode” rolling stock, which will operate under electric power on the electrified parts of this line.
- **Reopening closed lines and services:** In 2019 the government launched its “Restoring Your Railway Fund” and called on local stakeholders to put forward proposals to re-instate axed local services and restore closed stations. Proposals to reopen railways on the Isle of Wight, the Isle of Grain and the Fawley line have been short listed for future development.
- **Stations investments:** These include a £150m redevelopment of Gatwick Airport station (due to complete in 2023) (providing capacity and passenger experience improvements) and a new station at Thanet Parkway, near Ramsgate (to open in May 2023).

Conclusion

Rail has a big role to play

Rail has an important role to play in helping TfSE deliver its strategy.

Rail can transport large volumes of people quickly, safely, efficiently, and in an environmentally sustainable way. That said, rail is much less competitive for short door-to-door journeys.

While rail mode share in Great Britain is higher than the European average, with the right policies and investments, it should be possible to grow this mode share towards levels seen in Switzerland, Austria, and the Netherlands (**Figure 14**). This will help the South East achieve a more sustainable transport system, fit for the 21st century.

Figure 14: Dutch Train



Great British Railways

The GB rail industry is currently implementing significant industry reform

The Williams Rail Review and Williams-Shapps White Paper have launched the GB industry into a period of significant structural reform, which will include:

- Replacing franchises with new Passenger Service Contracts (where government takes revenue risk);
- Establishing a new, public, national body to be known as Great British Railways – sometimes termed a “guiding mind” – to lead the GB rail industry and manage the new contracts; and
- Simplifying fares and ticketing.

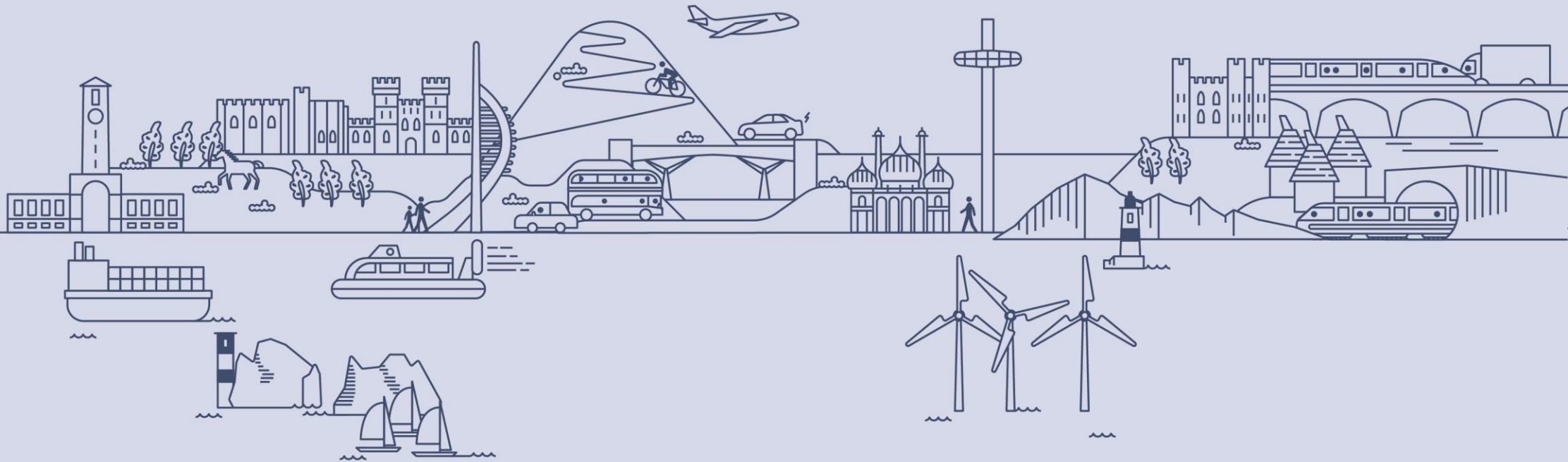
The rail reform agenda represents a once-in-a-generation opportunity to fundamentally reshape the structures and incentives of the GB rail industry to align intuitional priorities, address the fragmented structure of the industry, and put the customer at the heart of the industry. It also offers room for greater engagement with regional and local government in designing and delivering passenger rail services.

The industry’s finances are stretched

The rail industry is facing unprecedented financial challenges

The COVID-19 pandemic has placed significant stress on the rail industry’s finances. At the time of writing, patronage was around 70% of pre-pandemic levels¹³ and there remains much uncertainty about the pace of rail demand recovery and how future travel patterns will develop. The reduction in revenue is unlikely to be mirrored by midweek peak capacity requirements.

The South East has benefitted from significant investment over the last 20 years, including HS1, Thameslink, Crossrail and Great Western modernisation. However, future funding will need to reflect the railway of the mid 2020s which may see a significantly different demand profile than it did only a few years ago. Short term priorities are likely to focus on restoring stability to industry finances while supporting the government’s decarbonisation and levelling up priorities. For the longer term, planning needs to balance optimism in looking at potential new markets with avoiding over-committing capacity that obstructs feasible growth in existing core markets.



Part 2: Issues and Opportunities

The key issues affecting the rail network in the South East are summarised below:

Affordability: Regular, peak-time travel on the South East's railways is seen by many as increasingly unaffordable – with good reason (**Figures 15 and 16**). The railway needs to provide better value for money, simplify fares, and offer passengers more flexibility.

Capacity: Prior to the COVID-19 pandemic, over-crowding was a significant problem on some services and some corridors (**Figure 17**). There are several options for expanding/managing capacity on each corridor depending on the context of each area.

Key constraints include:

- London Bridge, Waterloo, St Pancras terminus platform capacity.
- South Western Main Line (e.g. Woking, Basingstoke, Clapham Junction).
- Brighton Main Line (e.g. Croydon).
- South Eastern Mainline (e.g. Chislehurst Junction – Tonbridge).
- Southampton Central and tunnels.
- Chatham Main Line (Rochester Bridge).
- Several level crossings (Totton, West Worthing, Reigate, Canterbury).
- Traction power supply across the region

Connectivity: East-west connectivity in the South East is materially poorer than radial services in terms of journey times (**Figure 18**) and service frequencies. In the shorter term, minor changes to operations and timetables could deliver connectivity boosts through reducing interchange times (e.g. between east-west services at Redhill) and through utilising capacity released by changes in travel patterns to run faster/more direct services (e.g. through reinstating long distance Cross Country services to Brighton).

Accessibility: While there has been good progress in improving accessibility for people with mobility impairments in recent years, significant issues remain. Accessibility in the broadest terms is a key barrier to many users. The Williams Rail Review identified this is a key challenge for the rail industry. The DfT's "Access for All" programme has unlocked some investment in some rail stations, but there is much more scope to go much further.

Performance and resilience: this covers both operational and physical resilience. If operational performance declines (as it has in recent years), then there is a risk people will feel they cannot trust rail as a mode of transport. The physical resilience of the rail network is also under threat from climate change. Planned infrastructure investment at capacity bottlenecks and vulnerable sections of the network should improve operational resilience and operating performance, but service and contingency planning will also play a role.

Integration: Better integration between modes would increase demand for travel by rail. While London is a model for integration between modes, it will need effective liaison between planning and transport authorities to replicate this across the South East. Organisations such as Transport for the North and Solent Transport are already developing plans to improve rail integration and there are undoubtedly innovative approaches that TfSE could use to do so, alongside working with local councils to identify potential funding sources.

Figure 15: Annual season ticket fares, including London Travelcard fares (2015)¹⁵



Figure 16: Examples of the relative cost of South East Annual season ticket fares in 2019¹⁶

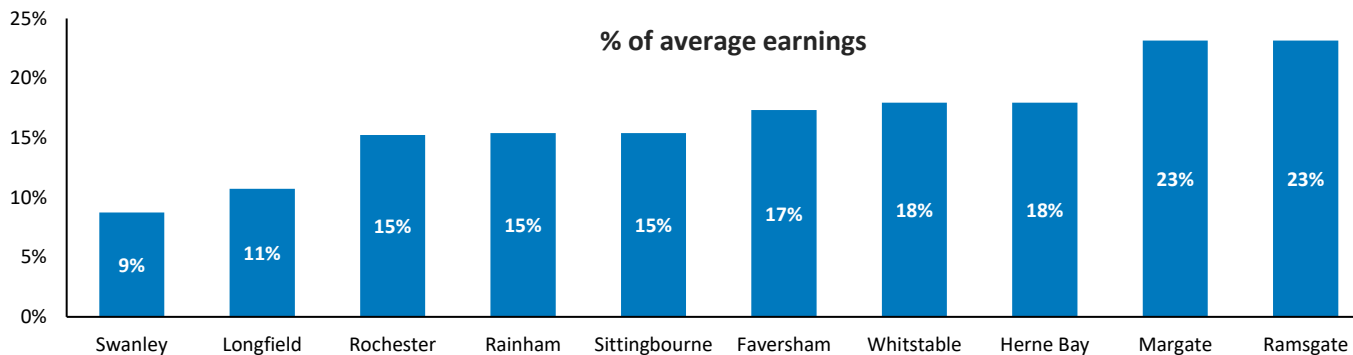


Figure 17: Most crowded trains¹⁷

The top ten most crowded passenger rail services in Great Britain (2019)

#	Service	South East?
1	08:02 Oxford to London Marylebone Chiltern Railways	
2	07:32 Woking to London Waterloo South Western Railway	Yes
3	07:38 Enfield Town to London Liverpool Street London Overground	
4	15:08 Weymouth to Gloucester Great Western Railway	
5	18:30 London Waterloo to Portsmouth Harbour South Western Railway	Yes
6	05:50 Wolverhampton to London Euston West Midlands Trains	
7	05:43 Portsmouth Harbour to London Waterloo South Western Railway	Yes
8	07:14 Alton to Waterloo South Western Railway	Yes
9	07:29 Chingford to London Liverpool St. London Overground	
10	07:16 King's Lynn to King's Cross Great Northern	

Opportunities

The key opportunities relevant to the rail network in the South East are described below:

Carbon: Rail is widely recognised as a more carbon efficient mode for moving passenger and freight¹⁹. While much of the South East rail network is already electrified, there remain many gaps (**Figure 19**) and as a result some passenger services continue to operate with diesel traction (e.g. London-Uckfield). Filling gaps will ensure the railway can reach carbon neutrality as soon as possible, while also helping improve the cost and operational efficiency of the railway (by eliminating diesel operations).

Most of the network within the South East is electrified with a legacy 750V DC third rail collection system. The modern industry standard for new electrification uses the 25kV AC overhead line collection system. However, it would not be practical or cost effective to use this overhead line system for infilling most of the gaps in the third rail electrified network within the South East. The RSSB has been conducting research into alternative technical solutions for infilling gaps in the legacy third rail electrified network. The outcome of that work is currently awaited.

Freight: Rail freight has a role to play in supporting sustainable economic growth by providing a clean and efficient way of moving freight that would (likely) otherwise be transported on congested highways. There are encouraging signs of growth in this sector, which appear to have accelerated through the pandemic, and so this area should be a promising and attractive sector for investment. When HS2 and East-West rail come online later this decade, further opportunities to grow freight up the spine of Great Britain could be unlocked.

Non London markets: Whilst rail has a relatively high mode share in the South East region for travel to and from London, it has a much lower share of the non-London travel market. This represents an opportunity for passenger rail throughout the region. Projects to improve capacity and journey time can also potentially serve to improve connectivity for both London radial and non-London markets such as better links for coastal towns. There is also a region-wide opportunity to improve connectivity through improving integration between rail and active travel modes, for which Community Rail Partnerships could play a key promotional role.

Opportunities

Key opportunities for rail network in the South East, continued:

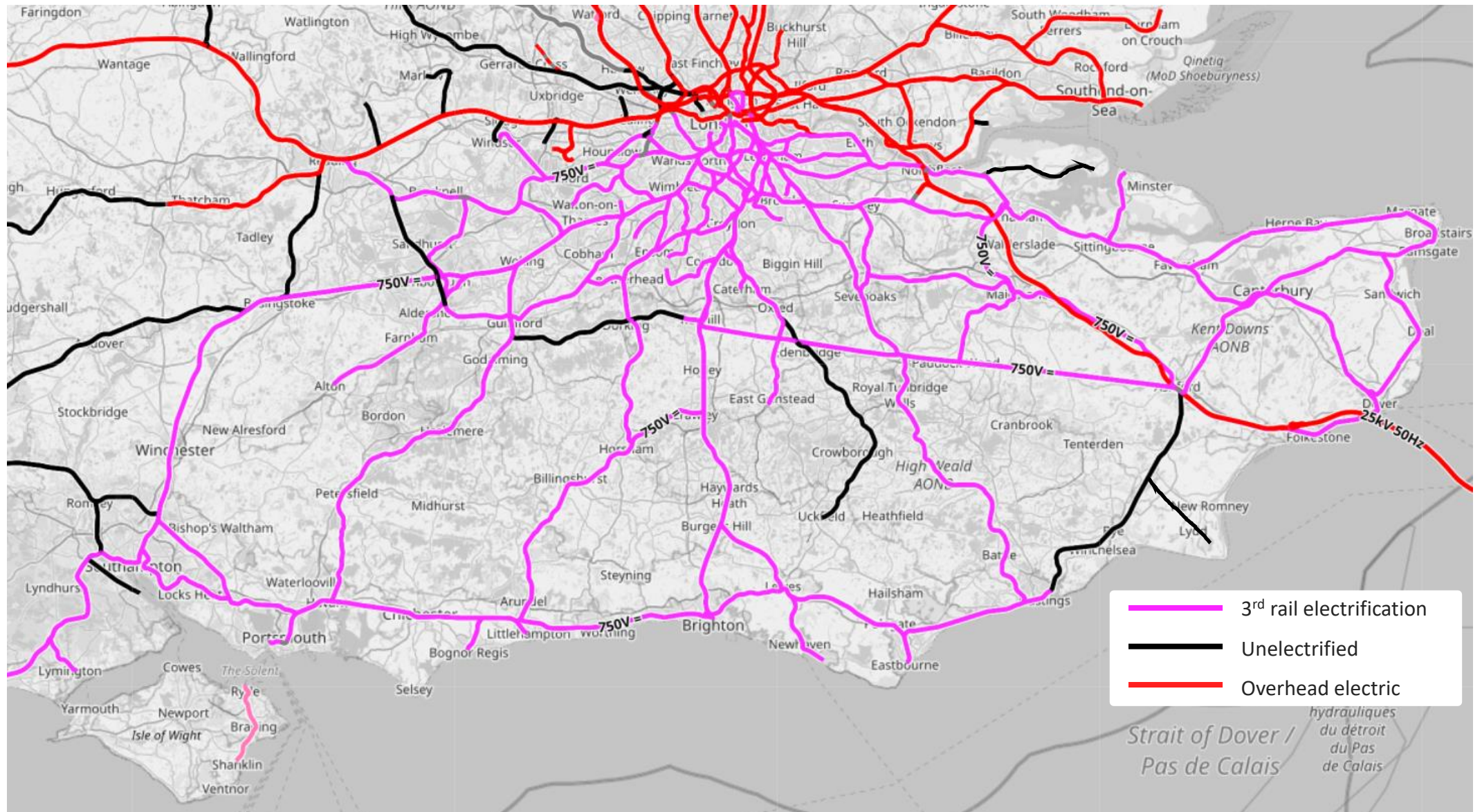
Global Gateways: Direct rail services to Heathrow Airport from the West and South would significantly improve public transport access to this key international gateway and help reduce congestion on the South West quadrant of the M25. Improved rail access to Gatwick from Kent would also relieve pressure on the road network. Southampton Airport is expanding, and rail is well placed to serve this growth. Significant growth is planned for the Port of Southampton, which is expanding across the Test Estuary on the Fawley/Waterside area of the New Forest District. This area is already served by a freight railway, which can be enhanced to accommodate more passenger and rail traffic. There are also opportunities to grow rail freight between Portsmouth, Newhaven, and the Channel Ports to the rest of the UK.

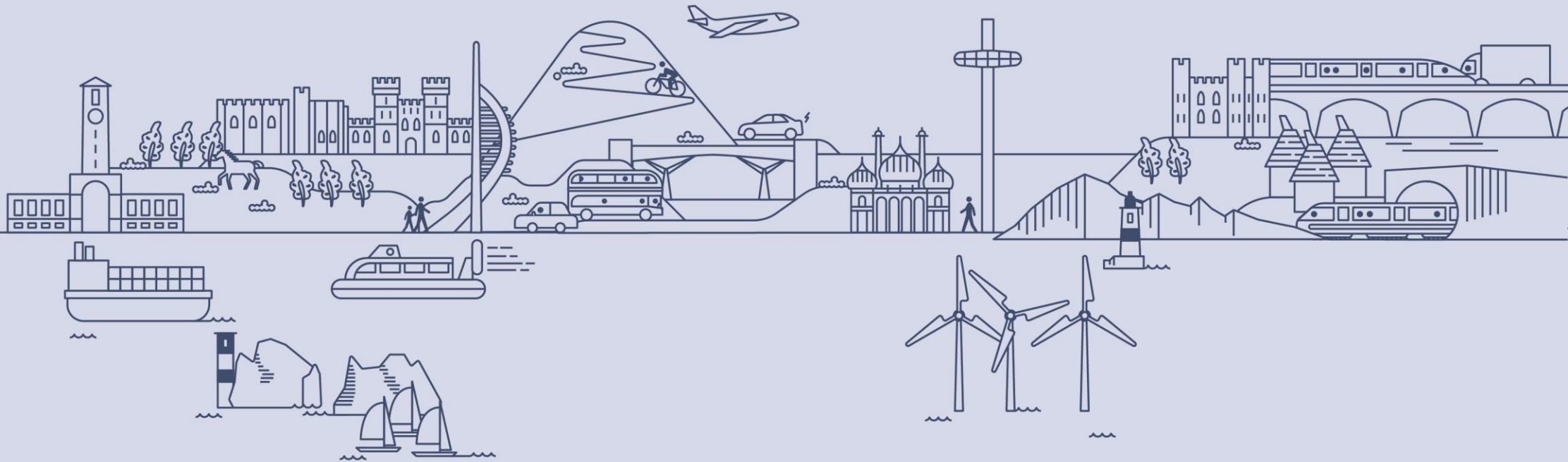
Devolution: There may be opportunities to reconsider the franchise map in light of the wider rail reform and devolution agendas. This could support local initiatives to integrate rail and bus services at a City/Region level and enable more seamless travel experience across different modes of transport.

In addition, this could align with the objectives and recommendations of the Williams-Schapps Review, and early indications made by GBRTT's ways of working and engaging with Sub-national Transport Bodies.

Technology: Advances in technology will enable rail to fully contribute to TfSE's objectives, and many are already in use or being tested. These include contactless payment, alternative sources of traction power, new signalling systems (to increase the capacity of the network) and improved on-train Wi-Fi (making time spent on trains productive). Innovation in Mobility as a Service (MaaS) may also facilitate growth in rail demand, although there are risks that such technologies could undermine public transport and increase road congestion.

Figure 19: Current rail electrification¹⁸





Part 3: Vision and Objectives

Vision and Objectives

TfSE Strategy

The vision and objectives for the South East’s railways are designed to align and support the wider vision and objectives set out in TfSE’s Strategy and Area Studies.

The vision for the railways reflects the TfSE Transport Strategy Vision, which is presented below:

“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.”

Area Study Objectives

The key objectives emerging from the Area Study Programme are centred around an ambition to deliver a transport system that:

- Enables a more prosperous, resilient, and equitable economy.
- Delivers better socioeconomic outcomes, especially in deprived areas.
- Protects the natural and historic environment.
- Achieves the UK Governments goal of Net zero carbon emissions.
- Improves safety for all highway users.
- Improves health and wellbeing.
- Promotes sustainable housing and employment growth.
- Unlocks regeneration opportunities, especially in coastal communities.
- Strengthens the resilience of the transport system and economy.
- Delivers high quality connectivity for freight, especially between the South East’s international gateways and the rest of the country.

Need for Intervention

Without intervention, the railways will struggle to keep up with emerging technologies, which may yield less sustainable travel outcomes overall.

Rail mode share could decline, feeding a spiral of escalating costs and industry decline. This will result in less sustainable travel and financial outcomes. Less well connected communities will continue to be isolated and will struggle to “level up”.

Furthermore, there is a risk that the railways could enter into a “cost spiral”, whereby tactical cuts around the edges of the timetable result in a decline in network demand (as seen during the British Rail era) which fuels further calls to reduce services.

Given the role the railway could play in enabling sustainable economic growth and decarbonising the wider transport system, a “cost spiral” scenario would run contrary to stated government goals.

Strategic Narrative

Strengths

The Strategic Investment Plan sets out a Strategic Narrative underpinning the case for investing in the South East.

This narrative starts by highlighting the key strengths of the South East, including:

- a highly productive economy;
- a highly educated workforce;
- strong links and access to London;
- strengths in Financial/Professional Services, Advanced Engineering/Manufacturing, IT, Marine/Maritime, Defence, Transport/Logistics, Tourism, Low Carbon, and Creative Industries;
- several national and world leading universities;
- a favourable investment environment;
- available land for regeneration and development;
- a varied and highly valued natural environment; and
- a rich cultural and historic environment.

Challenges

The South East faces several challenges and threats, which in the Strategic Narrative are grouped into eight themes.

The first four focus on broader issues where action is required across multiple sectors:

- **Decarbonisation** of the transport system is not happening fast enough.
- The South East's transport systems need to adapt to a **new normal**- i.e. post pandemic, post Brexit environment.
- There is a need to **"level up" left behind communities**.
- There is a need for sustainable **regeneration and growth**.

The second group of these four themes have a more direct relevance to transport:

- The South East's largest conurbations lack **world class urban transit systems**.
- **East – West Connectivity** is poor.
- Radial Corridors lack **resilience** in places.
- There are gaps and vulnerabilities in the networks that provide serve **Freight and Global Gateways**.

Role of Rail

The rail network can play a significant role in addressing the eight key challenges highlighted in the Strategic Narrative.

- Rail is a low carbon mode of transport that can support decarbonisation by attracting motorists to rail.
- Rail freight can support new trading patterns arising from new UK-EU trade arrangements.
- Rail can improve connectivity for left behind communities.
- Rail can unlock growth in areas where regeneration is held back by poor access.
- Rail can form part of a world class urban transit system.
- Rail can deliver better east – west connectivity.
- Rail corridors can become more resilient.
- Rail can support access to global gateways for passengers and freight.

Part 4 outlines Packages of Interventions that have been designed to address the challenges listed above.

Problem Statements

A Bottom-up approach for identifying key issues

The Area Study Programme identified specific problems (weaknesses and/or challenges) that many stakeholders wish to see the Strategic Investment Programme address.

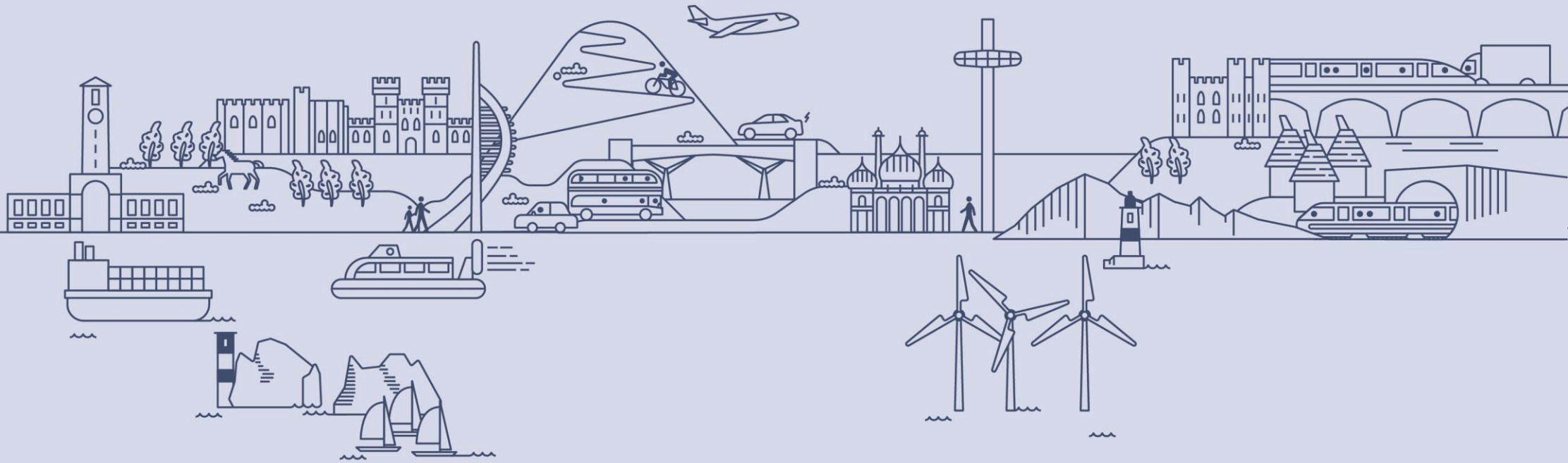
Some of these problem statements refer directly to the rail network, while others are broad but could still be relevant to the rail network. A list of the key problem statements that could be addressed (at least partially) through rail network interventions is provided below.

Global Problem Statements

- Transport is not decarbonising fast enough.
- Climate change threatens the resilience of transport networks.
- Freight is heavily reliant on highways, especially for first-mile-last-mile deliveries.
- Numerous parts of the South East have unacceptably poor socioeconomic outcomes.
- Demand for public transport has been negatively affected by COVID-19.
- Some parts of the South East appear to be too reliant on a small number of industrial sectors.
- The economic influence of London dominates many areas in the South East.
- Housing affordability presents a barrier to achieving social equity objectives.
- There is a recognised need for housing – but in the right places, supported by the right infrastructure, planned to deliver sustainable transport outcomes.
- The benefits of new technologies are not accessible to everybody.
- We need better coordination between land-use and transport planning.
- Rural communities are being left behind in digital, active travel, and public transport connectivity.
- Too many transport services and networks are inaccessible to all users.
- For many people, public transport fares are too high and too complicated.

Rail Specific Problem Statements

- East – west rail connectivity (journey times and frequency) is poor, especially compared to radial rail services.
- Rail capacity is insufficient to accommodate the competing needs of long-distance passenger, local passenger, and rail freight customers.
- The Marshlink railway is inadequate to meet future aspirations for stakeholders.
- Resilience is relatively poor on radial routes.
- Spare capacity is limited on many radial routes and the allocation of this capacity does not meet the needs and/or aspirations of all the area's stakeholders.
- Rail capacity allocation has prioritised radial journeys over orbital trips.
- Connectivity is relatively poor for communities that live off radial routes.
- Level crossings present capacity limitations for rail and cause delay to road users.
- Infrastructure constraints are a barrier to more freight being carried by rail.



Part 4: Packages of Interventions

Introduction

TfSE has worked with key stakeholders and technical advisors to develop seven coherent Packages of Interventions that aim to deliver TfSE’s vision and objectives for the South East’s railways.

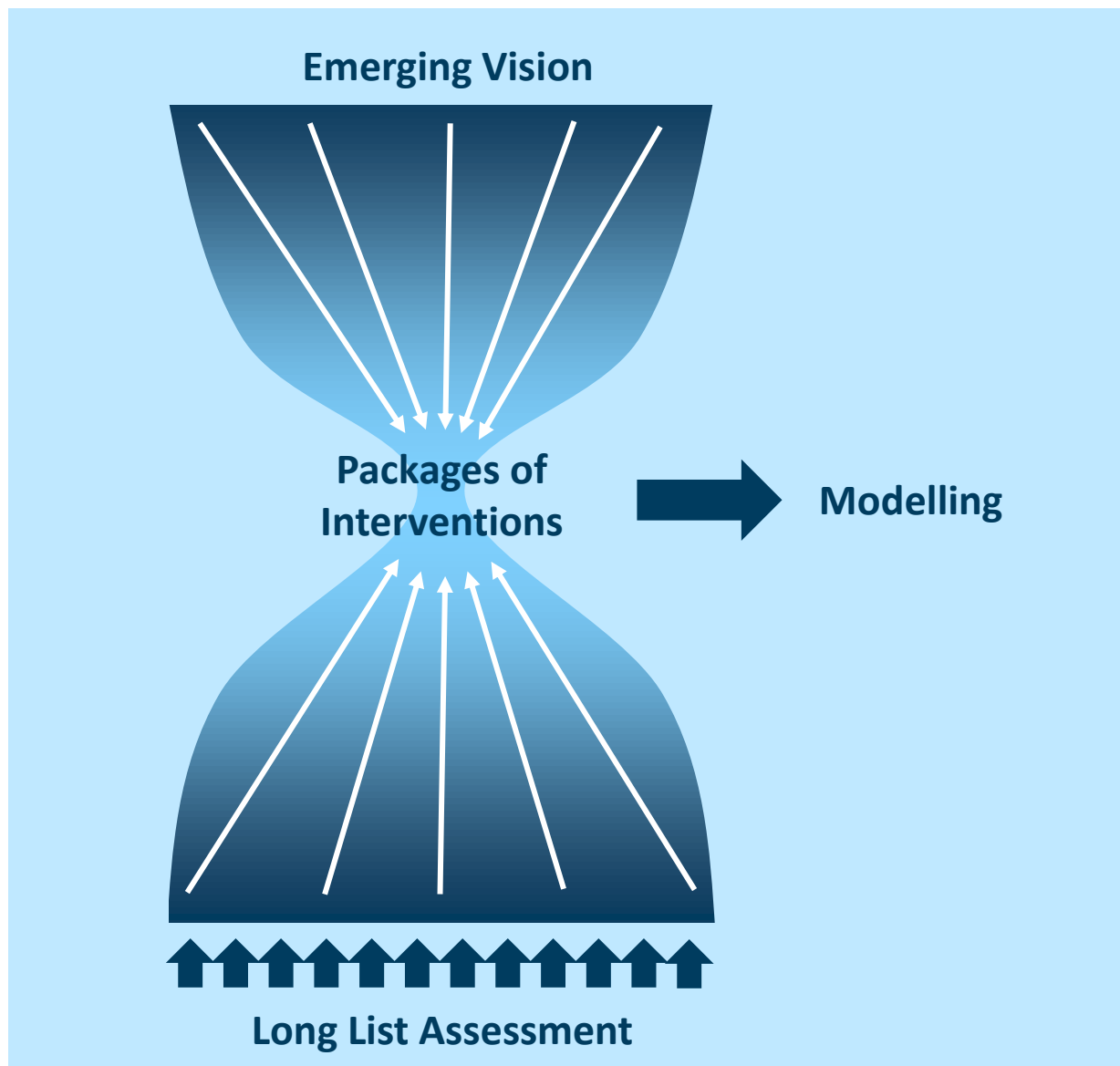
These Packages have been developed through workshops, discussions, and careful analysis of results of the assessment of the long list of interventions described earlier.

The Packages combine an overarching vision for the Area Studies with the results of the Multi Criteria Assessment Framework.

In essence, this reflects both a ‘top down’ i.e., vision led approach and a ‘bottom up’ i.e., individual intervention assessment approach. **Figure 20** illustrates the essence of this combined approach.

TfSE has used a land use and transport interaction model to simulate the impacts of these Packages of Interventions. The results from this modelling exercise are presented in **Table 2** in **Part 5**. However, some outputs are presented on **pages 34 – 40**.

Figure 20: Approach to Package development



Packages of Interventions

The Area Studies Programme has identified the following **seven Packages of Interventions** for the rail network. The Interventions included in these Packages are presented in the following eight pages.

Package A: South Hampshire Rail (Core)	Package B: South Hampshire Rail (Enhanced)	Package D: Isle of Wight Connectivity
A1 Solent Connectivity Strategic Study	B1 Southampton Central Station - Woolston Crossing	D1 New Isle of Wight Mass Transit System
A2 Botley Line Double Tracking	B2 New Southampton Central Station	D1a Bus Mass Transit - Newport to Yarmouth
A3 Netley Line Signalling and Rail Service Enhancements	B3 New City Centre Station	D1b Bus Mass Transit - Newport to Ryde
A4 Fareham Loop / Platform	B4 South West Main Line - Mount Pleasant Level Crossing Removal	D1c Bus Mass Transit - Newport to Cowes
A5 Portsmouth Station Platforms	B5 West Coastway Line - Fareham to Cosham Capacity Enhancements	D1d Isle of Wight Railway Service Enhancements
A6 South West Main Line - Totton Level Crossing Removal	B6 Cosham Station Mobility Hub	D1e Isle of Wight Railway Extensions or Mass Transit alternative - Shanklin to Ventnor
A7 Southampton Central Station Upgrade and Timetabling	B7 Eastleigh to Romsey Line - Electrification	D1f Isle of Wight Railway Extensions or Mass Transit alternative - Shanklin to Newport
A8 Eastleigh Station Platform Flexibility	B8 Havant Rail Freight Hub	D2 Isle of Wight Ferry Service Enhancements
A9 Waterside Branch Line Reopening	B9 Fratton Rail Freight Hub	D2a Operating Hours and Frequency Enhancements
A10 West of England Service Enhancements	B10 Southampton Container Port Rail Freight Access and Loading Upgrades	D2b New Summer Route - Ryde to Southampton
A11 Additional Rail Freight Paths to Southampton	B11 Southampton Automotive Port Rail Freight Access and Loading Upgrades	

Packages of Interventions

The Area Studies Programme has identified the following **seven Packages of Interventions** for the rail network. The Interventions included in these Packages are presented in the following eight pages.

Package F: Sussex Coast Rail	Package J: London – Sussex Coast Rail	
F1 West Coastway Strategic Study	J1 Croydon Area Remodelling Scheme	J9 Newhaven Port Capacity and Rail Freight Interchange Upgrades
F2 West Worthing Level Crossing Removal	J2 Brighton Main Line - 100mph Operation	J10 Uckfield Branch Line - Hurst Green to Uckfield Electrification
	J3 Brighton Station Additional Platform	J11 Redhill Aerodrome Chord
	J4 Reigate Station Upgrade	K1 Uckfield - Lewes Wealden Line Reopening - Traction and Capacity Enhancements
	J5 Arun Valley Line - Faster Services	K2 Uckfield - Lewes Wealden Line Reopening - Reconfiguration at Lewes
	J6 East Coastway Line - Faster Services	K3 Spa Valley Line Modern Operations Reopening - Eridge to Tunbridge Wells West to Tunbridge Wells
	J7 Brighton Main Line - Reinstate Cross Country Services	
	J8 New Station to the North East of Horsham	

Packages of Interventions

The Area Studies Programme has identified the following **seven Packages of Interventions** for the rail network. The Interventions included in these Packages are presented in the following eight pages.

Package O: Wessex Thames Rail	
O1 Western Rail Link to Heathrow	O12 South West Main Line / Portsmouth Direct Line - Woking Area Capacity Enhancement
O2 Southern Rail Link to Heathrow	O13 South West Main Line / Basingstoke Branch Line - Basingstoke Enhancement Scheme
O3 Reading to Basingstoke Enhancement	O14 Cross Country Service Enhancements
O4 North Downs Line - Electrification	O15 Portsmouth Direct Line - Line Speed Enhancements
O5 North Downs Line - Level Crossing Removals	O16 Portsmouth Direct Line - Buriton Tunnel Upgrade
O6 North Downs Line - Service Level and Capacity Enhancements	O17 South West Main Line - Digital Signalling
O7 Guildford Station Upgrade	O18 Theale Strategic Rail Freight Terminal
O8 New Station Guildford West (Park Barn)	O19 West of England Main Line - Electrification from Basingstoke to Salisbury
O9 New Station Guildford East (Merrow)	O20 Reading to Waterloo Service Enhancements
O10 Redhill Station Upgrade	
O11 Dorking Deepdene Station Upgrade	

Packages of Interventions

The Area Studies Programme has identified the following **seven Packages of Interventions** for the rail network. The Interventions included in these Packages are presented in the following eight pages.

Package S: Kent, Medway and East Sussex Classic Rail

S1 St Pancras International Domestic High Speed Platform Capacity

S2 London Victoria Capacity Enhancements - Signalling and Digital Rail

S3 Bakerloo Line Extension

S4 south eastern Main Line - Chislehurst to Tonbridge Capacity Enhancements

S5 London Victoria to Shortlands Capacity Enhancements

S6 Hoo Peninsula Passenger Rail Services

S7 North Kent Line / Hundred of Hoo Railway - Rail Chord

S8 Thameslink - Extension to Maidstone and Ashford

S9 North Kent Line - Service Enhancements

S10 North Kent Line / Chatham Main Line - Line Speed Enhancements

S11 Otterpool Park / Westenhangar Station Platform Extensions and Station Upgrade

S12 Integrated Maidstone Stations

S13 Dartford Station Remodelling / Relocation

S14 Canterbury Rail Chord

S15 New Station - Canterbury Interchange

S16 New Strood Rail Interchange

S17 Rail Freight Gauge Clearance Enhancements

S18 Crossrail - Extension from Abbey Wood to Dartford / Ebbsfleet

S19 High Speed 1 / Waterloo Connection Chord - Ebbsfleet Southern Rail Access

S20 Ebbsfleet International (Northfleet Connection)

S21 Ebbsfleet International (Swanscombe Connection)

S22 Gatwick - Kent Service Enhancements

Packages T & U: Kent, Medway and East Sussex High Speed Rail

T1 High Speed East - Dollands Moor Connection

T2 High Speed 1 / Marsh Link - Hastings, Bexhill and Eastbourne Upgrade

U1 High Speed 1 - Link to Medway (Chatham)

U2 High Speed 1 - Additional Services to West Coast Main Line

Package A: South Hampshire Rail (Core)

Overview

Network Rail, Solent Transport, and the Solent Authorities have developed a comprehensive package of interventions that will deliver improvements to urban and inter-urban rail journeys.

These form part of the Solent Connectivity Strategic Study (formerly the Solent Continuous Modular Strategic Plan), the main objective of which is to deliver additional local rail services so that most of the stations in the area currently served by infrequent one train per hour (1tph) services get a much more frequent "semi metro" 2 to 3tph (or perhaps "metro" 4tph) service frequency.

The plan includes interventions such as the provision of an additional through line / overtaking line at Fareham, increasing capacity on the Botley line to twin tracks, adding platform capacity at Portsmouth Harbour, signalling improvements on the Netley Line, and timetable changes to maximise capacity at Southampton Central.

A key enabler to the plan is the provision of sidings at Totton and a solution to a level crossing constraint in this area. This would then allow many local trains from Southampton to be run on to Totton for two reasons: 1) to reduce platform demand/improve capacity at Southampton Central by having fewer trains terminate there, and 2) to improve service to Totton which is currently under-served.

The Solent Connectivity Strategic Study will also complement passenger rail services to be introduced to the Fawley Branch Line and serve a large planned development in this area. While alternative uses for this railway have been explored, there appears to be consensus that this corridor should develop as (an ideally electrified) heavy rail service. Ferries could also complement this service.

Benefits

- **Capacity** enhancements across the whole Solent conurbation
- Improvements in **service frequencies**, especially for urban metro services
- Better **interchange** and **service quality** at Southampton Central station
- More new and growing communities will have **access** to the national rail network

Modelling Results



£285m

GVA uplift per annum (by 2050, 2020 prices)



15,000

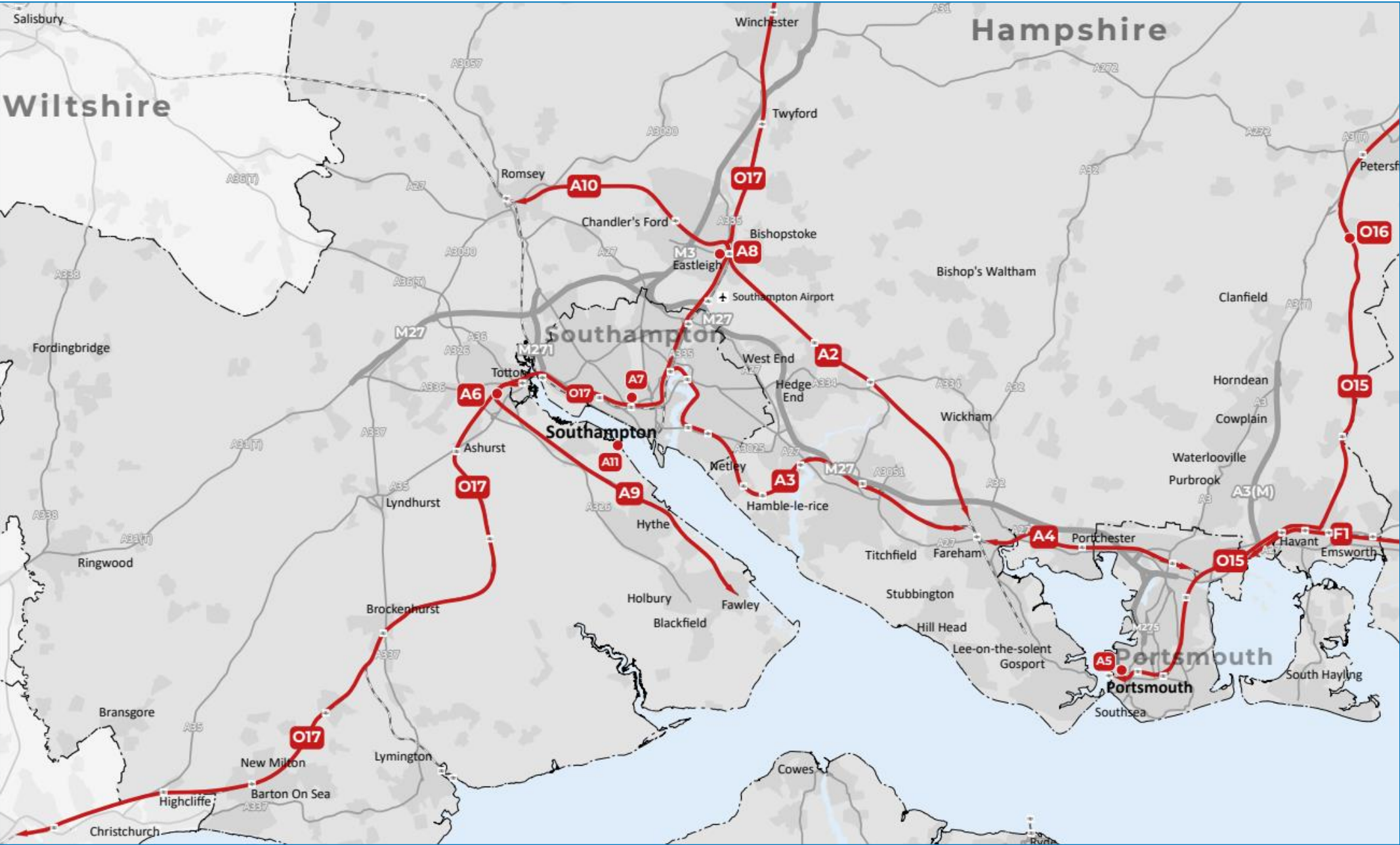
More return rail trips per weekday



5,000

Fewer return car trips per weekday

Package A: South Hampshire Rail (Core)



Package B: South Hampshire Rail (Enhanced)

Overview

Building on the core package, TfSE’s strategic studies have a horizon as far as 2050 and an ambition to deliver transformational change in sustainable travel options across South Hampshire. Solent Transport and Local Transport Authorities have previously stated an ambition to deliver a level of service on urban metro routes comparable to suburban London, akin to four trains per hour – a “metro” level of service.

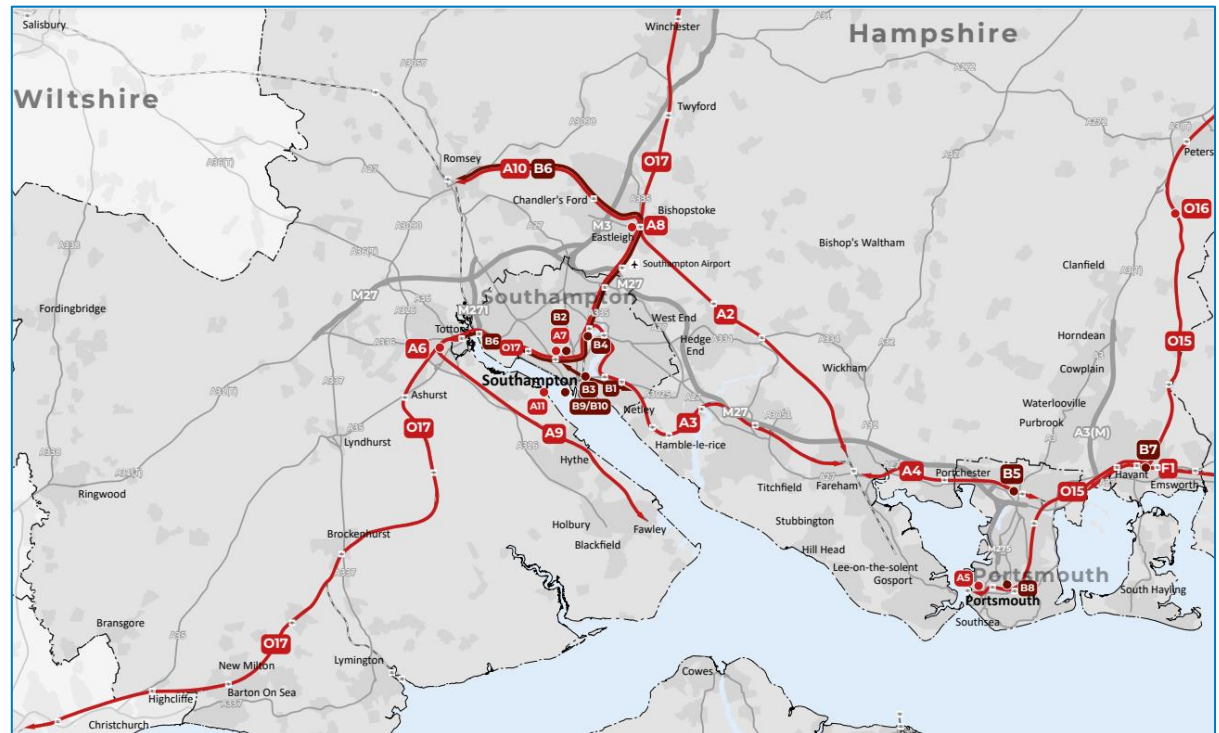
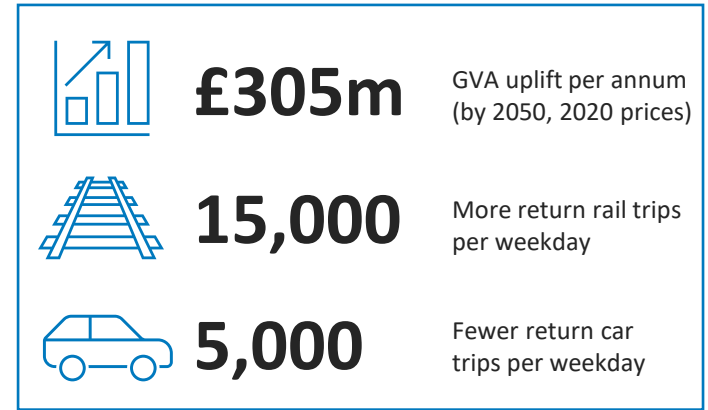
There are also aspirations to grow freight and provide better connectivity between South Hampshire, the West of England, the Midlands, and beyond. This requires more capacity than the current network can provide. The key bottleneck preventing this from being realised is the tunnel between Southampton Central and St Denys.

TfSE has worked with key stakeholders to develop a longer-term package of scheme that unlock significant capacity and shorter journey times between Southampton and Portsmouth City Centres. This could include a potential new underground link between Southampton Central and the Netley Line providing a more direct route and deconflicting north-south and east-west rail movements.

Benefits

- **Transformational capacity and connectivity benefits** – especially on east-west rail journeys (30 – 35 minute Southampton – Portsmouth journeys)
- Supports **regeneration** of Southampton City Centre and other **growth** areas
- Significant boost to **GVA** in a relatively deprived part of the South East
- Large **reduction in carbon emissions**.

Modelling Results (additional to core)



Package D: Isle of Wight Connectivity

Overview

TfSE believe the Isle of Wight has the characteristics to support a high-quality, integrated mass transit system.

TfSE and key stakeholders have identified a package of interventions aimed at improving connectivity between the Isle of Wight and the Mainland and improving connectivity within the Isle of Wight itself.

Stakeholders from the Isle of Wight and wider Solent region all raised opportunities to transform ferry services, through increasing frequency of services, extending hours of operation, more affordable ferry fares, and the possibility of new seasonal routes.

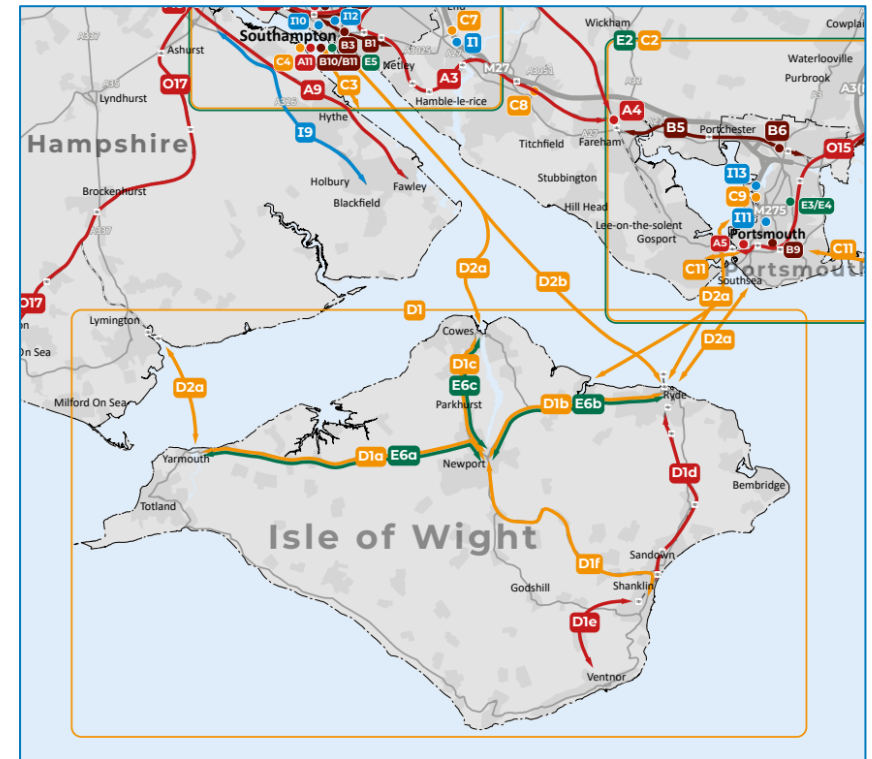
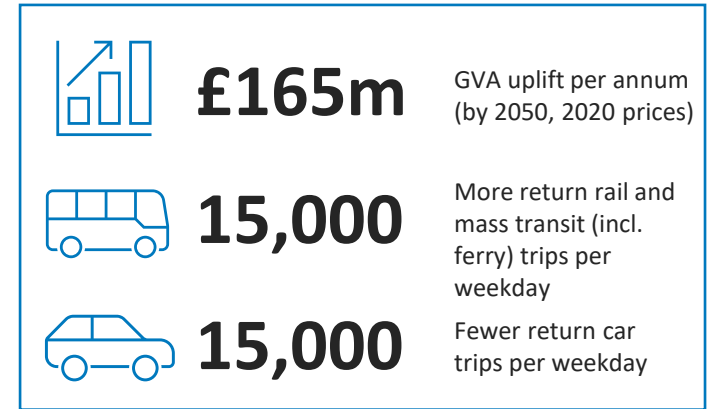
The Isle of Wight has the potential to be an exemplar for public transport given its size and unique characteristics.

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 Transit system connecting key destinations across the Island including ferry terminals and tourism hotspots and delivery of the LCWIP and island-wide segregated active travel routes.

Benefits

- **Transformational improvement** in the quality, speed, and frequency of ferry services between the Isle of Wight and Mainland.
- **Seamless integration** between ferry and public transport on the mainland and the Isle of Wight supporting sustainable onward connectivity.

Modelling Results



Package F: Sussex Coast Rail

Overview

Network Rail has worked with Local Transport Authorities to develop a package of improvements for the West Coastway and East Coastway lines.

The West Coastway Strategic Study (formerly Continuous Modular Strategic Planning), if delivered, would result in faster journeys and more capacity between Brighton and Hove and Southampton. However, there is not enough capacity to accommodate all stakeholder aspirations on this corridor.

The package identified here supports those interventions that best support inter-urban and long-distance journeys – those for which car alternatives have greatest emissions and other sustainable modes are less likely to provide attractive alternatives.

In the east of Sussex Coast area, a package (see Kent, Medway and East Sussex – High Speed Rail – East), includes extending high speed rail services off High Speed 1 at Ashford along an upgraded Marsh Link Line to Hastings, Bexhill and Eastbourne. This has the potential to almost halve journey times between Hastings as London, as well as considerable improvements to more local, and inter-urban travel.

Benefits

- **Faster journeys** between Brighton, Chichester, Portsmouth, and Southampton
- Potentially **more frequent longer distance services** between Brighton, Chichester, Portsmouth, and Southampton
- **Additional capacity** between Worthing and Brighton for shorter journeys

Modelling Results (excl. High Speed services to Hastings, Bexhill and Eastbourne)



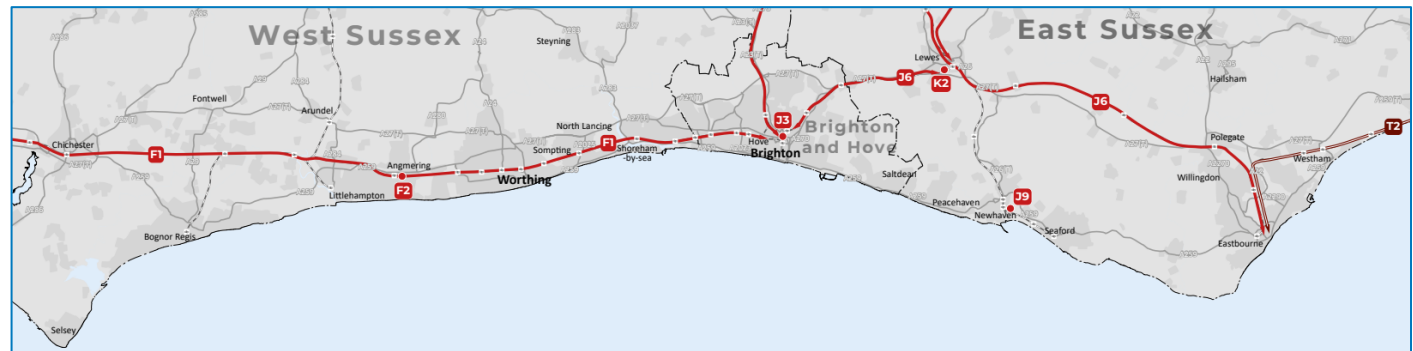
£80m

GVA uplift per annum (by 2050, 2020 prices)



5,000

More return rail trips per weekday



Package J: London – Sussex Coast Rail (Core) | London – Sussex Coast Rail (Reinstatements)

Overview

In collaboration with Network Rail and the Local Transport Authorities a package of rail interventions has been developed which will enhance connectivity, and reliability between London and the Sussex Coast.

The **Core Rail Package** addresses key bottlenecks on the Brighton Main Line, enabling faster, more reliable services. It also provides line speed enhancements allowing for faster journeys on the Arun Valley Line and the East Coastway Line. Electrification of the Uckfield Branch of the Oxted Line stimulates positive operational and environmental impacts.

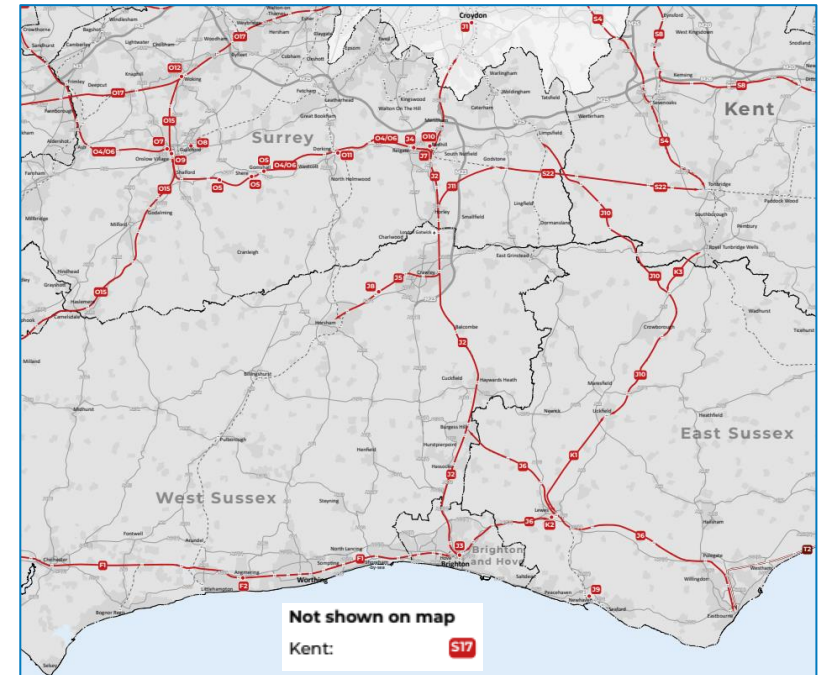
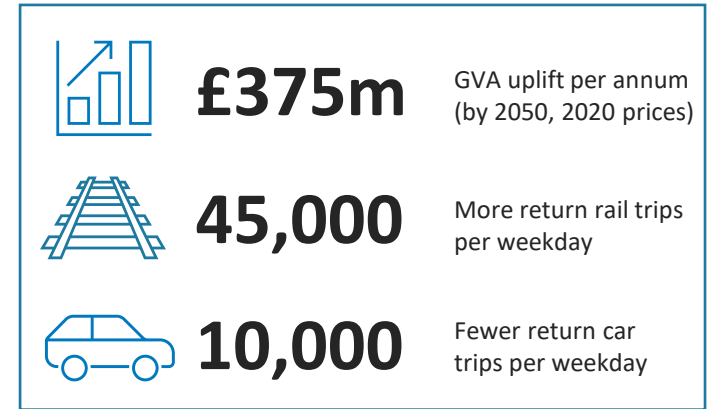
The **Railway Reinstatements Package** brings back into use the Uckfield – Lewes railway and the Tunbridge Wells West – Tunbridge Wells (Central) railway. This will increase resilience of rail connectivity between the South Coast and London whilst creating a new east west rail link between the Brighton Main Line and Hastings Line.

Several other historical railways have been considered for reinstatement, but the study found the conversion to active travel corridors would have a more positive impact.

Benefits

- Improvements to **resilience** of north south rail trips
- Increased **reliability** on Brighton Main Line serving key strategic locations
- **Faster journeys** on Brighton Main Line, Arun Valley Line and East Coastway Line.
- Improved access to **boost** (currently) **less prosperous coastal areas**.
- Enhanced **connectivity** from Brighton via Lewes and Uckfield to Tunbridge Wells.
- Large reduction in **carbon emissions**.

Modelling Results



Package S: Kent, Medway and East Sussex (KMES) Classic Rail

Overview

This package adds capacity to the classic rail network in the South East Area. It targets the areas of Kent that lie closest to London.

Areas further away from London will be served by high speed rail interventions described in the following slide.

The package includes several interventions that add capacity through additional services (e.g. Crossrail to Ebbsfleet, Thameslink to Maidstone) as well as interventions that materially increase track and platform capacity (e.g. through capacity released by the Bakerloo Line extension).

It also includes interventions that improve the integration of the rail system – notably at Ebbsfleet, Canterbury, Maidstone, and Strood – where several railway lines cross each other without providing easy interchange from one railway to another.

It also includes the introduction of passenger rail services on the Grain Branch and direct services between Gatwick Airport and Mid/East Kent.

Benefits

- **Capacity** enhancements at key bottlenecks on radial corridors
- Improvements in **service frequencies**, especially for urban metro services
- Better **interchange** between rail services and other modes
- Better rail access for new/growing areas.
- Large **reduction in carbon emissions**.

Modelling Results



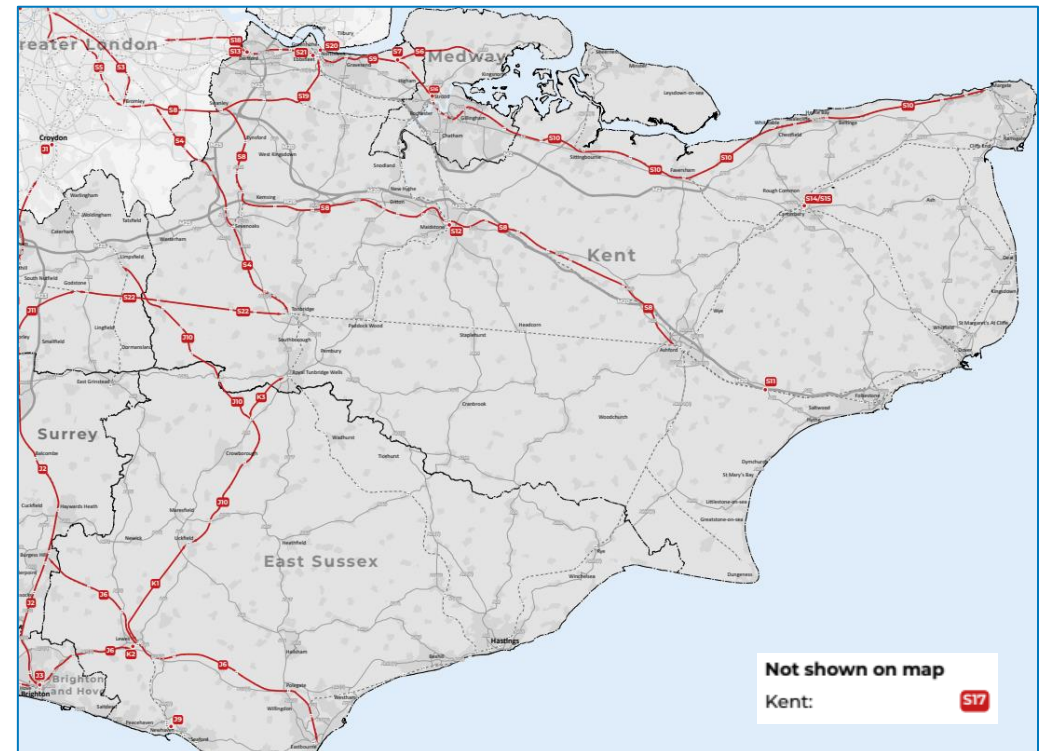
£140m

GVA uplift per annum
(by 2050, 2020 prices)



15,000

More return rail trips
per weekday



Packages T & U: High Speed Rail Packages

Overview

These packages includes some of the more radical interventions in the long list for this study. They are based around expanding the domestic high speed service to deliver transformational improvements in journey times to Kent, Medway, and East Sussex.

The **East Package** would deliver direct High Speed services from London to Eastbourne via Ashford and Hastings, reducing journey times from Hastings/Bexhill to London by 20 minutes. It would also deliver faster journey times to Dover using a connection to HS1 at Dollands Moor, and an increase in the frequency of HS1 services to Ashford

The **North Package** aims to deliver significant improvements in connectivity to North Kent to ensure coastal communities in Medway, Swale, Canterbury, and Thanet are as well served as other parts of Kent. Several high-level options have been considered, ranging from a new link between HS1 and Medway to improvements to the North Kent Line and Rochester Bridge. The modelling represented for this package reflects one of the more interventionalist options.

There are also opportunities to replace domestic service rolling stock on HS1 and expand the fleet to capitalise on network enhancements.

Benefits

- **Transformational improvements in journey times** between London (and the rest of the UK) and the South East coast.
- Potentially **transformational improvements in capacity** between London and coastal Kent/Medway/East Sussex, delivering significant economic **boost to left behind coastal areas**.
- Large **reduction in carbon emissions**.

Modelling Results



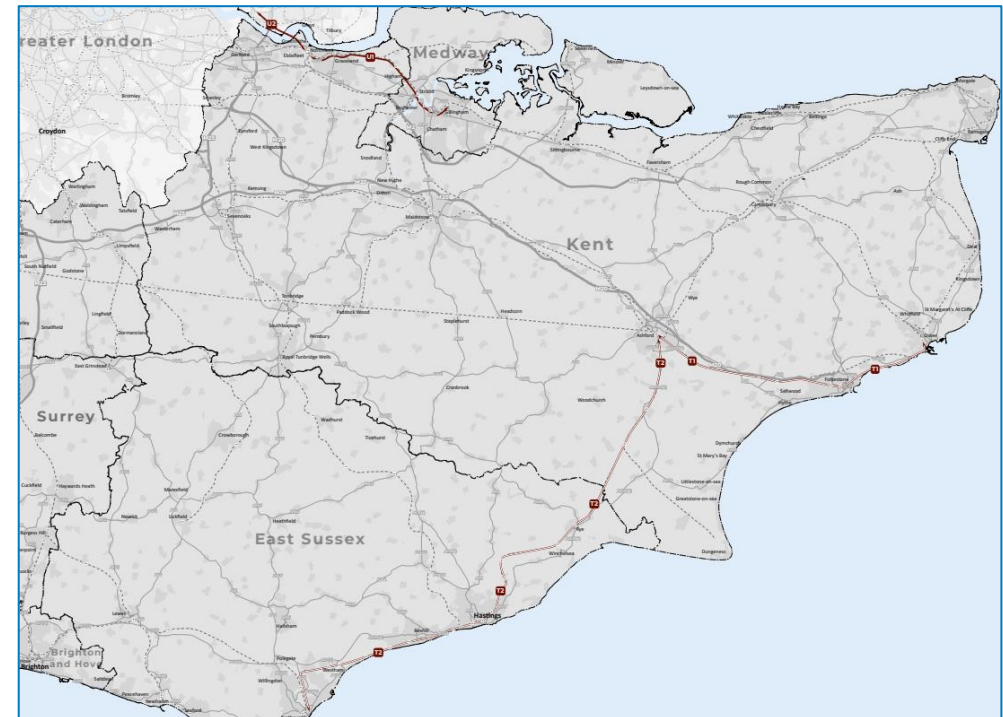
£350m

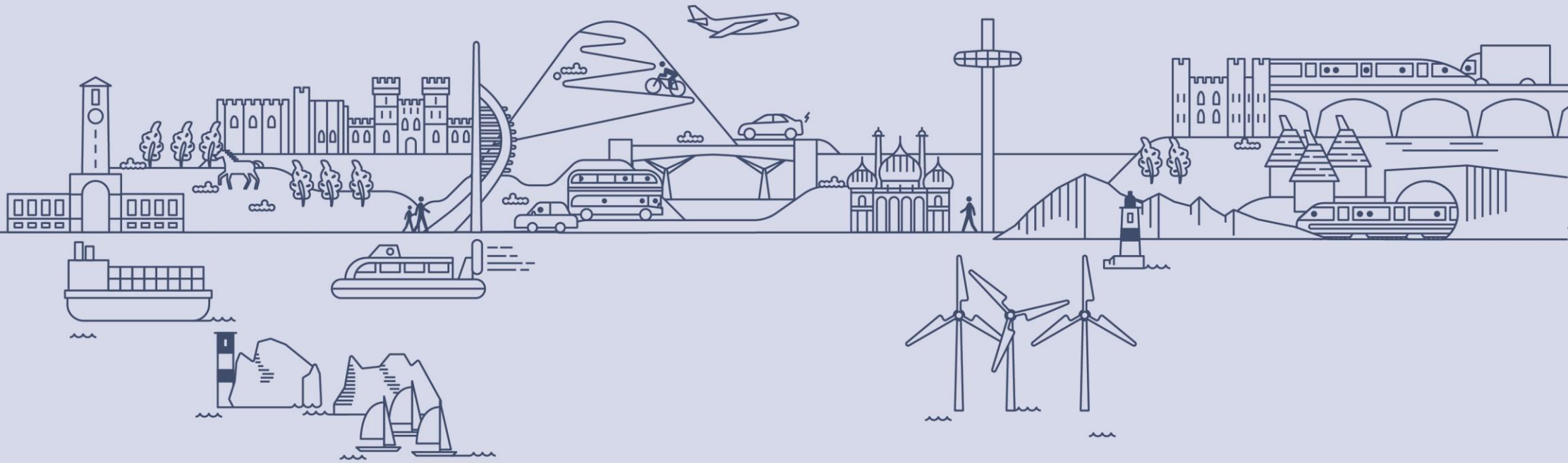
GVA uplift per annum
(by 2050, 2020 prices)



55,000

More return rail trips
per weekday





Part 5: Benefits and Costs

Benefits and Costs

Modelling Benefits

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.

SEELUM produces detailed reports on:

- changes in land-use in each zone (i.e., housing units and business 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 CO₂ emissions from transport activity;
- travel patterns, volumes and mode shares; and
- time savings benefits for appraisal and impacts on productivity.

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 railway network (notably capacity and speed).

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 results of the modelling of all seven Rail Packages of Interventions is presented in **Table 2** on the following page..

While the total benefits of the Packages of Interventions is important, it is also helpful to consider the spatial impacts of these Packages. As an example, the impacts on coastal communities in Kent, Medway, and East Sussex, as presented in **Figure 22**, appear to show strong alignment with the Government's Levelling Up ambitions.

Estimating Costs

Capital cost estimates have been prepared to a level of detail commensurate with the maturity of the design of the Packages of Interventions and are presented in **Table 2**.

Items and quantities have been priced using historic project data and industry standard published data, with adjustments made to capture the influence that quantity, access, time constraints, site location and conditions will have on labour, plant and materials input costs.

A contingency has been added for minor items that have not been measured. Allowances have been made for main contractor's preliminaries and overhead and profit, temporary works and traffic management where required. Allowances for professional fees, upgrades, and relocation have also been added to the construction cost estimate. To reflect the maturity of the design a risk allowance has been applied.

Operations, Maintenance, Renewal and impacts on tax revenue are excluded from these costs.

Modelling Results

South Hampshire Rail (Core/Enhanced)

The Hampshire packages would boost the number of rail trips by over 33,000 return trips a day (together) and deliver a significant uplift in GVA (£594m).

This provides good evidence to pursue both – including the second package, which has more significant, longer-term interventions.

There is a modest reduction in carbon emissions. This is because these interventions generate economic growth, which offsets some of the decarbonisation gains achieved through mode shift.

Sussex Coast Rail

The Sussex Coast Rail Package, since it is underpinned by a BRT scheme, delivers modest growth in rail use, a reduction in car trips, and a boost to GVA.

The scale of interventions in this Package are not at quite the same level as the South Hampshire rail packages, as the corridor serves a lower population density than the mass transit interventions included in other Packages.

London – Sussex Coast Rail

The Core Rail Package delivers a significant boost to GVA (up to £374m per annum) and encourages mode shift from car to rail.

The modelling results suggest this Package could deliver a very significant increase in rail patronage (43,600+ weekday return trips per day).

These results are significant, and should give investors confidence in the level of growth that could be realised through investing in the Brighton Main Line.

Wessex Thames Rail

This Package significantly boosts GVA (£848m) and rail trips.

The packages combine to increase the number of local and strategic orbital rail trips by 13,500+. They also deliver a boost to the economy of the Major Economic Hubs in the Wessex Thames area, generating more employment opportunities and a larger boost to GVA than all other rail packages.

Kent, Medway, East Sussex Classic Rail

The High Speed Rail (East) Package delivers a significant boost for employment and economic growth (represented by GVA).

This package boosts rail demand by over 16,000 return rail trips each weekday. By 2050, it is estimated that this package could unlock GVA growth of £139m per annum, while minimising growth in car trips and carbon emissions.

Kent, Medway, East Sussex High Speed

The High Speed Rail Packages delivers a significant boost for GVA (£353m per annum), particularly less prosperous areas in coastal Kent, Medway and East Sussex.

The scale of impact of this package on transport and socioeconomic outcomes is around double the impact of the Classic Rail Package, but the impacts are concentrated in the coastal Kent, Medway and East Sussex Districts (see **Figure 22**). This suggests this package aligns strongly with the government's "Levelling Up" agenda.

Benefits and Costs

Table 2: Benefits and Costs

Package	Population (2050)	New jobs (2050)	GVA (£m in 2050)	Total CO ₂ (Tonnes in 2050)	Car Trips (weekday return in 2050)	Rail Trips (weekday return in 2050)	MT Trips (weekday return in 2050)	Total Trips (weekday return in 2050)	Capital Construction Costs (£m, 2020 prices)	Annual Capital Maintenance & Renewal Costs (£m, 2020 prices)
Solent Rail Core	1,050	1,550	285	-	-5,000	15,000	-	5,000	600	15
Solent Rail Enhanced	1,150	2,000	305	-	-5,000	15,000	-	10,000	3,700	95
Sussex Coast Rail	700	350	80	-	-	5,000	-	5,000	500	25
London – Sussex Coast Rail	6,250	2,350	375	-10,000	-10,000	45,000	-	30,000	3,000	15
Wessex Thames Rail	3,100	3,750	850	-5,000	-5,000	50,000	-	35,000	7,200	185
Kent, Medway, E Sussex Classic Rail	6,150	1,500	140	-15,000	-	15,000	-	20,000	3,700	95
Kent, Medway, E Sussex High Speed Rail	17,500	3,850	350	-30,000	-	50,000	-	50,000	8,300*	215
Sum of Packages	35,900	13,100	2,390	-55,000	-25,000	195,000	-5,000	155,000	27,000	645

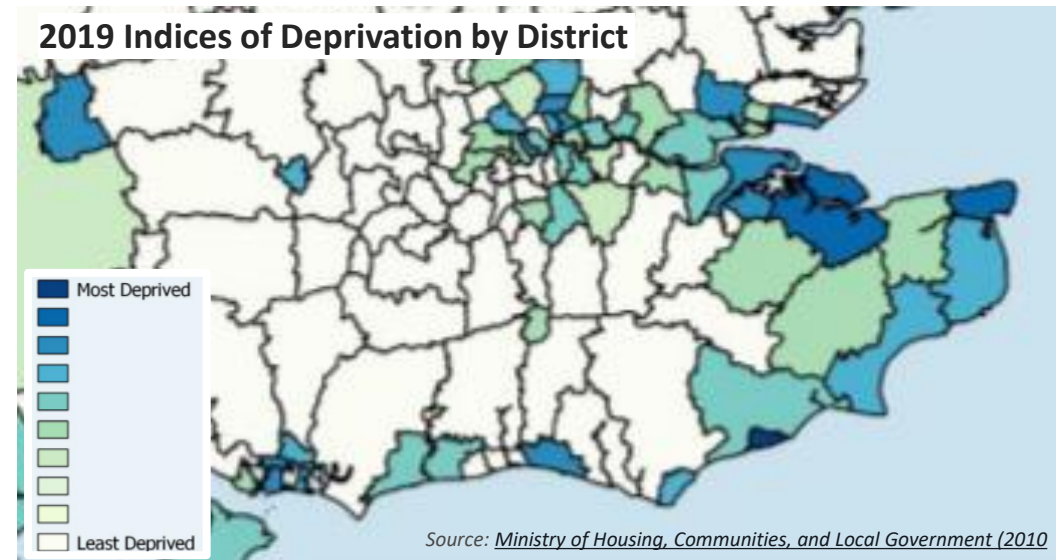
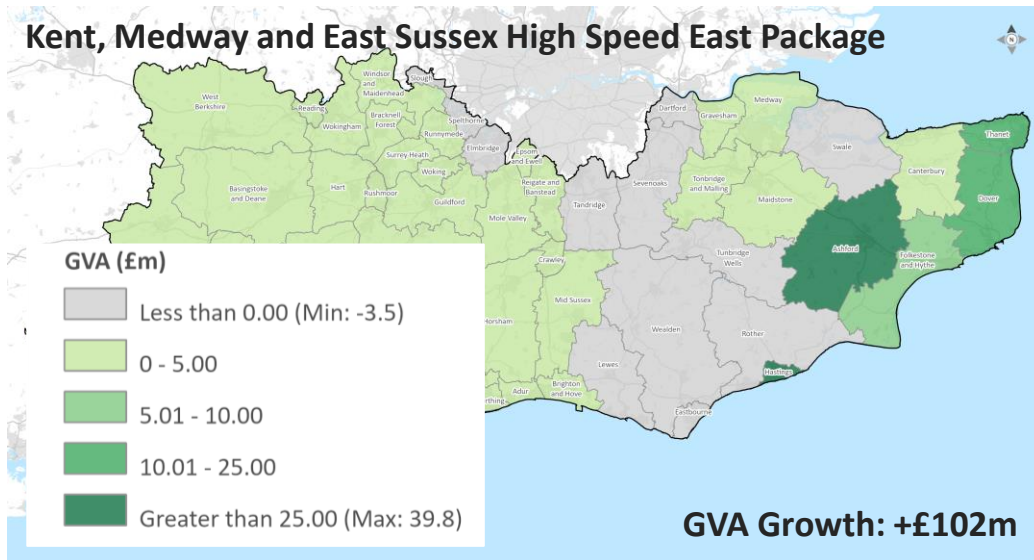
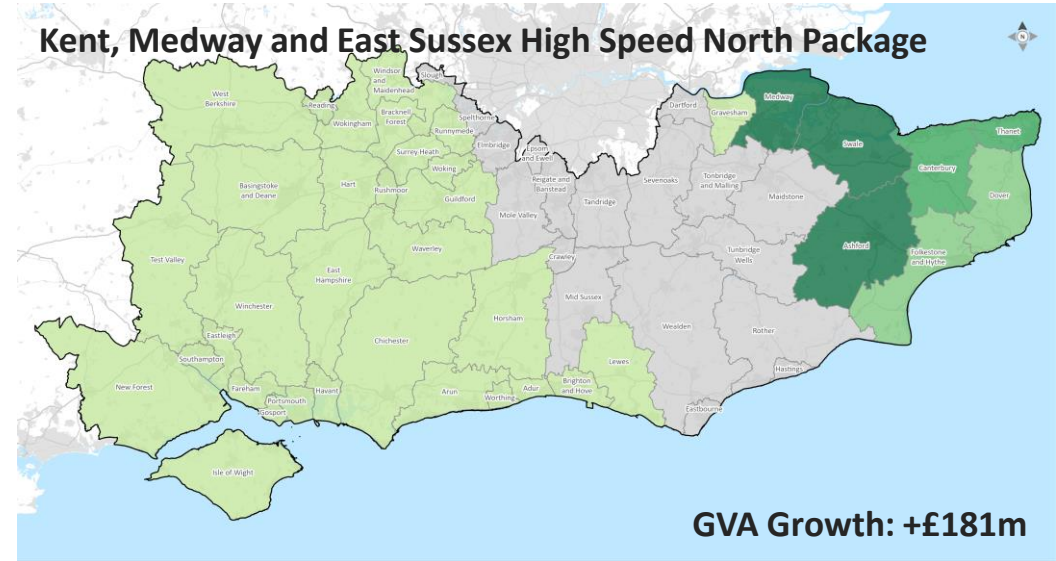
*Assumes HS1 Link to Medway via Chatham

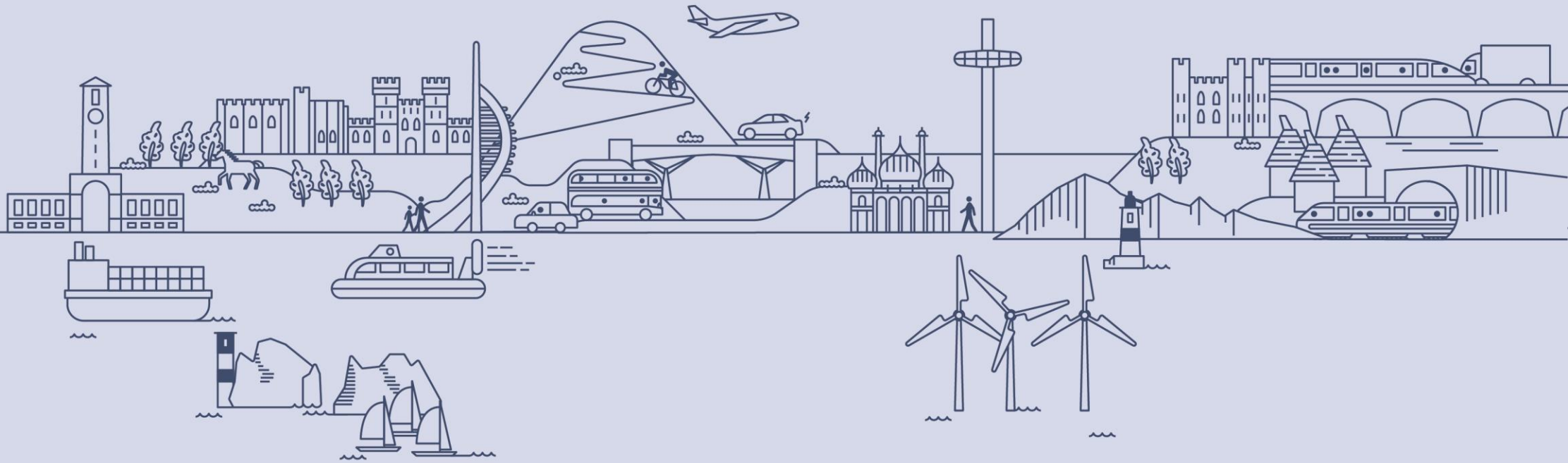
Notes

- GVA (Gross Value Added) is GVA per annum for 2050 in 2020 prices.
- Costs are capital and in 2020 prices.
- Trips are return trips on a typical week day.
- Carbon emissions are CO₂ tonnes equivalent in 2050, reflecting modal shift and wider impacts on the economy (e.g. population growth).
- A significant driver of changes in carbon emissions is trip length. For example, while the modelling suggests Kent/Medway/East Sussex Packages will generate more car trips and fewer bus and active travel trips, there will still be an overall reduction in emissions due to longer distance car trips switching to rail
- The total row presented above is the sum of the packages. The combined impact of these interventions is presented in the Strategic Narrative.
- Total trip numbers are not the sum of the preceding three columns due to rounding of numbers and trips by other modes.
- Figures rounded to nearest: £50m for Capital Cost; £5m for GVA; 50 new residents /jobs; 5,000 kilo-tonnes CO₂e; and 5,000 daily return trips

Spatial Impacts (Kent, Medway, and East Sussex Example)

Figure 22: GVA per annum growth by district (by 2050) for rail packages





Part 6: Delivery

Introduction

Introduction

TfSE will work with partners – notably Network Rail and GBR (when established), together with the support of local transport authorities and other partners – to deliver the global interventions, infrastructure and services outlined in Parts 4 and 5.

The delivery of the Packages of Rail Interventions will need to consider:

- roles and responsibilities;
- timing and phasing;
- funding and financing; and
- monitoring and evaluation.

This Part provides an overview of a suggested approach to the topics listed above.

Roles and Responsibilities

The GB rail industry is not in a steady state and is expected to undergo extensive structural reform in the next few years.

In the immediate future, it is assumed that the **Department for Transport** will continue to outline the strategy for the rail network, **Network Rail** will continue in its role as infrastructure manager for the rail network, and that **Train Operating Companies** will continue to deliver passenger rail services.

However, in the medium term, we expect Network Rail’s strategic and planning functions (along with functions within the Department for Transport and Rail Delivery Group) will merge into a new government agency **Great British Railways**.

This new agency will lead the future development of the rail network in Great Britain and specify future infrastructure and service needs. It will also manage most passenger rail services in the South East through new Passenger Service Contracts.

Great British Railways will therefore be one TfSE’s most important partners in delivering its vision for the South East’s rail network.

TfSE’s role will reflect its current and likely future status as an established Sub National Transport Body for South East England.

It is assumed there would be no significant change in the current distribution of powers, funding mechanisms, and democratic accountability in South East England at a local level. This assumes there will be – for example – no Mayoral Combined Authorities in South East England with the powers and resources to take on more responsibility for the day to day operation of the rail network.

TfSE’s role will therefore focus on building consensus and capacity to deliver its transport strategy through others. It will tailor its approach to the mode, scale, and level of development of each prioritised intervention.

A suggested approach for delivering the Packages of Interventions – including Global Policy Interventions – is provided **Table 3** on the following page.

Roles and Responsibilities

Table 3: Roles and Responsibilities

Intervention	Lead Authority	TfSE Role
Global policy interventions (e.g. lower public transport fares).	<ul style="list-style-type: none"> Central Government (e.g. Department for Transport) 	<ul style="list-style-type: none"> TfSE to advocate for central government to adopt these policies
Passenger rail services that can be introduced without new infrastructure, but which will likely require government support and/or capacity allocation within a passenger service contract (or franchise)	<ul style="list-style-type: none"> Today: Department for Transport Future: Great British Railways 	<ul style="list-style-type: none"> Stakeholder engagement between Central Government, operators and local partners Business case development, including use of and providing access to TfSE’s emerging analytical framework Advocacy and securing funding
Passenger rail services that can be introduced without new infrastructure, and without central government intervention (e.g. more international services to Mainland Europe, more freight services).	<ul style="list-style-type: none"> Open Access Operators 	<ul style="list-style-type: none"> Stakeholder engagement with operators, local partners and Central Government Use of and providing access to TfSE’s emerging analytical framework Advocacy
For passenger or freight rail services requiring new infrastructure (e.g. high speed services to Hastings)	Schemes under development	
	<ul style="list-style-type: none"> Department for Transport (very large projects e.g. Crossrail) Network Rail (most schemes e.g. Croydon Area Remodelling) 	<ul style="list-style-type: none"> Stakeholder engagement with Central Government and local partners Business case and scheme development and support, including use of and providing access to TfSE’s emerging analytical framework if at an earlier stage of development Advocacy and securing funding
	Schemes not currently under development	
	<ul style="list-style-type: none"> Likely Network Rail and, later on, Great British Railways TfSE could be a joint scheme promoter 	<ul style="list-style-type: none"> Stakeholder engagement with Central Government and local partners Pre-feasibility work Business case and scheme development and support, including use of and providing access to TfSE’s emerging analytical framework Advocacy and securing funding

Timing and Phasing

The timing and phasing of each Package of Intervention will be driven by their current state of development, industry funding cycles, and institutional capacity.

Any intervention not currently included in the Rail Network Enhancements Pipeline – which is most of the interventions in this plan – will almost certainly be phased to be delivered in Control Period (CP) 8 (2029-2034) or thereafter. An estimate of the schedule for the delivery of each rail Package is presented in **Figure 23**.

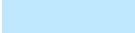


Some Packages have interfaces that will also affect their phasing. For example:

- Most elements in the Enhanced Solent Package should be delivered after the Core Solent Package.
- While the Sussex Coast Package can be delivered in isolation, there are strong synergies with this Package and the Solent Packages and London – Sussex Coast packages.
- The High Speed Packages will have significant impacts on each other in terms of timetable specification, rolling stock provision, and capacity allocation.

Figure 23: High level schedule for the delivery of Packages of Interventions

Package	2022-25 CP6	2026-30 CP7	2031-35 CP8	2036-40 CP9	2041+ CP10+
Solent Rail (Core)					
Solent Rail (Enhanced)					
Sussex Coast Rail					
Wessex Thames Rail (Medium Term)					
Wessex Thames Rail (Long Term)					
London – Sussex Rail (Core)					
London – Sussex Rail (Reinstatements)					
Kent Classic Rail					
Kent High Speed Rail (East)					
Kent High Speed Rail (North)					

Key to shading

-  Development Phase
-  Delivery Phase
-  Operational Phase

Other Delivery Considerations

Funding and Financing

The Strategic Investment Plan will consider funding and financing options in detail.

This topic is best considered from a pan-regional, multi-modal perspective, as there may be opportunities for developing linkages between modes at a local level.

In general, experience suggests some of the best ways of securing investment in major rail interventions are to:

- focus on **incremental schemes** to unlock benefits as schemes develop;
- focus on **regeneration** and high growth opportunities; and
- focus on **high demand**, particularly on flows that have significant importance to the wider economy (e.g. ports, airports, approaches to London, etc).

Ultimately, a **Full Business Case** will need to be developed for each intervention, and this will be instrumental in making the case for investment. The best way of securing funding is, therefore, to prioritise those schemes that offer the most compelling case for intervention.

Funding for national rail infrastructure can be sourced from:

- Central government funding (e.g. DfT sponsored Rail Network Enhancements Pipeline).
- Central government loans/bonds.
- Local government contributions (e.g., Work Place Parking Levy, Business Rate Supplement).
- Private investment (e.g., developer contributions).

Additional funding sources could include:

- Borrowing against future revenues.
- Public Private Partnerships / Private Finance Initiatives.
- Land value capture.
- Alternative income streams (e.g., retail at rail stations).
- Road user charging and hypothecation.

Given the scale of investment proposed and the range of transport infrastructure interventions, a portfolio of funding sources will be required reflecting the nature of beneficiaries and the criteria for the funds.

Governance

TfSE, Network Rail/GBR and Local Transport Authorities should establish appropriate governance to oversee the development, delivery, and benefits realisation arising from interventions included in this strategy (particularly the larger and/or more complex interventions), building on recent industry initiatives such as PACE and Project SPEED.

The specifier of the operator contract will have a key role (currently DfT, but GBR in the future) in shaping the requirement. The arrangements will vary according to the type of intervention and its stage of development. In general, the UK government favours governance arrangements reflecting **Managing Successful Programmes (MSP)** and **PRojects In Controlled Environments (PRINCE2)**.

Monitoring and Evaluation

A set of Key Performance Indicators (KPIs) should be used to monitor and evaluate the implementation of this strategy.

A selection of potentially suitable KPIs for monitoring and evaluation the Packages of Interventions in this Plan are presented in **Table 4** on the following page.

Theory of Change Monitoring and Evaluation Framework

Table 4: Key Performance Indicators

Inputs	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> • Funding invested in rail packages • Delivery of interventions 	<ul style="list-style-type: none"> • Capacity: Seats, services per hour • Connectivity: Journey times, frequencies, direct/indirect services • Resilience and performance: Operating performance indicators (e.g. PPM, minutes delay, cancelations, short formations, etc.) • Quality: Service Quality Regimes, Mystery Shopper Regimes, Customer Satisfaction Surveys, other “trust” related indicators • Accessibility: Number of fully accessible stations, portion of rolling stock that is accessible • Affordability: Average fare paid per passenger km, in real terms 	<ul style="list-style-type: none"> • Modal shift: Rail mode share • Revenue: Revenue raised per annum • Economic growth: GVA increased 	<ul style="list-style-type: none"> • More sustainable travel outcomes: Total passenger km, share of passenger km by rail, public transport, and active travel • More financially sustainable railway: Portion of operating costs recovered through revenue • Realisation of TfSE’s Vision and Objectives presented in Part 3 of this Plan • Resolution of the Problem Statements identified in Part 3 of this Plan

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