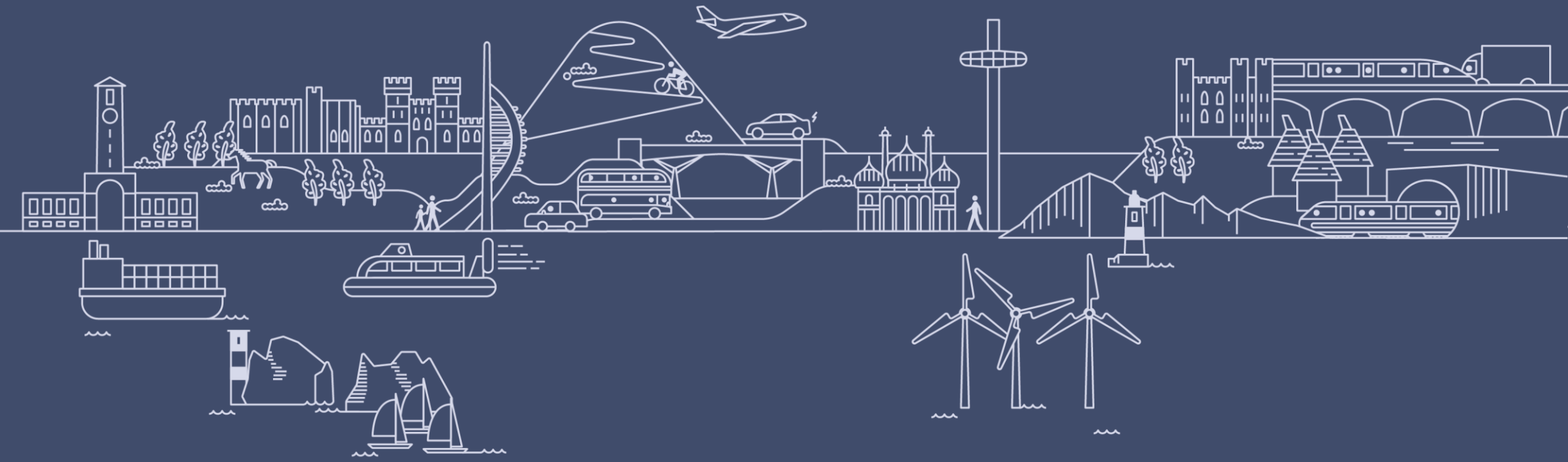
TRANSPORT FOR THE South East

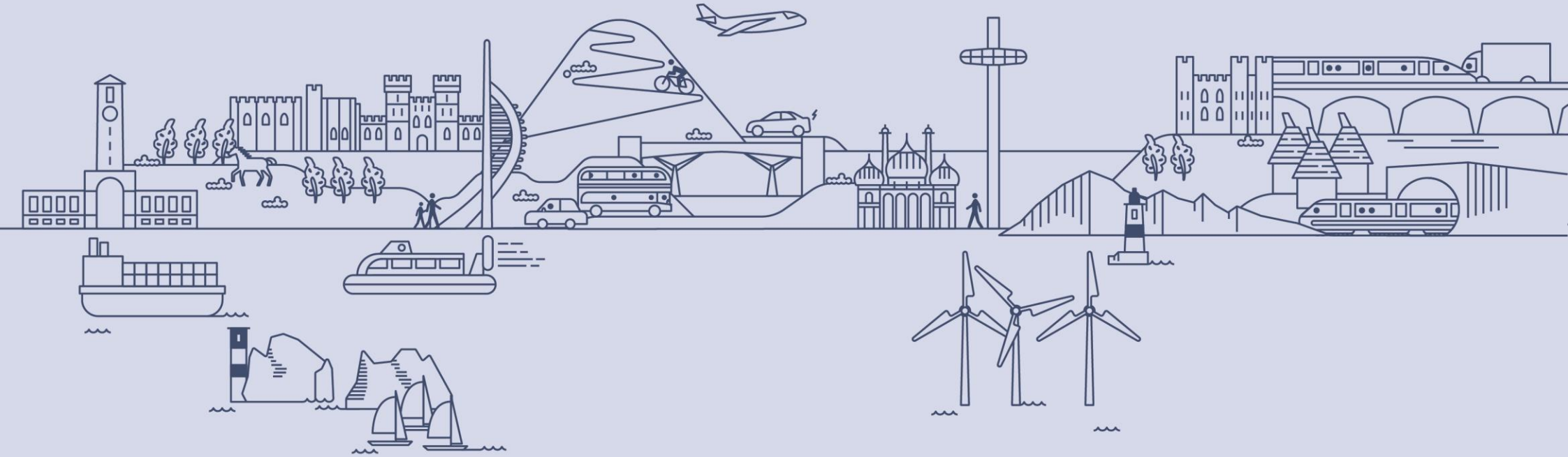


Highways Thematic Plan

Version 3

June 2022

TRANSPORT FOR THE South East



Part 1: Introduction

Introduction

Purpose

This Thematic Plan outlines TfSE's ambitions for the South East's highways

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 Railways, Mass Transit and Bus, Decarbonisation, Strategic Active Travel and Micromobility, and Levelling Up.

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

This Plan then outlines five 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 identifies the potential roles for TfSE in delivering this plan.

Contents

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

- **Part 2** describes the **role of the highways** in the South East. It also discusses when investment in highways is appropriate, and when it is not.
- **Part 3** summarises the key **issues and opportunities** relevant to the South East's highway network that have been identified by the Area Studies.
- **Part 4** outlines TfSE's long-term strategic **Vision and Objectives** for the South East's highway network.
- **Part 5** describes five **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 guide future investment in the region's highways.

TfSE is developing a Strategic Investment Plan (SIP) that will synthesise the technical work undertaken by TfSE to date and present a compelling case for investment in all modes of transport in South East England. **Figure 1.1** overleaf shows the relationship of this plan to other Thematic Plans, the Area Studies programme more broadly, and the Strategic Investment Plan.

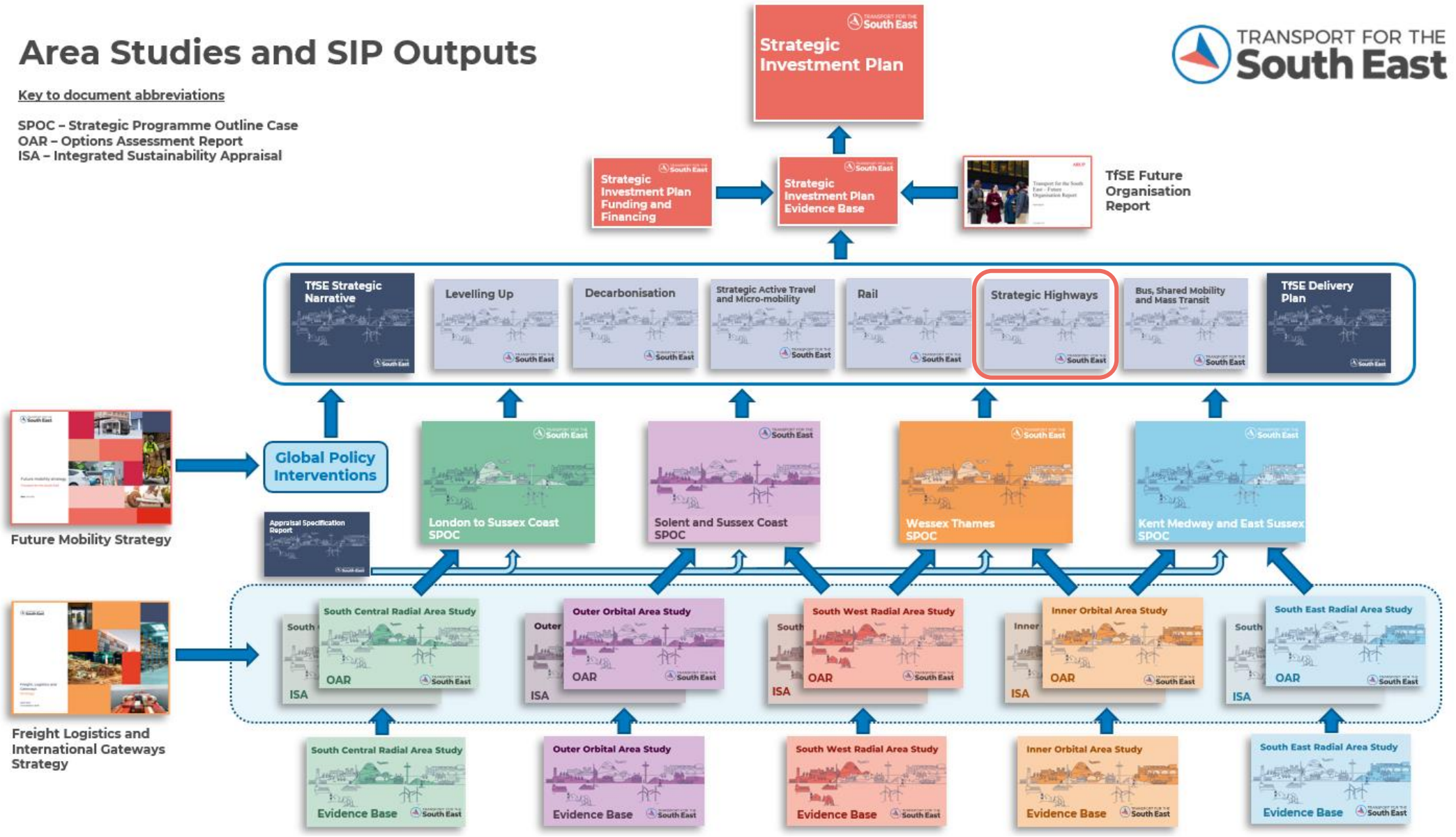
The SIP will include a more detailed examination of potential funding opportunities beyond Central Government, and it will outline how TfSE, its partners, and its constituent authorities will work together to deliver positive change.

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 Strategic Investment Plan is an integral part of the Transport Strategy development process, articulating the case for investment and a delivery plan to 2050.

A Draft SIP is being published for a 12 week public consultation from 20 June 2022. A final version of this document is expected to be adopted by TfSE's Partnership Board early in 2023.

Area Studies Outputs

Figure 1.1: TfSE Area Studies and Strategic Investment Plan Document Hierarchy



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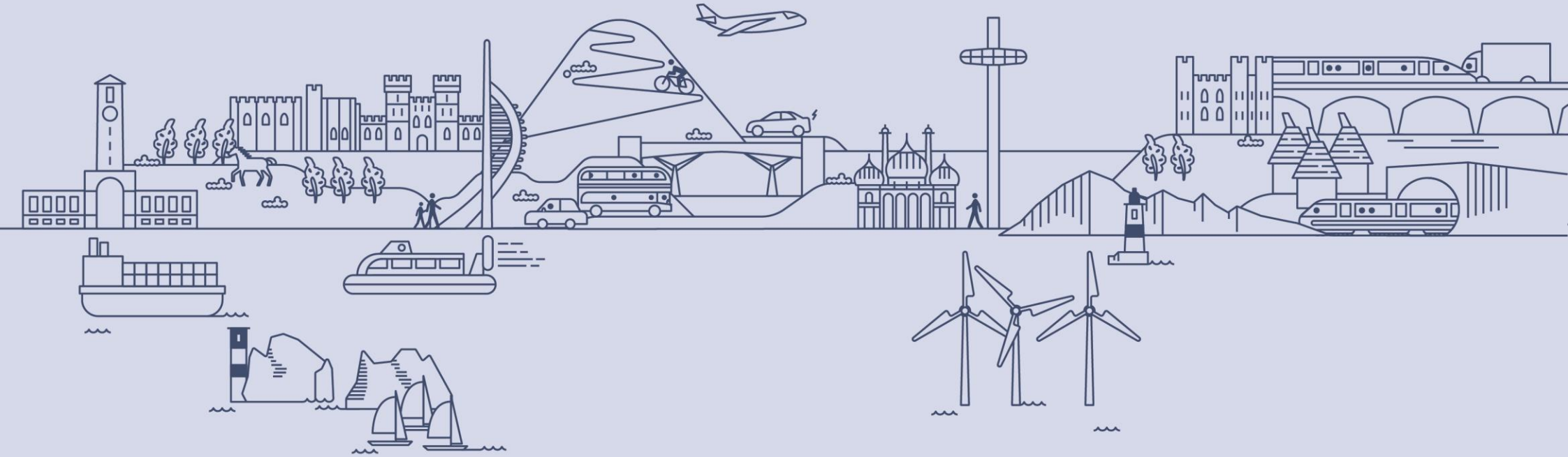


Part 2: Context

The Importance of Highways

Highways and the modern economy

Since the Romans introduced the first programme of planned road-building, following their invasion in 43AD, roads have had an important role in enabling the transport of goods and people. Today's highways remain at the core of our transport systems with each and every person reliant on highways to go about their day to day life, whether to travel by car, bus, cycling, or walking and wheeling, or to access railway and bus stations/stops. Highways also facilitate freight and business and allow people to access goods and services or to receive them at home.

An efficient, safe and reliable highway network is therefore essential to modern society, and this reality is unlikely to change despite the fact that increased highway usage can exacerbate global warming, environmental impacts and safety concerns. Our thinking around highways investment needs to reflect this reality. Highways per se, are not necessarily bad, but it is the way in which they are used that can be a cause for concern. In planning future highways investment we then need to look wider and consider highways as multi-modal movement corridors, providing for journeys by electric and hydrogen powered vehicles, bus, and all forms of active travel.

A need for continued investment

We will need to continue to invest in highways as they will remain an essential component of the transport system. Some new highways will be needed to open up housing and employment developments, and there will be a need to improve and maintain existing roads. Particularly for more rural locations with limited transport options, highways based travel will also remain the most convenient mode of travel. However, whilst investing, we must also ensure that schemes are designed and delivered in ways that minimise their impact. There are a number of underlying principles that should guide future investment:

- Make more efficient use of existing assets.
- Investment should not focus on adding endless capacity, but should be directed towards targeted interventions and a multi-modal approach, supporting mass transit and active travel.
- Focus should be on schemes that provide resilience and safety benefits, support freight movements, and provide segregation between longer strategic and shorter more local trips.

The challenges

Furthermore, it has to be acknowledged that the construction and use of highways have the potential to generate carbon emissions, undermine air quality, impose severance on communities, and in some places, increase the number of collisions and affect road safety. Their development has also been shown to induce demand if they are expanded in isolation.

Whilst seeking an integrated multi-modal solution, reallocating space between those using cars, public transport and active travel modes will be challenging, particularly in already constrained town and city centres.

To address these challenges considered care will be needed to ensure that the right solutions are provided in the right places.

How highways will be paid for in future also needs urgent debate. The revenue lost from Vehicle Excise Duty and fuel duty as we move to electric vehicles will need to be replaced, but in doing so, we will need to carefully considered the relative costs of the car versus public transport.

Many of these funding related challenges are considered further in this plan.

The Role of Highways in the Region

Government policy

Aspects of government policy can, appear as contradictory. On the one hand, the government has an ambition to deliver net-zero carbon emissions by 2050, which requires the complete decarbonisation of the road fleet. On the other hand, the government is keen to promote economic growth, housing (to reduce the cost of housing), regeneration, and "levelling up". This will drive a need for highway expansion (and therefore highway demand) in many cases.

At a tailpipe level, net zero emissions by 2050 in the UK, is achievable for private cars and taxis, but there are challenges for larger vehicles, and if gas continues to feature in the UK's electricity provision, then some kind of offset will be required to achieve net-zero.

Responding to these pressures the government is ambitious in wishing to promote bus and active travel modes. **Gear Change** published in in 2020 set out a bold vision for cycling and walking, and outlines the Department for Transport's (DfT) plans to revolutionise active travel with a £2 billion investment. Gear Change was published alongside **Local Transport Note (LTN) 1/20**, and marks a step-change for cycle infrastructure design and planning in the UK. A key message **underpinning** these policies is that cycling and non-car modes must no longer be treated as an after thought, and should instead by seen as a viable a means of everyday transport.

Similarly, DfT's **National Bus Strategy, *Bus Back Better***, published in 2021 places requirements on local transport authorities to work in partnership with operators to identify ways of enhancing the bus network and increase patronage by a range of interventions including bus priority and bus rapid transport schemes, service enhancements (e.g. new routes, improved frequencies and longer operating hours), reducing fares and complementary measures such as parking demand management.

Government owned organisations such as National Highways, formerly Highways England, and local highway authorities have important responsibilities for building and maintaining the Strategic Road Network (SRN) and Major Road Network (MRN) respectively. They too have ambitious net zero carbon plans both through Local Transport Plans and wider policies. National Highways, for example, is committed to being a **Net Zero Carbon Company by 2050** (2040 for Maintenance and Construction emissions). It is also supports a sustainable future in which road travel is vital to enabling a thriving net zero economy.

National Highways role in route strategy development also seeks to demonstrate how to connect the country whilst ensuring that the SRN is environmentally sustainable and resilient to climate change.

an organisation National Highways are also adopting the **PAS2080 Carbon Management in Infrastructure Standard** and will demonstrate that they have considered all interventions during planning stages with every effort being made to avoid negative impacts and maximise environmental benefits throughout the lifecycles of schemes.

Clearly such ambitious objectives will conflict in some areas. The key takeaway is that highway development over the next few decades will be locationally driven. There will be situations where the right answer is to do nothing (or even regulate/down-grade highway provision for private vehicles), and there will be situations where larger scale interventions may be the best long-term solution. National and Local Government policy then will play out through a range of policy levers and funding routes and TfSE, working with partners, will seek to best support the delivery of these wider policy agendas via the delivery of its transport strategy.

The Role of Highways in the Region (contd.)

Current highway network

Highways have a critically important role to play in helping TfSE deliver its strategy as without interventions to maintain and enhance the highway network, we would be unable to achieve our vision and goals for the South East.

There are over 24,000 miles of highway in the TfSE area, including:

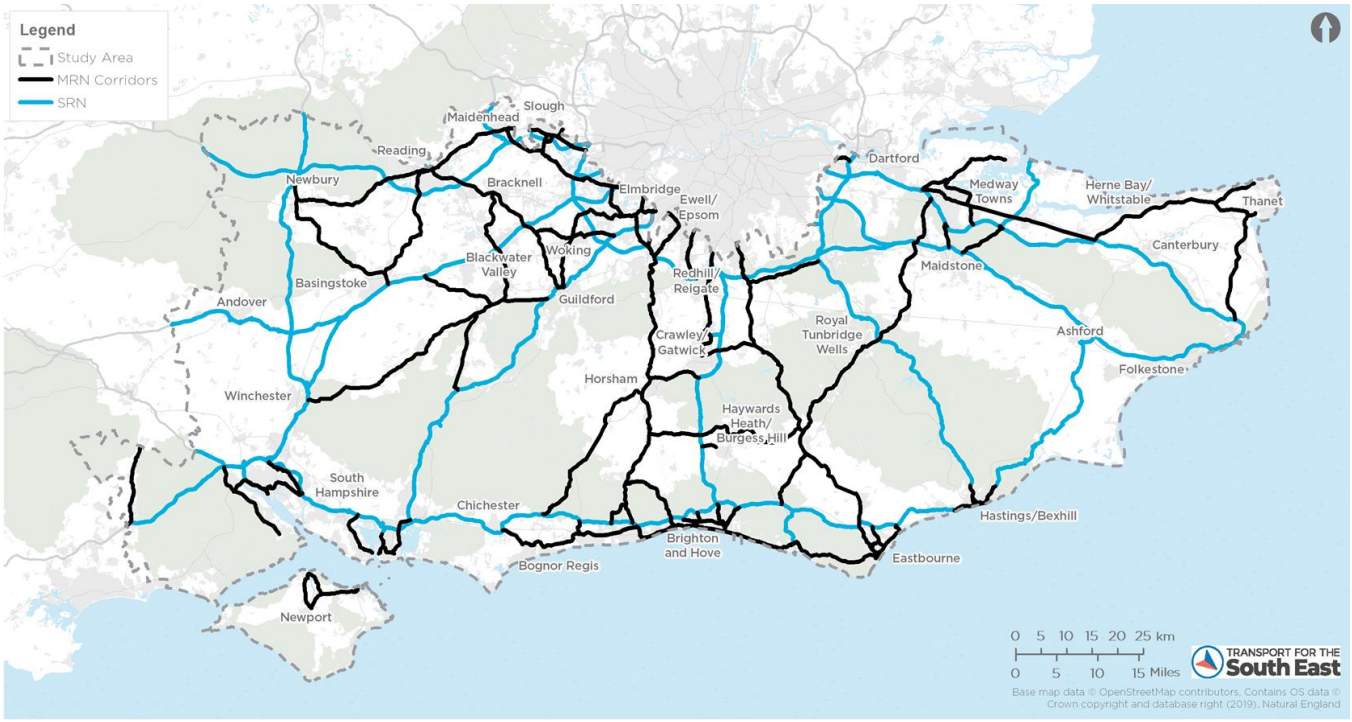
- 704 miles of Strategic Road Network (SRN) – motorways and trunk roads – operated and maintained by National Highways; and
- 745 miles of Major Road Network (MRN) – the most economically important A class roads - managed by our 16 local highway authorities, alongside their local roads.

A map showing the SRN and MRN across the TfSE area is shown in **Figure 2.1**.

Highways carry over 95% of current trips, including active travel, bus, freight, and private cars. Looking further ahead, we envisage highways will support significant growth in active travel and mass transit users.

The importance of having a resilient highway network has become particularly clear in recent years as the freight and logistics industry has had to adapt to changes brought about by the Covid-19 pandemic and learning to live with Covid, and new trading relations between the UK and EU.

Figure 2.1: The Strategic and Major Road Networks in the TfSE Area



The Role of Highways in the Region (contd.)

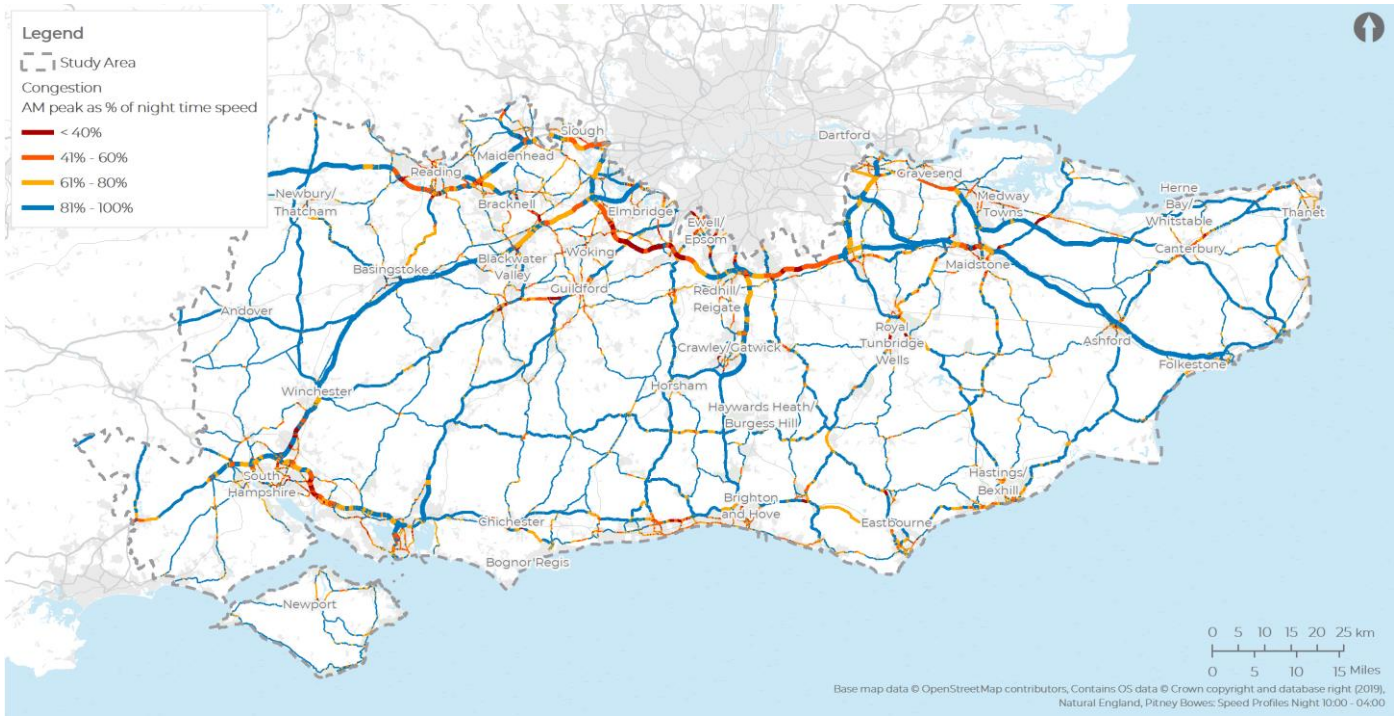
Current highway network (contd.)

Current transport demand represents significant challenges for the transport network, and significant parts of the highway network experience severe congestion during peak hours, impacting reliability and transferring traffic onto less suitable roads. The current levels of congestion on the TfSE road network are shown on the map in **Figure 2.2**.

The TfSE area's radial SRN generally provides an adequate level of connectivity but regularly suffers from congestion. The TfSE area's orbital SRN is much sparser than its radial routes, particularly between the M20 and A3 corridors. This places significant pressure on the parts of the M25 and A27/A259/A2070 corridors that lie to the north and south of Gatwick Airport. The Major Road Network therefore supports a significant proportion of inter-urban traffic on the South East's east-west corridors. There are hotspots of congestion and poor reliability across these orbital corridors.

The highway network also serves a very large portion of local journeys in the South East. These range from urban corridors that connect residents to economic hubs such as Brighton city centre, through to rural roads that connect more remote communities to the wider economy and transport network.

Figure 2.2: Highways Congestion



Having the SRN and MRN pass through so many of our urban areas, while providing high-capacity routes, typically, and good connectivity, creates issues of congestion, community severance, road safety, air quality, noise and carbon emissions. In our rural areas, particularly with the SRN, similar impacts with most significant concerns regarding safety, noise and impacts on the environment and landscape.

Each route faces unique challenges related to capacity, connectivity, reliability and safety. There are opportunities for many of these routes, particularly those serving urban areas, to look again at the balance of road space provided to private cars, public transport, and active transport modes.

The Role of Highways in the Region (contd.)

Forecast growth in road traffic

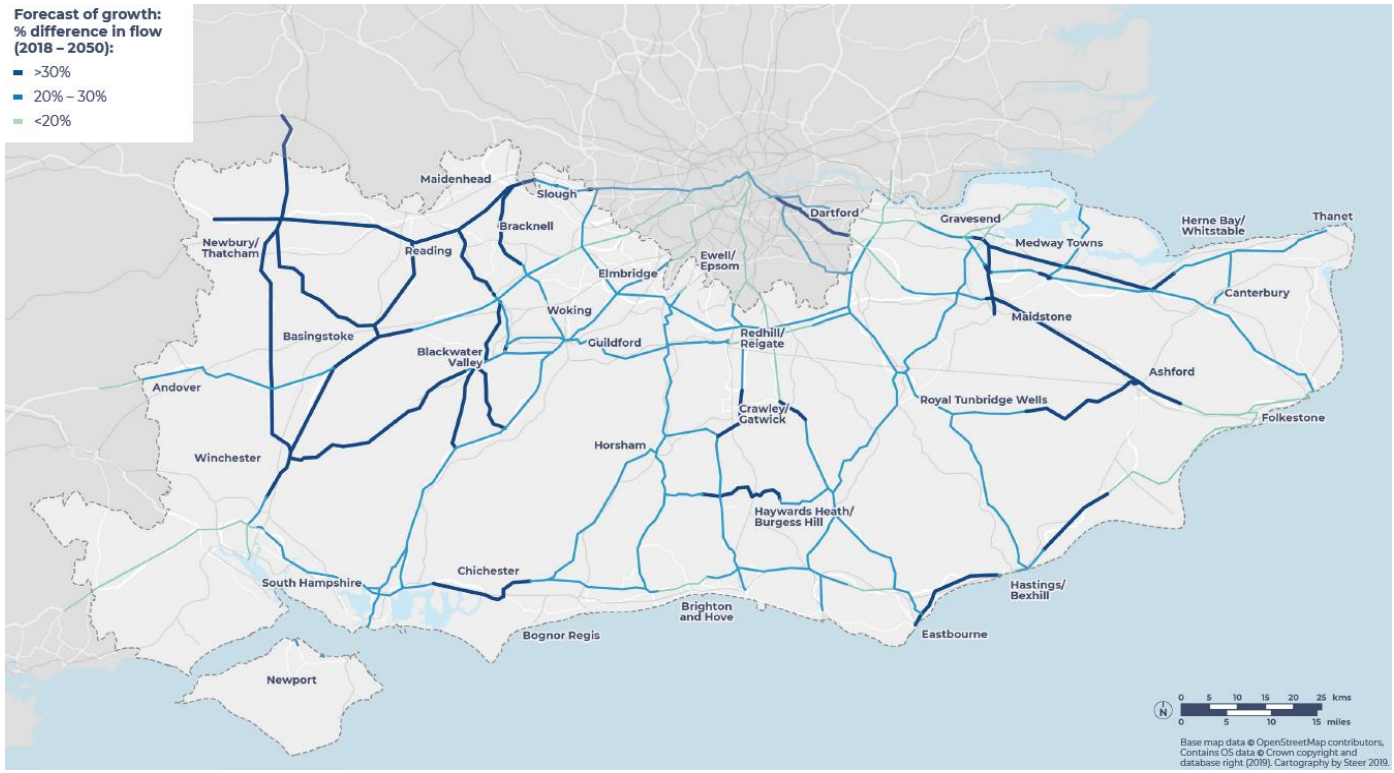
The Department for Transport's current forecasts indicate a 15% increase in trips in the South East by 2050, based on an unconstrained (albeit unrealistic) scenario.

The greatest levels of growth align with the areas with the greatest planned housing growth. This forecast growth on the SRN in the TfSE area, and some MRN links, is shown on the maps in **Figure 2.3**.

TfSE's strategy therefore necessarily reflects these policies, but makes it clear that it will not be desirable or possible to cater for the levels of increased road traffic inherent in the DfT's forecasts. It instead, adopts an approach, based on 'decide and provide', as distinct from 'predict and provide' to plan for future transport needs. Such an approach will involve making best use of existing network capacity and ensuring the highest quality environmental mitigation to be part of scheme.

This more sustainable approach to Highways investment is considered further in the next section.

Figure 2.3: Forecast growth in road traffic (based on DfT forecasts up to 2050)



TfSE's Approach to Highways in the Region

TfSE Approach to Highways

Our approach to the development of highways in the South East is to adopt a multi-modal, supply/demand led, and integrated approach to transport planning. This will adopt the following broad principles and be underpinned by the context for planning outlined in page 12.

- **Decide and Provide**: Our approach to the development of the highway network is to define a vision for how we wish to see it support our economy and communities in the future, and work backwards from this future vision to today. This is in contrast to traditional approaches to highway planning, which have been based on "predict-and-provide" i.e., extrapolating current traffic growth trends to continuously add capacity.
- **Multi-modal:** We expect one of the greatest opportunities for delivering a step change in mass transit provision will be through enhancing bus services and, in some cases, delivering Bus Rapid Transit infrastructure and services. Similarly, the greatest opportunity for boosting active travel is through targeting short trips in largely urban areas, which will include enhancing active travel provision on multiple highway corridors. This will include delivering interventions on the highway network that support public transport (e.g. bus prioritisation) and active travel (e.g. cycleways).
- **Highest quality and environmental mitigation and seizing opportunities:** We recognise highways interventions will have some impact on the natural (and potentially built) environment. Our Transport Strategy strongly supports the principle of biodiversity net gain and, in more general terms, high investment in mitigating the worst effects of highway construction, maintenance, and operation; and seizing opportunities where new infrastructure is developed to enhance biodiversity. This may mean costlier options (with higher levels of mitigation) may be more suitable than notionally higher "Value for Money" alternatives
- **Integrated planning:** Spatial planning plays a key role in driving demand for car journeys. In general, isolated, sparsely populated settlements with few services will inevitably generate more highway demand than denser developments located closer to services and public transport options. This may not be achievable everywhere in South East England, but these principles should be embedded into spatial planning where feasible.
- **Managing Supply and demand:** In addition to optimising the right "supply" of highway infrastructure, we see scope for a greater role in managing demand. This can be achieved through a range of interventions, including: road space regulation/reallocation, clean air zones, congestion charging, parking charges, workplace car park levies, spatial planning (particularly car parking provision), and national road user charging. The latter intervention is emerging as the best candidate for securing sustainable funding for highways as (and when) the revenues raised from Vehicle Excise Duty and Fuel Duty diminish as the road fleet gradually converts to electric vehicles. This will ensure we are able to make best use of existing network capacity and optimise our use of future network capacity as the network develops.

The Future Highways Network

TfSE's transport strategy envisages a South East where villages, towns and cities thrive as successful places, where people can live and work with the highest quality of life. Transport networks that simply aim to provide the most efficient means of moving along a corridor have the potential to bring a wide range of damaging consequences, particularly socially and environmentally.

The transport network therefore has competing, dual priorities. On the one hand it must ensure that people can efficiently and easily move from one place to another. On the other hand, however, it must also ensure that 'places' are protected and ideally enhanced.

The best way to ensure that this occurs is to develop a transport network that considers both 'place' and 'link' functions. Some parts of the transport network are designed to fulfil 'link' roles while other parts contribute more to a sense of 'place'. A diagram illustrating the difference between these functions is provided in **Figure 2.4**.

Areas with high 'place' functions are areas such as town and city centres where 'active' modes, such as walking and cycling, should be prioritised over motorised forms of transport. This will help to enhance the environmental quality of these places, ultimately ensuring that they can continue to fulfil their role as the focus of their communities.

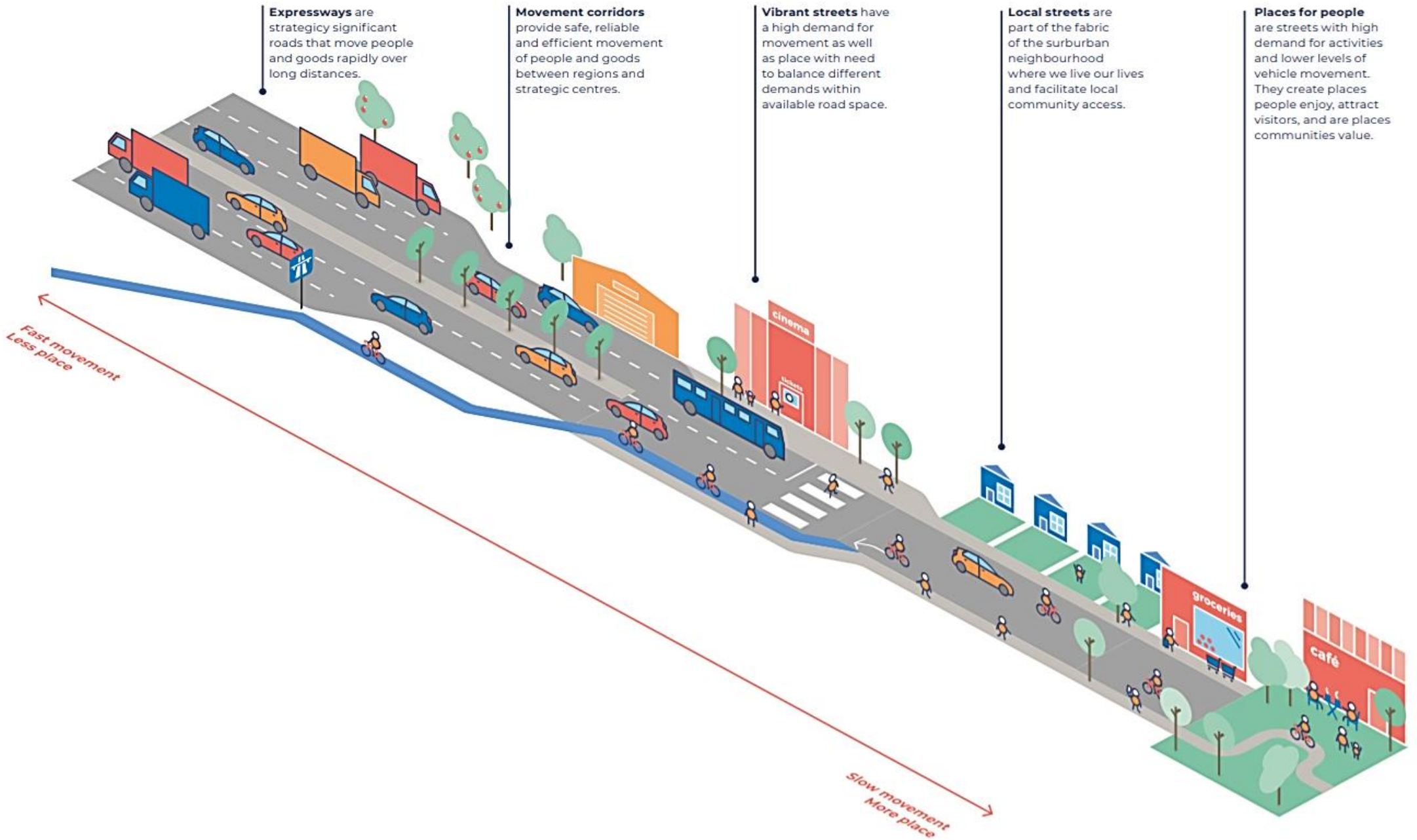
In contrast, sections of the transport network with a high 'link' function must allow journeys to move as efficiently as possible along them. Motorways and high-speed rail lines such as HS1 are examples of this function, as these enable high volumes of vehicles to move through corridors as quickly as possible while minimising contact with vulnerable users such as pedestrians and cyclists.

High speed and low speed components should be clearly segregated from each other. For example, it is more appropriate for long distance rail services to use high speed railways (such as HS1) while stopping services should focus on slower corridors. Similarly, pedestrians and cyclists should ideally be kept far away from the Strategic Road Network and other high-volume roads.

The most optimal transport network is one where traffic flows are aligned to their link function, and where conflicts between user types are minimised to ensure the efficient and safe operation of the transport network. This approach means there will be a case, in some places, for new relief roads to divert heavy traffic (especially freight) away from communities and onto the Strategic Road Network.

The application of the Movement and Place Framework will require compromise. To ensure the best outcome for both movement and place, the process must be as inclusive and exploratory as possible, including looking at a range of options with experts from different disciplines and key stakeholders as well as those who use the space.

Figure 2.4: Movement and Place Framework



Current Investment Context – Strategic Road Network

Strategic Road Network (SRN)

The SRN is the responsibility of National Highways the government company charged with operating, maintaining and improving England's motorways and major A roads. Their ambition is to ensure that strategic roads – motorways and trunk roads – are dependable, durable and, most importantly, are safe.

Future road investment plans are progressed under a Road Investment Strategy (RIS) for strategic highways. The **Road Investment Strategy for 2020 – 2025 (RIS2) i**s the government's long-term strategy for the management and improvement of the SRN. The DfT's RIS2 and again in the **National Highways 5 year Delivery Plan 2020-25** identifies the following schemes – shown in **Table 2.1** - as either committed for Road Period 2 or identified as a pipeline to be considered as potential options for RIS3. These commitments need to be taken into account in assessing any future highway improvement need.

RIS 3 Investment Plans

National Highways is also required, as a condition of its operating licence, to periodically prepare and publish route strategies covering its whole network. The route strategies provide an evidence base on the state and performance of the SRN, the future challenges it faces and an outline of operational and investment priorities.

National Highways has commenced work on the next generation of route strategies that will inform the government's plans and priorities for RIS3. RIS3 covers the third road period, from April 2025 to 2030 and will set out the investment and performance requirements for the South East that National Highways must deliver. The following **RIS3 Pipeline** schemes are identified, but not committed, for the region:

- A259 Coast Road
- A27 Lewes to Polegate
- A27 Chichester Improvements
- M27 Southampton Access
- A31 West of Ringwood

Table 2.1: RIS2 Schemes in the TfSE Area

Scheme Number	Scheme	Status	Start of Works	Open for Traffic
S7	M4 Junctions 3-12 Smart Motorway	Under Construction	Started	2022/2023
S29	M27 Junctions 4-11 Smart Motorway	Under Construction	Started	2022/2023
S31	M27 Junction 8	Committed for RP2	2021/2022	2024/2025
S10	A2 Bean and Ebbsfleet	Committed for RP2	Started	2022/2023
S32	A31 Ringwood	Committed for RP2	2021/2022	2022/2023
S11	A249: Swale Transport Infrastructure (HIF)	Committed for RP2	2022/2023	2023/2024
S33	A27 East of Lewes Package	Committed for RP2	Started	2022/2023
S12	M2 Junction 5	Committed for RP2	2020/2021*	2024/2025
S35	A27 Arundel Bypass	Committed for RP2	2023/2024	2024/2025
S13	M25 Junction 10	Committed for RP2	2021/2022	2023/2024
S37	A27 Worthing and Lancing Improvements	Committed for RP2	2024/2025	RP3*
S23	M3 Junction 9	Committed for RP2	2023/2024	RP3*
S6	M25 Junctions 10-16 Smart Motorway	Smart Motorways Subject to Stocktake	2022/2023	RP3*
S26	M3 Junctions 9-14 Smart Motorway	Smart Motorways Subject to Stocktake	Started	Paused

* Start of works subject to change

* RP3 = Roads Period 3 (2025 - 2030)

Source: Road Investment Strategy 2: 2020-2025 (Department for Transport, 2020) and National Highways engagement

- A404 Bisham Junction
- A3/A247 Ripley South
- M3 J3/A322
- A303/A34 Bullington Cross
- A303 Corridor
- A21 Safety Package (accelerated for delivery into RP2)
- A21 Pembury to Hastings
- A2 Dover Access
- A2 Brenley Corner

TfSE can influence RIS3 and subsequent plans through consultation and publication of its Strategic Investment Plan and as a key stakeholder for National Highways / Department for Transport.

Current Investment Context – Major Road Network

Major Road Network (MRN)

In December 2018, the Government published its response to a consultation setting out proposals for the creation of an MRN. The MRN forms a tier of the country's busiest and most economically important local authority 'A roads', sitting between the national SRN and the rest of the local road network.

Sub-national Transport Bodies (STBs) were identified as being well placed to provide strategic direction and prioiritsation of interventions on the MRN – "Major Road Network Schemes" and "Large Local Major Schemes (LLM)" – as well as coordination for the MRN programme.

STBs were tasked with providing advice to government on the regional priorities for their areas, working with their partners and constituent members. This included consulting with local and combined authorities (including planning authorities), LEPs, local MPs and National Highways to ensure collective decision making on the region's top priority recommendations for MRN investments. DfT set out five central objectives for the MRN, which schemes should meet, as shown in **Table 2.2**.

Table 2.2: MRN / LLM Scheme Selection Criteria

Objective	Criteria
Reducing congestion	Alleviate congestion
	Take account for impacts on air quality, biodiversity, noise, flood risk, water quality, landscape and cultural heritage sites
Support economic growth and rebalancing	Industrial strategy: supports regional strategic goals to boost economic growth
	Economic impact: improve ability to access new or existing employment sites
	Trade and gateways impact: improve international connectivity, for example access to ports and airports
Support housing delivery	Support the creation of new housing developments by improving access to future development sites and boosting suitable land capacity
Supporting all road users	Delivering benefits for public transport and non-motorised users, including cyclists, pedestrians and disabled people
	Safety benefits: Ability to reduce the risk of deaths/serious injuries for all users of the MRN
Supporting the SRN	Improved end to end journey times across both networks
	Improved journey time reliability
	Improved SRN resilience

MRN and LLM Priority Schemes

In March 2022, DfT sought the assistance of STBs in carrying out a review of the MRN and LLM programme. The outcome of that review is awaited, however TfSE has advised DfT that the following 13 schemes are priorities.

Schemes at full approval stage

- A284 Lyminster Bypass (West Sussex)
- Redbridge Causeway (Hampshire)

Schemes at OBC development stage

- A22 Corridor Package (East Sussex)
- A259 (King's Road) Seafront Highway Structures ('Arches') Renewal (Brighton & Hove)
- A28 Birchington, Acol and Westgate-on-Sea Relief Road (Kent)
- A259 Bognor Regis to Littlehampton Enhancement (West Sussex)
- A326 Capacity Enhancement (Hampshire)

Schemes at SOBC development stage

- A259 South Coast Road Corridor (East Sussex)
- Northam Rail Bridge Replacement and Enhancement (Southampton)
- City Centre Road (Portsmouth)
- A31 Farnham Corridor, formerly A31 Hickleys Corner Underpass, Farnham (Surrey)
- A229 Blue Bell Hill Junction Upgrades
- A33 West Quay Road Realignment (Southampton)

Accessing international gateways and strategic freight movement

Freight and International Gateways

TfSE has developed a Freight Logistics and Gateways Strategy. In keeping with the wider TfSE strategy this recognises that Freight is essential to the wider success of the UK, impacting over 200,000 businesses. The South East transport and logistics sector generates a GVA of over £8 billion per year and the region operates as a Gateway nationally, with long haul freight particularly important.

With an estimated 39% increase in port tonnage by 2050, and with the region also being a significant freight generator, the area includes several nationally important freight corridors, mainly those serving the Gateways but also including the M25. However, road freight corridors suffer from congestion and a lack of alternative / diversionary routes. HGV traffic in the area is also forecast to grow at more than twice the UK average and rail freight corridors have limited spare capacity.

Future Freight Issues

Issues identified on the Strategic Road Network and connecting local roads are often partially caused by and exacerbated by national inter-urban freight movements and access to and egress from key gateways.

For example, long-distance freight flows from manufacturing hubs in the North of England and Midlands to key markets in the Solent and other conurbations of the South East, as well as to Port of Southampton and cross-Channel ports/terminals.

The South East's major international gateways are the nation's major international gateways. These include:

- **ports:** Port of Dover, Port of Southampton, Portsmouth International Port, Port of Shoreham, Newhaven Port, and ports along the Thames Estuary and River Medway;
- **airports:** Gatwick Airport, Southampton Airport, and on the border, London Heathrow Airport; and
- **rail:** Eurotunnel, Ashford International, Ebbsfleet International

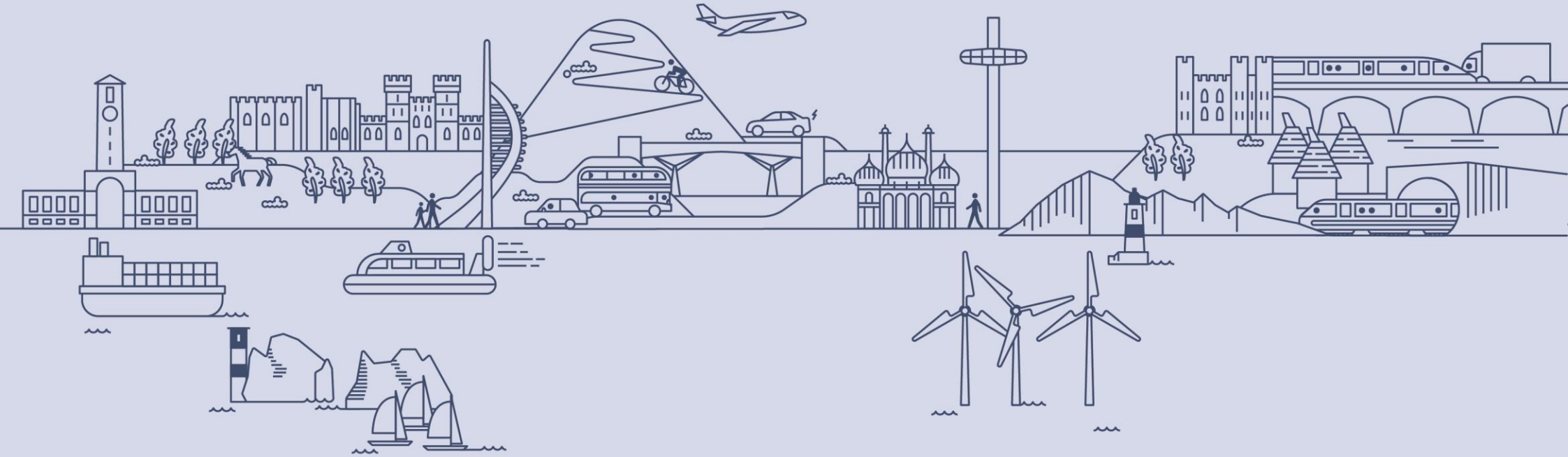
There are recognised issues with the transport networks which provide access and egress to these hubs. Often, a combination of high volumes of traffic/movement associated with different journey purposes or movement types places pressure on networks with limited capacity, particularly where gateways are located in town and city centres or at the nexus of multiple strategic routes.

Where possible, mode shift to more sustainable modes of travel for freight and the movement of people to and from gateways will be prioritised. For freight, this principally means rail and supporting infrastructure, but also: accelerating the use of zero emission vehicles such as hydrogen fuelled HGVs; optimising payloads and minimising empty-running; and operational efficiencies to, from and at the gateways.

For Port of Dover and Eurotunnel Terminal, infrastructure issues are exacerbated by adjusting to new trade and economic relations between the UK and EU. As such, it is not only the physical capacity of the infrastructure that is under review, but the operational workings of the road network, parking and queuing facilities and operations, and the ports and border control functions collectively. This includes long-term solutions to issues currently addressed by Operations Stack and Brock.

Furthermore, the Lower Thames Crossing will provide additional capacity and resilience to the M25 and Dartford Crossings. Accommodating the infrastructure and traffic flows in the South East, particularly for onward travel to and from the cross-Channel ports/terminals will require additional infrastructure, commonly known as the Kent Highways Bifurcation Package.

TRANSPORT FOR THE South East



Part 3: Issues and Opportunities

Issues and Opportunities

The key issues and opportunities affecting the South East's highway network are summarised below:

Carbon: Nationally, transport accounts for 29% of all emissions, and road transport accounts for 92% of the UK's surface transport carbon emissions. Road transport needs to decarbonise if the South East is to reach its and the government's stated goal of net-zero carbon emissions by 2050 at the latest. The current rate of decarbonisation is too slow at present.

Social and environmental impact: Several strategically significant (and busy) highways pass through or close to sensitive environments, such as National Parks, and/or through urban areas, which undermines the quality of life for residents. The Movement and Place framework described above on pages 12 and 13 sets out the "ideal" typology of highway for each context.

Congestion: Several parts of the South East's highway network suffer from regular congestion, which undermines the productivity of the economy (and also undermines the competitiveness of bus, which is as affected by congestion as cars are).

Connectivity: There remain some gaps in the SRN that place communities at a structural disadvantage – including coastal communities that are already among the least prosperous in England. For example, the journey from Ashford to Junction 5 of the M25 takes around 35 minutes to complete on the M20/M26, whereas the journey from Hastings to the same destination via the A21 takes around an hour. These journeys are both around 40 miles in length.

Resilience: There are several areas in the South East where long distance connectivity is "funnelled" through a single highway, with few viable alternatives for motorists caught up in disruption. The M2 and M20 corridors are also subjected to disruption from Channel crossings, which can force heavy traffic onto local roads.

International gateways: The South East serves several of the busiest ports and airports in the UK. While these are generally well connected, there are challenges with managing disruption on some corridors – particularly to Heathrow Airport, Gatwick Airport, Solent Ports and Southampton Airport, and Port of Dover. There is also a need to enhance some local access to support growth in some gateways – notably Southampton and Gatwick.

Freight: A significant portion of UK international trade passes through the South East. For example, one seventh of all pre-Covid/Brexit trade passed through the Port of Dover. Recent experience has highlighted the challenges the logistics industry is facing as the UK "learn to live" with COVID-19 and adapts to new trading relationships with the EU. It is critically important that the highway network has the capacity and resilience to manage future disruption and ensure trade can flow as seamlessly as possible.

Issues and opportunities (continued)

Technology: New technologies present opportunities and challenges for transport – mostly opportunities. Technology is enabling motorists to improve vehicle safety and environmental performance. It is also enabling the delivery of new (generally more sustainable) ways of transport (e.g. electric scooters) and new business models that improve information, accessibility, and choice for travellers. There is one note of caution, however, which is to avoid a situation where technology competes with sustainable travel by promoting ride sharing over traditional public transport (as has occurred in some North American cities).

Agglomeration: The current orientation of the highways network reflects a strong relationship between the South East's major economic hubs and London, but does not leverage opportunities for better linkages and agglomeration between these hubs. Whilst the role of transport in supporting agglomeration may have reduced through higher levels of business and commerce online, our highways still provide essential links.

National strategic connectivity

To better understand the strategic challenges of the Strategic and Major Road Networks in South East England, the TfSE Project Team developed high-level gravity models for Great Britain and for the TfSE area.

This model has been used to identify the largest theoretical latent demand between the 30 largest Built-Up Areas in England and Wales (plus Glasgow and Edinburgh – statistics for built-up areas in Scotland differ from England and Wales). The focus was on the relative 'attraction' of large population centres to each other, rather than on observed flows on highways and railways.

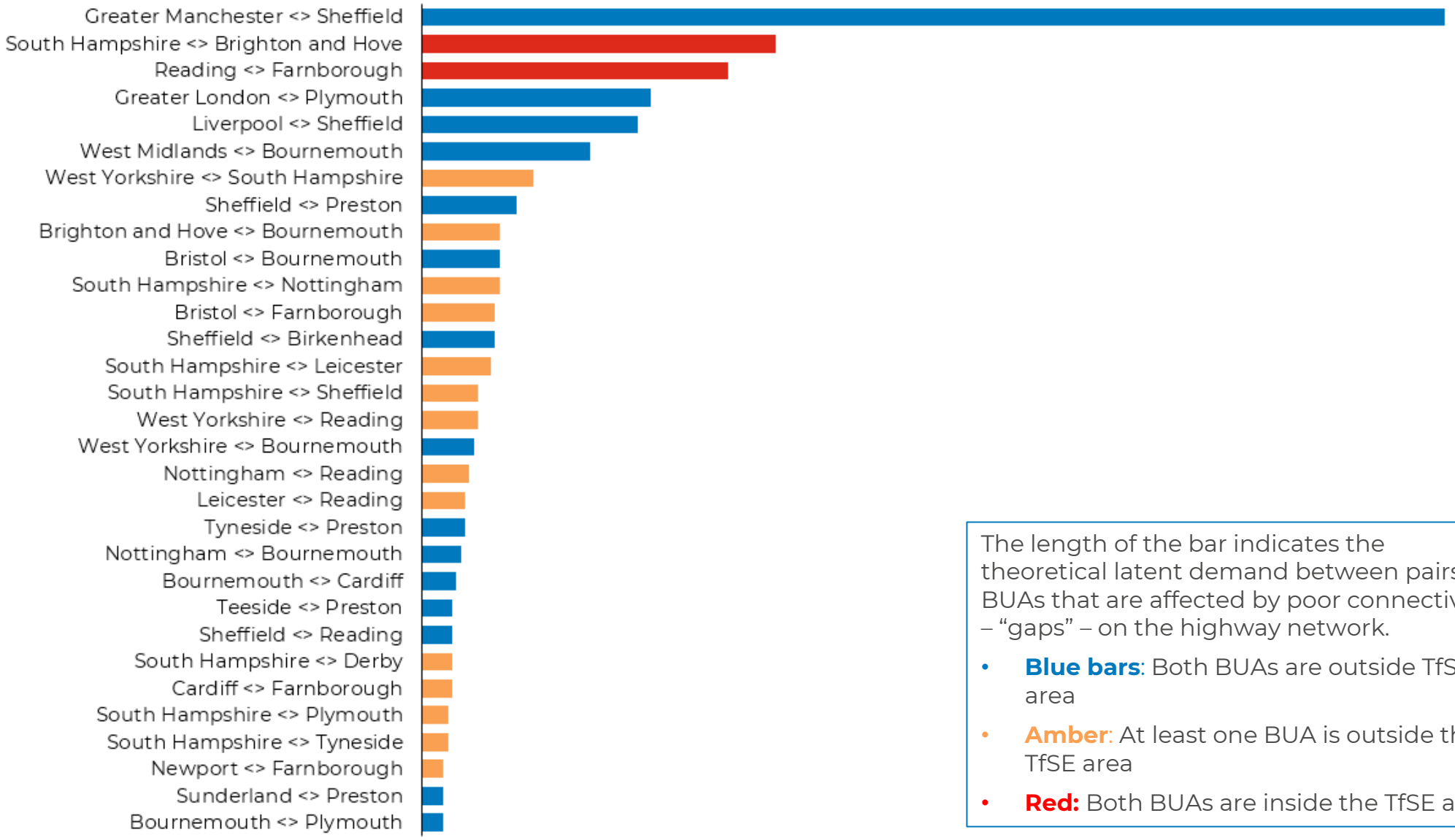
The Project Team then identified the routes on the Strategic and Major Road Network that serve the largest theoretical flows and assessed the quality of the highway network that serves each flow. The focus here has been on quality (i.e. standard of road defined by grade separation, speed, etc.) and not quantity (i.e. how many lanes are needed to accommodate a theoretical flow).

This Gravity Model combined with an assessment of quality of service shows that for the pairs of Built up Areas with the largest relative score, most of the key flows between the largest population are well served by the highway network. They also found flows to London were very well served. However, the team also identified several population centre pairs that, in theory at least, have a high latent demand, but are not served by high quality roads - these can be considered key gaps in the highway network.

Nationally, the most significant of these is between Manchester and Sheffield (see **Figure 3.1**), but the second is between the two largest conurbations in the South East - South Hampshire and the Sussex Coast conurbations, and the third is between the fourth and fifth largest conurbations in the South East - Reading and the Blackwater Valley. The analysis suggests that the South East's Strategic Road Network generally meets the strategic needs of the region, but there are a small number of "gaps" that need to be addressed.

Informing our work

Figure 3.1: Highest National "Gravity" Score Built Up Area (BUA) Pairs with Poor Level of Service



The length of the bar indicates the theoretical latent demand between pairs of BUAs that are affected by poor connectivity – "gaps" – on the highway network.

- **Blue bars**: Both BUAs are outside TfSE area
- **Amber**: At least one BUA is outside the TfSE area
- **Red:** Both BUAs are inside the TfSE area.

Regional strategic connectivity

A similar model was developed for the 30 largest urban centres within the TfSE area.

Again, combining an assessment of the highest gravity scores with poorest quality of level of service on the highway network (see **Figure 3.2**) identifies the following pairs as key gaps.

Summary

Figure 3.3 overleaf summarises the key gaps identified in the highway network from the analysis, corroborated through stakeholder engagement and assessment of empirical data and future year forecasts/estimates.

Local strategic gaps of regional significance are identified in **yellow**.

Nationally strategic gaps are identified in **red**.

Gaps in connectivity to international gateways are highlighted in **blue**.

Opportunities to address these gaps have included multi-modal highway interventions, rail interventions, as well as support for broader policy to manage demand.

Figure 3.4 overleaf provides an example of how a strategic gap – the A27 – identified using the process above has then been taken forward with further analysis for identifying potential Interventions.

Figure 3.2: Highest Regional "Gravity" Score Built Up Area (BUA) Pairs with Poor Level of Service

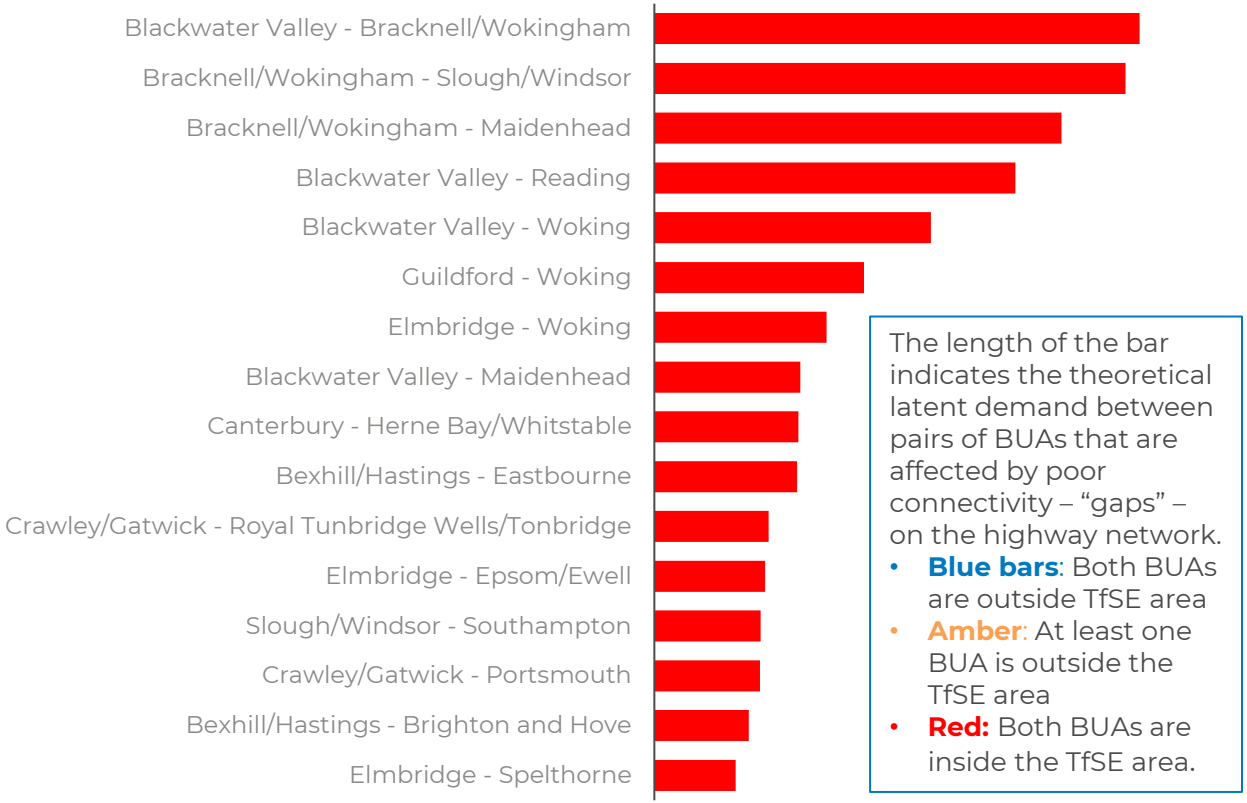
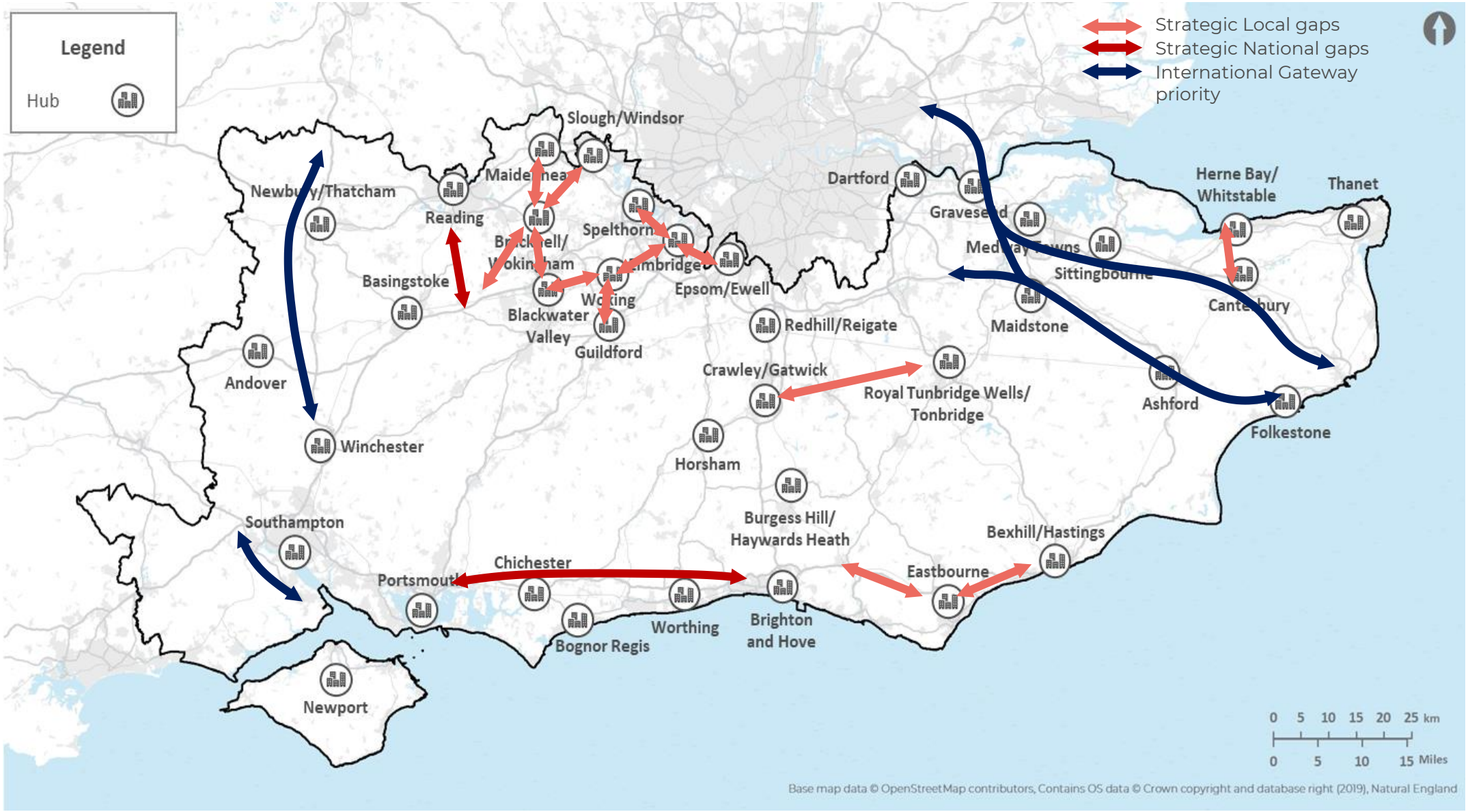
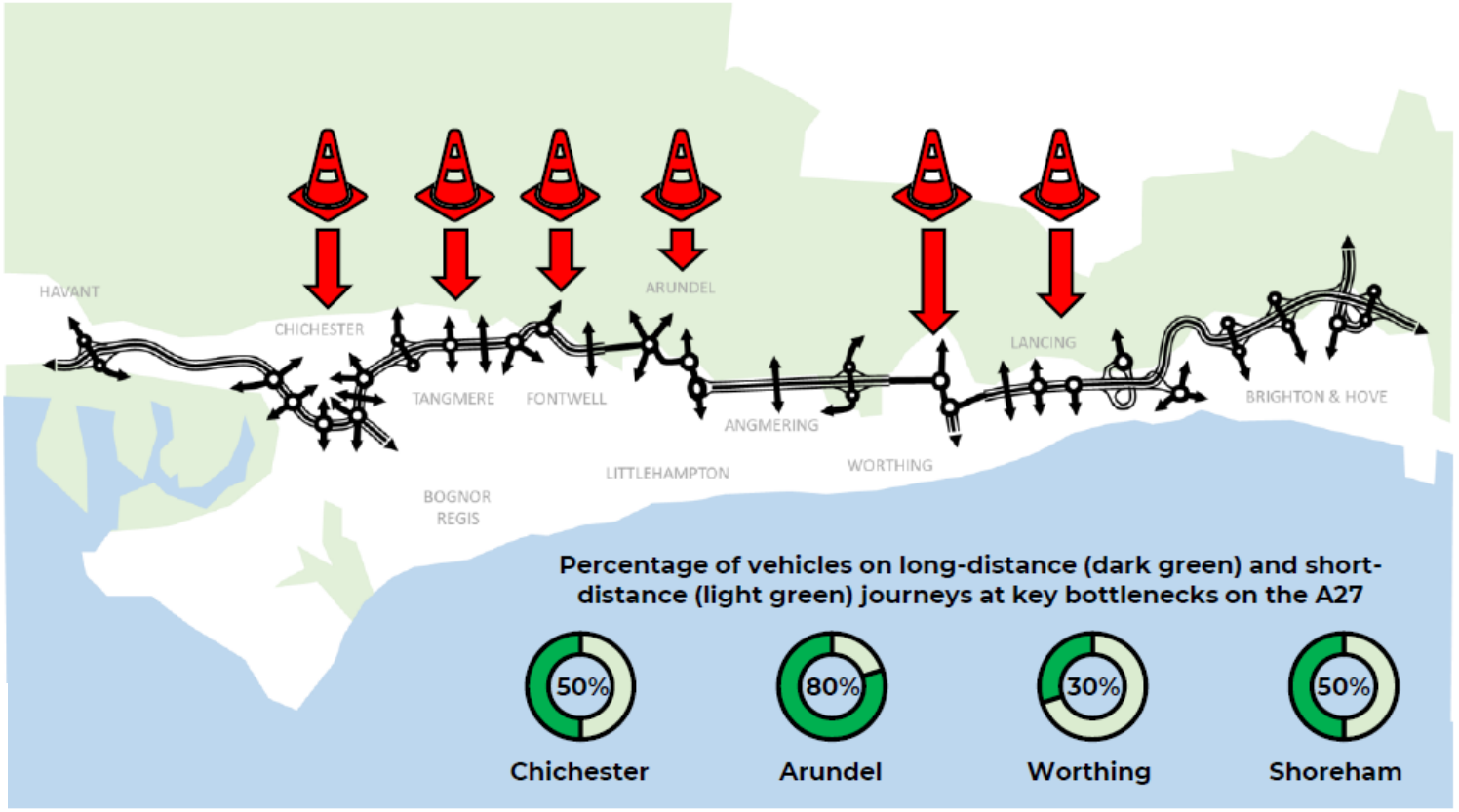


Figure 3.3: Summary of strategic gaps in the TfSE Highway Network



Issues and Opportunities (7 of 7)

Figure 3.4: Example application of analysis – 'A holistic vision for the A27'



Source: Steer and Atkins analysis

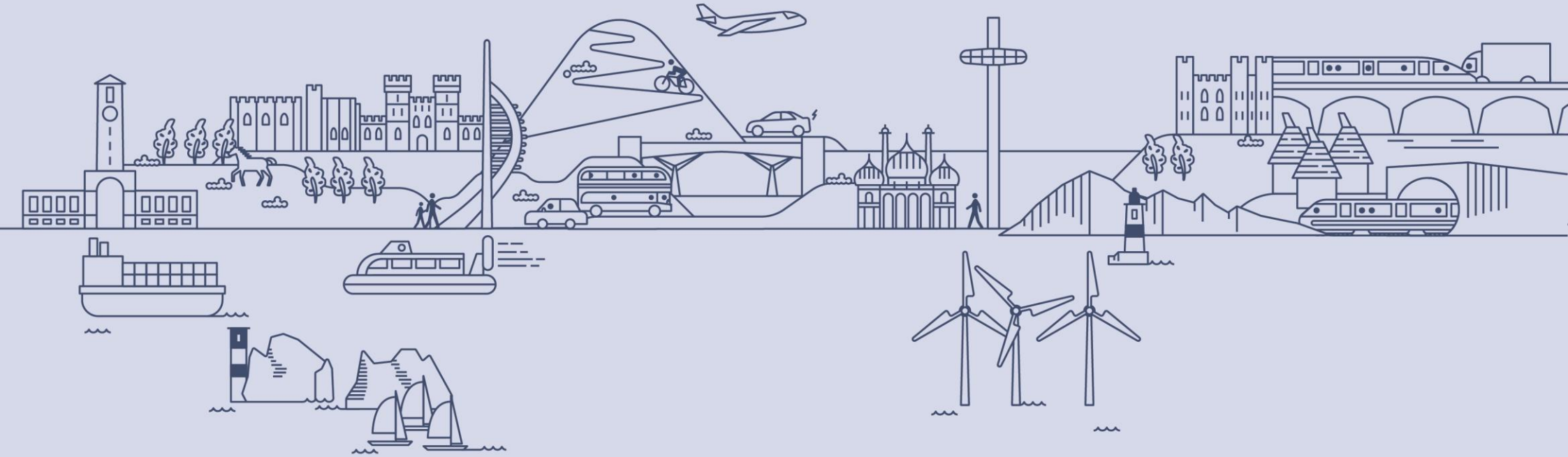
Not about

- Predict and provide
- Continuously adding capacity
- Only motorists
- "Kicking the can further down the road"

Instead, the focus is on

- Protecting landscapes, townscapes, and people
- Supporting regeneration/growth
- Segregating local/strategic traffic
- Unlocking multi-modal opportunities
- Delivering an end-to end solution
- Transparency

TRANSPORT FOR THE South East



Part 4: Vision and Objectives

Vision and Objectives

TfSE Strategy

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

The vision for the South East's highways 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

Interventions in the highway network will be needed to enable the South East to achieve the Vision and Objectives set out in the Transport Strategy.

Without interventions by 2040 many additional large stretches of the transport network of the South East will be severely congested eroding the potential for economic growth in an area by increasing journey times and reducing the efficiency of the transport network. This will result in:

- Housing development will be slowed down, making housing more unaffordable for many.
- Trade and freight flows between the UK and EU will be undermined by poor resilience, increased costs, and supply chains will continue to be placed under stress (undermining wider economic productivity).
- The South East will continue to over reliant on London, and opportunities arising from agglomeration (e.g. pooling of labour markets and services) will not be realised.
- Increase community severance as roads become a bigger barrier to cross through traffic, noise, and pollution.
- Lower carbon alternatives to diesel vehicles (electric vehicles, public transport, active travel, etc.) will be less attractive and the South East will not achieve its net zero carbon goals.
- Congestion will continue to choke towns, blight the natural environment, and undermine opportunities for growth, regeneration. Congestion also risks undermining public transport (by delaying bus journeys) and active travel modes (by undermining the safety of highways for vulnerable users).
- Many of the most deprived areas, particularly those located on the coast in the South East, will struggle to complete with better connected “competitors”.

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
- 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 serve **freight and global gateways**

Role of Highways

Highways can play a significant role in addressing the eight key challenges highlighted in the Strategic Narrative by:

- Enabling the efficient movement of goods and materials
- Underpinning cost effectiveness and viability of manufacturing industries
- Offering opportunities for improving economic growth and GVA
- Providing better access to jobs and employment opportunities
- Improving access to services for communities and to attractions for visitors
- Supporting the development of an improved environment where a focus on place has created opportunities for investment
- Reducing noise and air quality impacts that arise as a result of network congestion

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 highways network, while others are broad but could still be relevant to highways. A list of the key problem statements that could be addressed (at least partially) through highway 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

Highway Specific Problem Statements

- Major highways do not provide effective East – West connectivity
- Major highways run through and/or close to protected areas, undermining the quality of local environments
- Too many major highways pass through densely populated communities, causing noise, pollution, and severance issues
- Highway traffic accessing ports in the area is negatively impacting the environment in town and city centres
- There are congestion, road safety, and air quality “hot spots”, particularly in Town Centres and at major junctions
- Many major highways do not have enough capacity to accommodate planned housing (and airport) growth
- There are too many level crossings with busy railways on major highways along the South Coast
- The M25 South West Quadrant is at capacity
- The Lower Thames Crossing will increase congestion on other parts of the highway network

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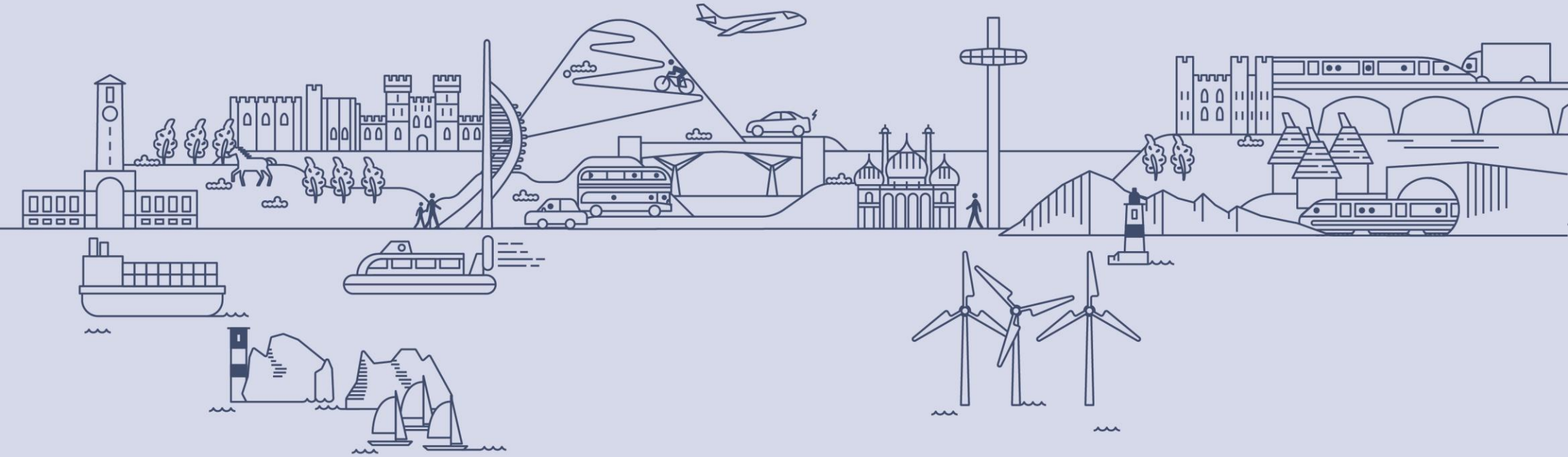


Part 5: Packages of Interventions

Introduction to Packages

Overview

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

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.

Whilst most interventions focus on sustainable modes, targeted interventions to deliver a high-quality east – west connections and more resilient radial highways corridors have been identified. The highways packages are, in themselves, multi-modal. Where identified they support:

- **safer highways**, notably in urban areas;
- **improved access to international gateways**, for passengers and freight, allowing for more efficient trade;
- **de-conflicting of private and mass transit vehicle flows** between local and longer-distance routes; and
- **freed up road space being reallocated** and supported by public transport and active travel improvements, as well as unlocking of housing/regeneration/growth area, and placemaking.

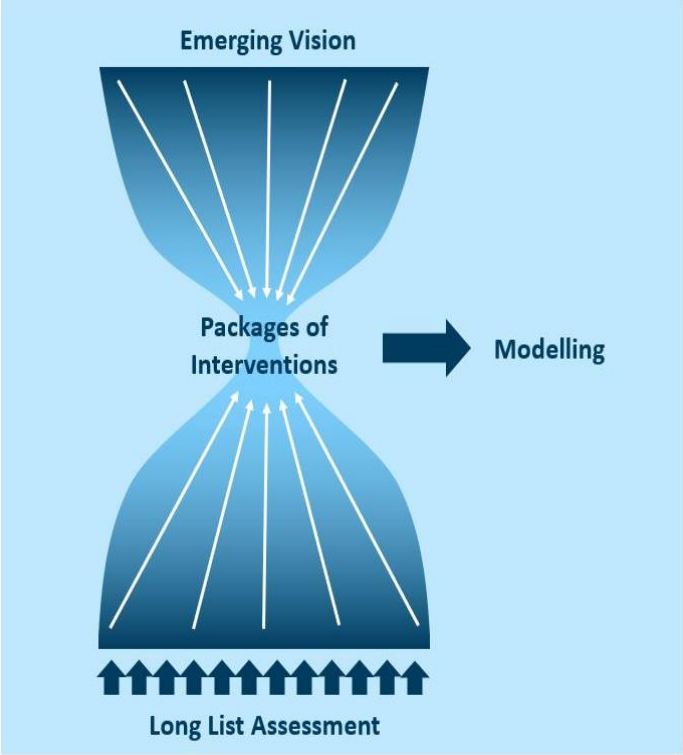
In essence, this reflects both a 'top down' i.e., vision led approach and a 'bottom up' i.e., individual intervention assessment approach. **Figure 5.1** illustrates the essence of this combined approach.

TfSE has used a land use and transport interaction model to simulate the impacts of these four Packages of Interventions. The results from this modelling exercise are presented in **Table 6.1** in **Part 6**. However, some headline outputs are presented on **pages 34 to 37**.

These packages are a step-change away from traditional "predict and provide" capacity enhancements of previous decades. They support our vision and support not only strategic movement of vehicles but our places and communities.

They have been refined to minimise increases in carbon emissions and the impact of these Interventions on the wider environment, but all highway packages do result in small increases.

Figure 5.1: Approach to Package Development



Further mitigation will be needed as these packages and interventions are developed. They will also be complemented by a number of "global" policy interventions, which promote demand management and digital technology to reduce the number of trips, accelerate the decarbonisation of road vehicles, and promote sustainable travel.

Packages of Interventions

The Area Studies Programme has identified the following **Packages of Interventions** for the South East's highways. The Interventions included in these Packages are presented on the following two pages along with a summary map showing key interventions schematically across the TfSE area. This is followed by package summary pages.

Package I: Solent and Sussex Coast Highways

I1	M27 Junction 8 (RIS2)
I2	A31 Ringwood (RIS2)
I3	A27 Arundel Bypass (RIS2)
I4	A27 Worthing and Lancing Improvement (RIS2)
I5	A27 East of Lewes Package (RIS2)
I6	Southampton Access (M27 Junction 2 and Junction 3) (RIS3 Pipeline)
I7	A27 Lewes - Polegate (RIS3 Pipeline)
I8	A27 Chichester Improvements (RIS3 Pipeline)
I9	A326 Capacity Enhancements (LLM)
I10	West Quay Realignment (LLM)
I11	Portsmouth City Centre Road (LLM)
I12	Northam Rail Bridge Replacement and Enhancement (MRN)
I13	New Horsea Bridge and Tipner Bridge
I14	A259 Bognor Regis to Littlehampton Enhancement (MRN)
I15	A259 South Coast Road Corridor - Eastbourne to Brighton (MRN)
I16	A259 Chichester to Bognor Regis Enhancement (MRN Pipeline)
I17	A259 (King's Road) Seafront Highway Structures Renewal Programme (MRN Pipeline)
I18	A29 Realignment including combined Cycleway and Footway
I19	M27/M271/M275 Smart Motorway(s)
I20	A27 Tangmere Junction Enhancements
I21	A27 Fontwell Junction Enhancements
I22	A27 Worthing (Long Term Solution)
I23	A27 Hangleton Junction Enhancements
I24	A27 Devils Dyke Junction Enhancements
I25	A27 Falmer Junction Enhancements
I26	A27 Hollingbury Junction Enhancements

Packages of Interventions

The Area Studies Programme has identified the following **Packages of Interventions** for the South East's highways. The Interventions included in these Packages are presented on the following two pages along with a summary map showing key interventions schematically across the TfSE area. This is followed by package summary pages.

Package N: London - Sussex Coast Highways

- **N1** A22 N Corridor (Tandridge) - South Godstone to East Grinstead Enhancements (LLM Pipeline)
- **N2** A24/A243 Knoll Roundabout and M25 J9A (MRN Pipeline)
- **N3** A22 Corridor Package 2 (Polegate - Halisham New Offline Carriageway) (MRN Pipeline)
- **N4** A2270/A2101 Corridor Movement and Access Package (MRN Pipeline)
- **N5** M23 Junction 8a New Junction and Link Road - Redhill
- **N6** M23 Junction 9 Enhancements - Gatwick
- **N7** A23 Carriageway Improvements - Gatwick to Crawley
- **N8** A264 Horsham - Pease Pottage Carriageway Enhancements
- **N9** A264 Crawley - East Grinstead Dualling and Cylceway
- **N10** A272 Crawley Western Link Road and Cycleway
- **N11** A24 Dorking Bypass
- **N12** A24 Dorking - Capel New Roundabout
- **N13** A24 Corridor Improvements Horsham to Capel (LLM Pipeline)
- **N14** A23 Hickstead and Bolney Junction Enhancements
- **N15** A23/A27 Patcham Interchange Junction Enhancements
- **N16** A26 Lewes - Newhaven Realignment and Junction Enhancements
- **N17** A26 Lewes - Uckfield Enhancements
- **N18** A22 Uckfield Bypass Dualling
- **N19** A22 Smart Road Trial Proposition Study

Packages of Interventions (contd.)

The Area Studies Programme has identified the following **Packages of Interventions** for the South East's highways. The Interventions included in these Packages are presented on the following two pages along with a summary map showing key interventions schematically across the TfSE area.

Package R: Wessex Thames Highways

R1	M3 Junction 9 (RIS2)
R2	M3 Junction 9 - Junction 14 Smart Motorway (SMP)
R3	A404 Bisham Junction (RIS2)
R4	A3/A247 Ripley South (RIS3 Pipeline)
R5	A31 Farnham Corridor (LLM)
R6	New Thames Crossing East of Reading (LLM)
R7	A320 North Corridor (HIF)
R8	M4 Junction 10 Safety Enhancments
R9	M3 Junction 6 - Junction 8 Safety Enhancements
R10	A3 Guildford Local Traffic Segregation
R11	A3 Guildford Long Term Solution
R12	A34 Junction and Safety Enhancements
R13	A322 and A329(M) Smart Corridor
R14	A339 Newbury to Basingstoke Safety Enhancements
R15	M4 Junction 3 to Junction 12 Smart Motorway (SMP)

Packages X & Y: Kent, Medway, and East Sussex Highways Packages

X1	M2 Junction 5 (RIS2)
X2	A2 Brenley Corner Enhancements (RIS3 Pipeline)
X3	A2 Dover Access (Lydden - Whitfield Dualling) (RIS3 Pipeline)
X4	A21 Safety Enhancements (RIS3 Pipeline, brought forward to RP2)
X5	A229 Bluebell Hill Juntion Upgrades (LLM)
X6	A28 Birchington, Acol and Westgate-on-Sea Relief Road (MRN)
X7	A228 Colts Hill Strategic Link (MRN Pipeline)
X8	Digital Operations Stack and Brock
X9	A20 Enhancements for Operations Stack & Brock
X10	Kent Lorry Parks (Long Term Solution)
X11	Dover Freight Diversification
X12	Kent Freight Consolidation Centres
X13	M2 Junction 4 - Junction 7 Smart Motorway (RIS3 Pipeline / SMP)
X14	A2 Canterbury Junctions Enhancements
X15	M20 Junction 3 - Junction 5 Smart Motorway
X16	M20 Junction 6 Sandling Interchange Enhancements
X17	M25 Junction 1a Enhancements
X18	M25 Junction 5 Enhancements
X19	Herne Relief Road
X20	Canterbury East Relief Road
X21	New Maidstone South East Relief Road
X22	A228 Medway Valley Enhancements
X23	A228 Hoo Peninsula Enhancements
X24	Strood Riverside Highway Enhancement and Bus Lane
X25	A259 Level Crossing Removals
X26	A21 Kippings Cross to Lamberhurst Dualling and Flimwell and Hurst Green Bypasses
X27	Hastings and Bexhill Distributor Roads
Y1	Lower Thames Crossing (costings for Kent-side only)

Package I: Solent and Sussex Coast Highways

Overview

This package for the Solent to Sussex Coast area contains interventions that help deliver TfSE's vision for a high-quality highway between the areas' two largest conurbations.

This does not necessarily mean delivering a grade separated dual carriageway – more modest interventions may be appropriate, but a priority is a long-term solution for Worthing. Addressing pinch-points along the A27, but not at Worthing, is likely to increase congestion in the town. Any highway intervention proposed in this package should be designed to de-conflict local and longer-distance traffic, and address safety and air quality issues. They should support (and be supported by) public transport and active travel improvements. Several interventions unlock opportunities to reallocate road-space to active travel and public transport.

This is reflected in modelling analysis that indicates these highways interventions could stimulate almost as many more bus trips on the A27 corridor as private car trips if supported by service enhancements.

The parallel A259 corridor provides a complimentary function alongside the A27 in providing access to coastal communities (Bognor and Littlehampton) from the SRN but also linking coastal communities (Brighton - Peacehaven - Newhaven - Seaford – Eastbourne – Bexhill – Hastings).

Southampton Access M27 Junctions and A326 Capacity Enhancements open up residential and commercial development (e.g. Fawley Waterside) and improve access to the Port of Southampton and the wider Solent Freeport and its growth.

Modelling Results

£170m GVA uplift per annum (by 2050, 2018 prices)

5,000 More bus and car return journeys per weekday

Benefits

- **Safer highways**, notably in urban areas
- **Faster**, more **reliable highway journeys** between Brighton and South Hampshire
- **Improved air quality** in urban areas
- Scope to r**eallocate road-space to active travel and public transport**
- **Reduced impact of road traffic** on the South Downs National Park

TRANSPORT FOR THE South East

Package N: London to Sussex Coast Highways

Overview

Components of the London to Sussex Coast highways package have been designed to de-conflict local and longer-distance traffic, and support safety and air quality objectives. They should support (and be supported by) public transport improvements.

This package includes interventions that support access to international gateways (M23 Junction 9), regeneration areas (Crawley Western Link Road), and placemaking (a Godstone bypass and improvements to the Uckfield bypass to reduce the amount of traffic diverting through the town, unlocking public spaces).

Also included is a new junction on the M23 for Redhill, which could be linked to the A23 and East Surrey Hospital by a new road running near to a nearby aerodrome. This would help relieve pressure on the A217 at Reigate Level Crossing, facilitating more rail services on the North Downs Line.

Several interventions unlock opportunities to reallocate road-space or to create shared road space to active travel and public transport such as A24 Horsham – Leatherhead and East Sussex's A2270/A2101 MRN Scheme.

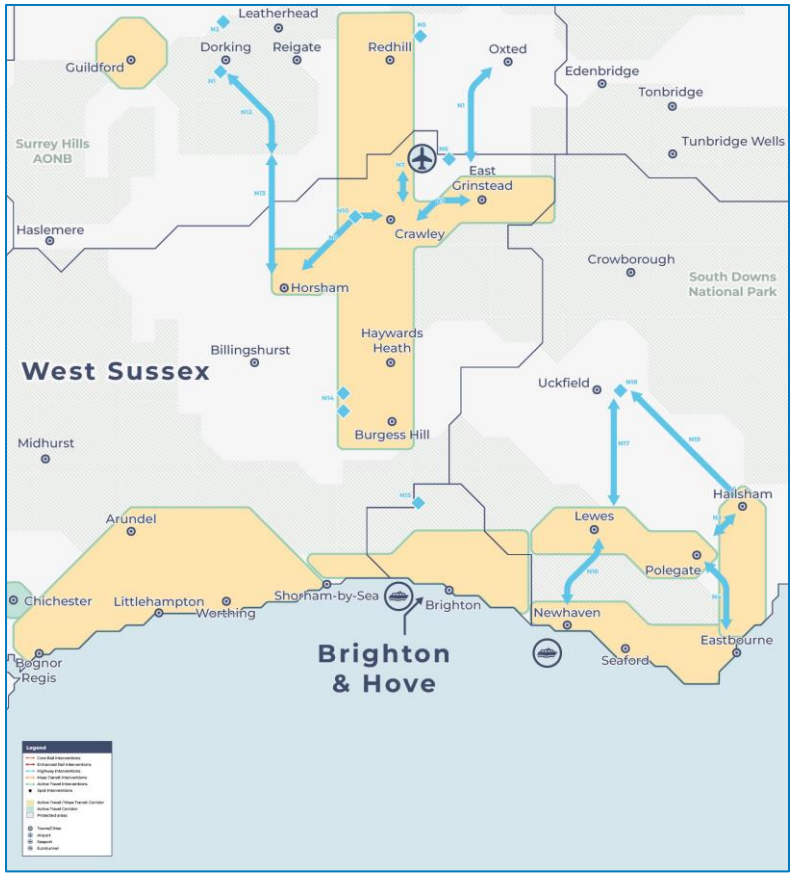
Benefits

- **Safer highways**, notably in urban areas
- A more **reliable** and **resilient** highway network
- **Improved air quality** in urban areas
- Scope to **reallocate road space** to active travel and public transport

Modelling Results

£140m GVA uplift per annum (by 2050, 2018 prices)

5,000 More car journeys per weekday



Package R: Wessex Thames Highways

Overview

The Wessex Thames highways package delivers targeted improvements which support strategic passenger and freight movements through de-conflicting local and longer-distance traffic, and supports safety and air quality objectives. Many interventions support (and are supported by) public transport improvements.

This package includes interventions that support better access to the Solent Ports, a significant contributor to economic growth in the region. These include Smart Motorway enhancements along the M3 and targeted junction enhancements and climber lanes for HGVs and other slower vehicles, where appropriate, on the A34.

This package also includes interventions which support the sustainable regeneration of areas and local placemaking, such as A3 Guildford, the A320 North Corridor and a new Thames River Crossing to the east of Reading. These schemes are designed to unlock opportunities to reallocate road-space to active travel and public transport.

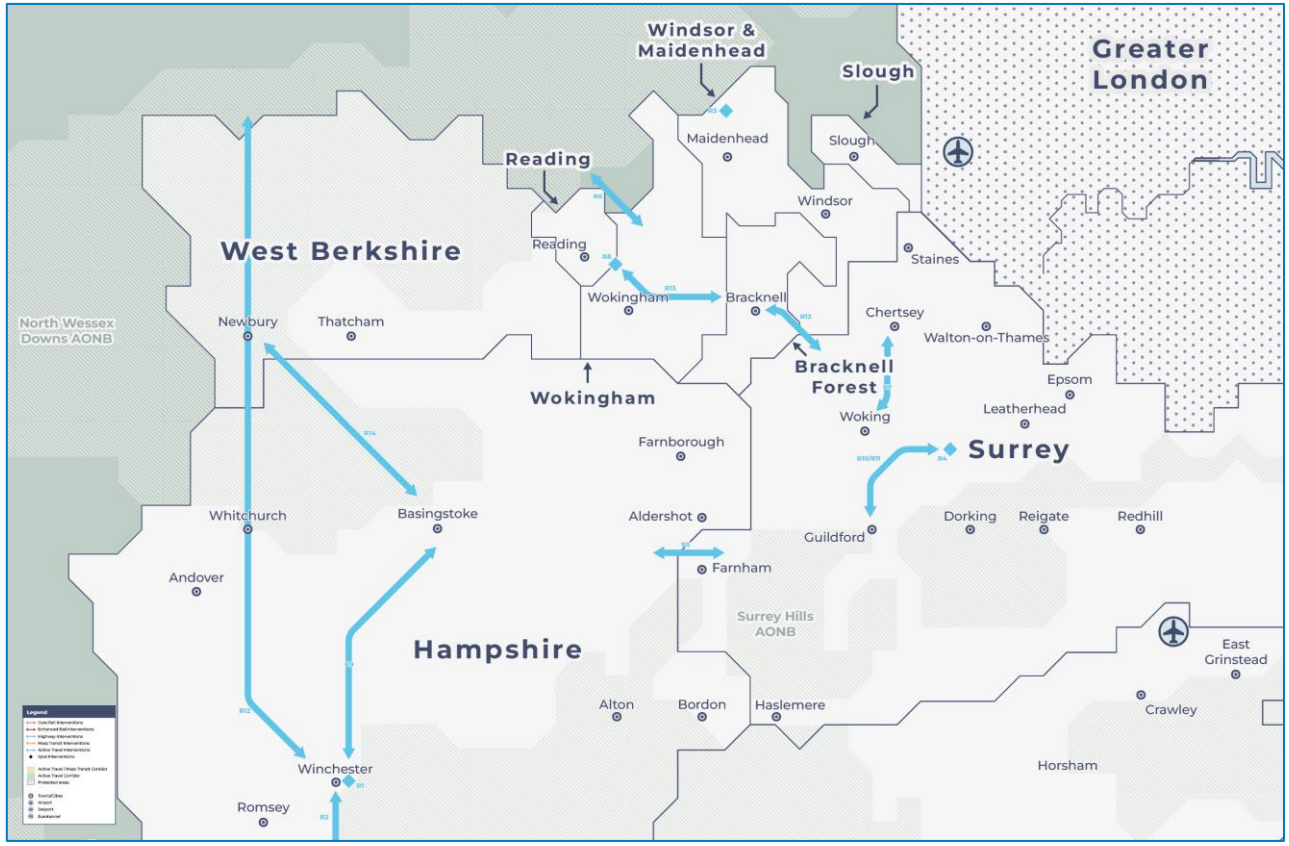
Benefits

- A more **reliable** and **resilient** highway network
- **Safer highways**, notably in urban areas
- **Improved air quality** in urban areas
- **Scope to reallocate road space** to active travel and public transport

Modelling Results

£90m GVA uplift per annum (by 2050, 2018 prices)

5,000 More car return journeys per weekday



Packages X & Y: Kent, Medway, and East Sussex Highways Packages

Overview

The Kent, Medway and East Sussex highways package delivers the Kent Bifurcation strategy – which strengthens the resilience of Channel Port access corridors – and improved connectivity for coastal areas.

This package includes several interventions that aim to improve the resilience of the M2/A2 and M20/A20 corridors, improve the connectivity of Coastal East Sussex (via the A21 corridor), and relieve congestion in city and town centres.

Many of these interventions will enable housing growth and/or improve public transport and active travel facilities in urban areas. In this sense, highways should be viewed as multi-modal interventions.

Any highway intervention on this corridor should be designed to de-conflict local and longer-distance traffic, safety and air quality. They should support (and be supported by) public transport improvements.

When modelled in isolation, these interventions are projected to increase carbon emissions. This effect will diminish if this package is combined with Global Policy and other mode interventions.

Benefits

- **More resilient** corridors serving the key Channel Ports
- **Safer highways**, notably in urban areas
- **Faster**, more **reliable highway journeys** between Brighton and South Hampshire
- **Improved air quality** in urban areas
- Scope to **reallocate road space to active travel and public transport**

Modelling Results

£90m GVA uplift per annum (KMES Highways)

£105m GVA uplift per annum (Lower Thames Crossing)

10,000 More weekday car trips (KMES Highways)

90,000* More weekday car trips (Lower Thames Crossing)

* Modelled flows of traffic associated with LTC will be established by National Highways and set out in the expected Development Consent Order.

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Global Packages of Intervention

Overview

The Area Studies Programme has also identified a **Global Package of Interventions** for the South East's highways. This is seen as impacting via Multiple locations across the region through the application of Global Policies that have considered

The Global Policy Interventions have been assessed separately to the Area Specific interventions by using a consistent framework for the whole of the South East to

reduce a long list of typologies to the short list of proposed interventions.

- Decarbonisation through accelerated roll out and use of zero emission vehicles.
- Demand management including road user charging.
- Lower public transport fares.
- Active travel and micromobility infrastructure and services.
- Greater digital connectivity and use.
- Better integration within and between modes, and with spatial planning.

Demand Management

Demand management can take many forms as an area of intervention – it covers:

- parking restraint (including car free urban centres, car free development);
- parking pricing (including workplace parking levies);
- congestion charging and emissions-based charging; and
- tolling of assets, including new infrastructure such as bridges and tunnels.

These interventions incentivise reduced levels of travel; retiming and rerouting of journeys; and mode shift to more sustainable modes.

Given how contentious such interventions can be, it is imperative that alternatives are available; and negative impacts, particularly on economy and equity, are mitigated.

Many demand management interventions have a pricing mechanism within them. Revenues can be hypothecated into the investment in sustainable alternatives and other mitigations.

Road User Charging

TfSE would be supportive of a national road user charging scheme introduced by the UK government that was underpinned by the following principles:

- It should be used as a demand management tool and not just for revenue raising;
- Ultimately it would be beneficial if the system is dynamic to respond to congestion and air quality issues, not just carbon emissions;
- Local demand management interventions that use pricing/charging mechanisms and/or road space reallocation and parking restraint are also supported where suitable – this is for local communities and their leaders to determine;
- It is beneficial if revenues raised are (largely) hypothecated for transport investment; and
- It is necessary to provide alternatives, particularly to the private car.

Exemptions for Road User Charging will also always need to be considered and kept under review.

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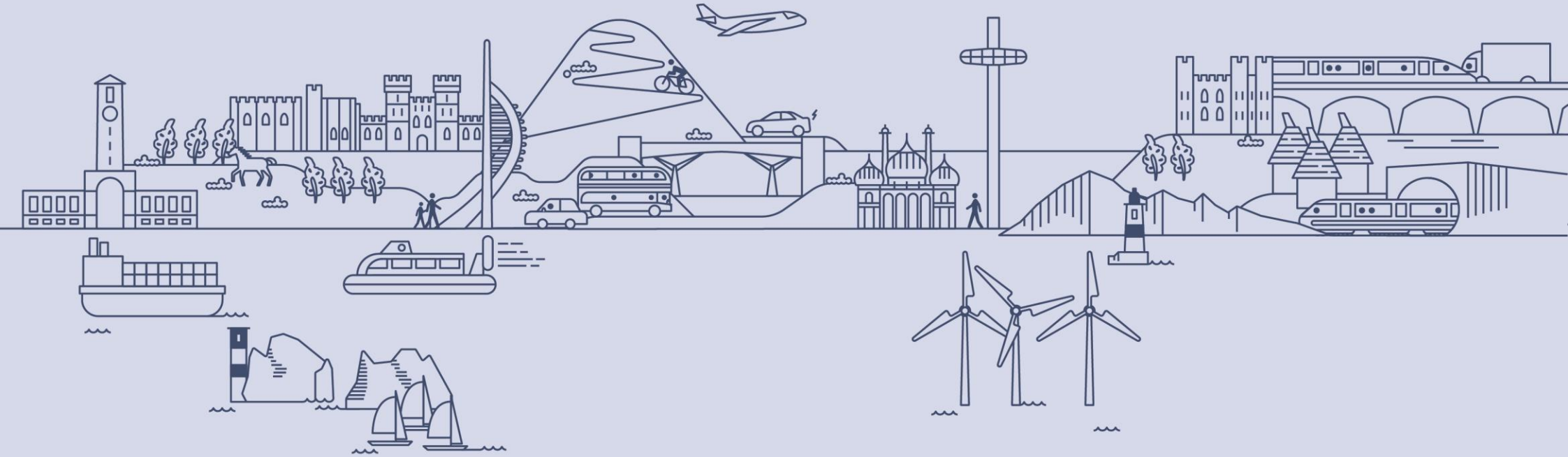


Part 6: Benefits and Costs

Assessing Benefits and Cost

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 in CO_2 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 highway network (notably capacity).

Capacity was estimated using Design Manual for Roads and Bridges capacity assumptions for different road typologies. In cases where an intervention only targets a portion of a link in the model, the percentage increase in capacity was weighted to reflect the portion of the link affected.

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 five highways Packages of Interventions is presented in **Table 6.1**.

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 1.

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 and STATS upgrades/relocation have also been added to the construction cost estimate. To reflect the maturity of the design a risk allowance has been applied.

Maintenance and renewal cost estimates are annual.

Modelling different approaches to Strategic Highways

We have modelled eight scenarios that reflect different approaches to the development of the A27 and A259.

One of the modelled scenarios assumed the A27 would be upgraded to a motorway standard, entirely grade separated between Eastbourne and Havant.

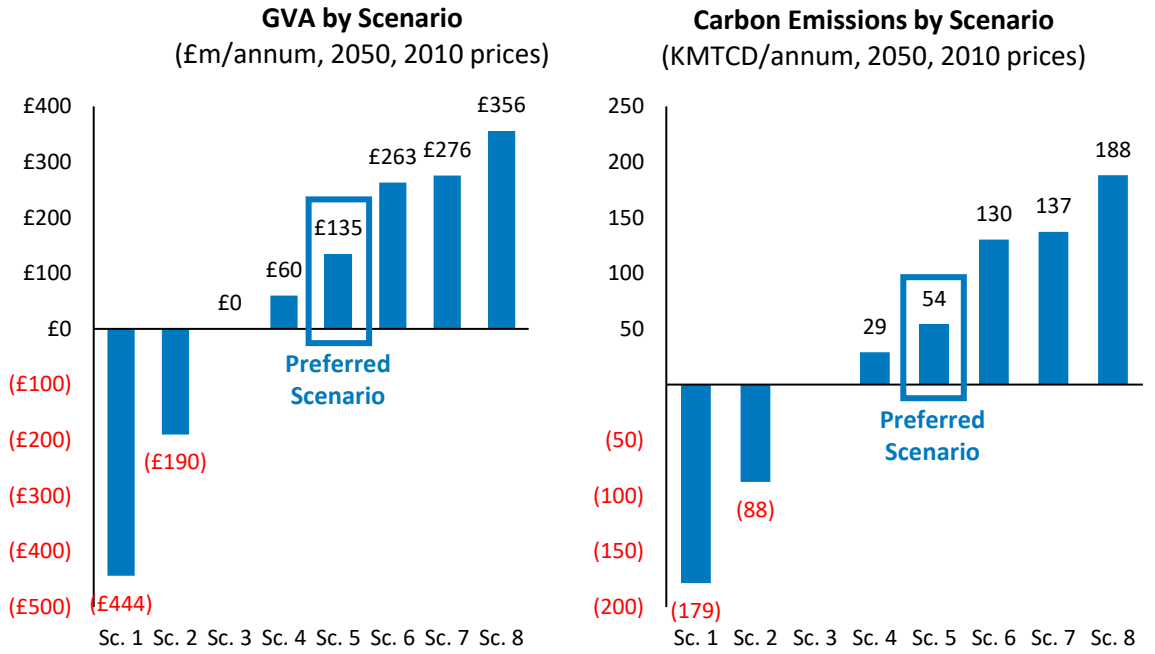
Other scenarios envisaged scaled back versions of a fully grade separated expressway. For example, there may be areas where flat junctions and/or single carriageway running are 'good enough' to deliver the desired level of connectivity.

We also considered scenarios that downgraded and de-trunked the A27 between Chichester and Shoreham. This included reducing highway capacity to deter traffic from using this corridor. While these scenarios delivered carbon reductions, they did so at the expense of GVA (and employment), and they delivered outcomes that ran against the Objectives and Problem Statements set out in this study.

Figure 6.1 presents the spectrum of results generated by modelling these scenarios in SEELUM. It shows forecast carbon emission and GVA outcomes in the year 2050 – the final year of the model run.

The preferred option that was selected for the South Coast Highway Packages is Scenario 5 (Sc. 5). This assumes modest improvements to the Strategic Road Network that focus on segregating strategic and regional traffic rather than materially lifting capacity along the whole corridor.

Figure 6.1: Range of Highways Scenario Modelling Results



The South Coast Highway Package delivers a strong increase in GVA for a modest increase in carbon – it also delivers the highest GVA growth per unit of carbon. The carbon generated by this package is more than offset by rail, bus and mass transit, active travel, and other interventions supported by this study (see other Thematic Plans).

TfSE and its partners have not endorsed the most interventionist package modelled above. However, they have endorsed a package of interventions that meet the Area Studies' objectives – including those that deliver improvements to safety, air quality, access, and regeneration – and address the issues relating to poor east-west connectivity.

Benefits and Costs

Table 6.1: Benefits and Costs

Package	Population	New jobs	GVA (£m)	Total CO_2	Car Trips	Rail Trips	Bus Trips	Capital Construction Cost (£m)	Annual Maintenance and Renewals Capital Cost (£m)
South Coast Highways	250	700	170	45,000	5,000	-	5,000	3,800	205
London to Sussex Coast Highways	700	1,350	140	20,000	5,000	-	-	1,600	110
Wessex Thames Highways	200	450	90	25,000	5,000	-	-	2,300	95
Kent, Medway and East Sussex Highways	1,200	950	90	45,000	10,000	-	-	4,200	225
Lower Thames Crossing	1,600	1,400	260	45,000	85,000	-5,000	-5,000	2,400	180

Summary of Benefits

All highway packages support growth in housing, employment and economic productivity (GVA) through reduced journey times and supporting development.

Despite Packages being refined to minimise increases in carbon emissions, all highways specific packages do result in small increases.

Further mitigation will be needed as these packages and interventions are developed. They will also be complemented by a number of Global Policy Interventions, which will, promote demand management and digital technology to reduce the number of trips, accelerate the decarbonisation of road vehicles, and promote sustainable travel.

Notes

- GVA (Gross Value Added) is GVA per annum in 2050 in 2010 prices
- Carbon emissions are CO_2 tonnes equivalent in 2050
- Costs are in 2020 prices
- Changes in trips are weekday return trips
- Lower Thames Crossing cost and carbon has been weighted to the portion of the scheme in the TfSE area (approx. 40% lies in the Transport for the South East area)

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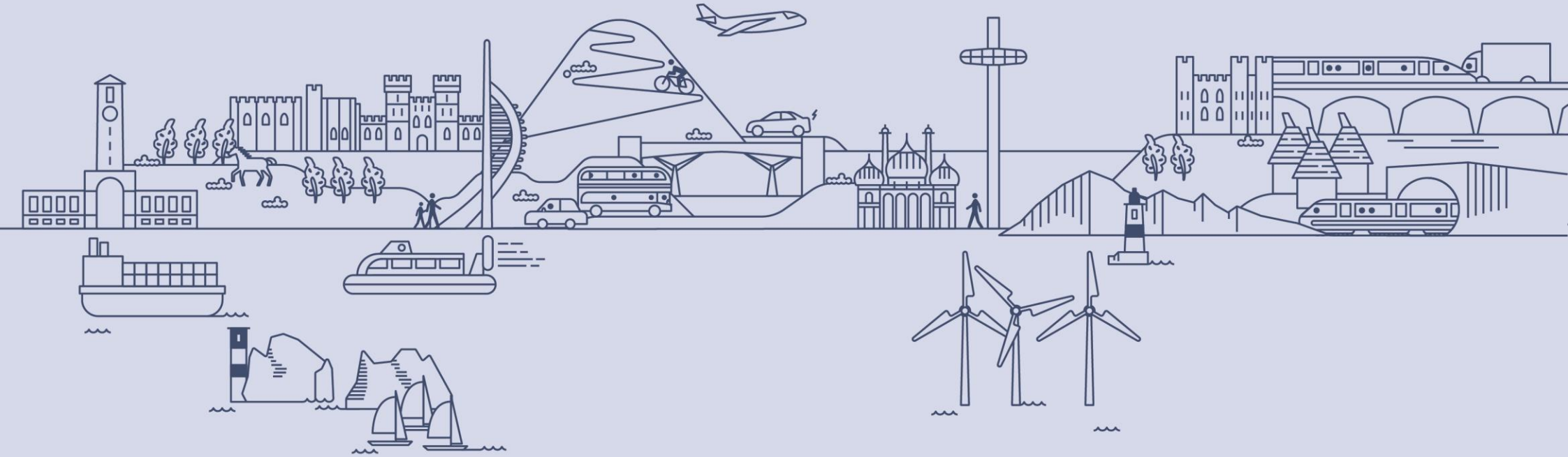

Part 7: Delivery

Delivery Context

Introduction

TfSE will work with partners – notably National Highways and Local Transport Authorities – to deliver the global interventions and highways infrastructure outlined in the previous sections of this plan.

The delivery of the packages of highways interventions will need consider:

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

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

More detailed considerations of delivery are provided in each Strategic Programme Outline Case and the overarching Delivery Plan.

Roles and Responsibilities

As the custodian of the English Strategic Road Network, National Highways (NH) leads the development, delivery and maintenance of interventions on this network.

NH will also support interventions where the Strategic Road Network interfaces with Local Transport Authority highways. It will utilise its internal Project Control Framework to develop the business case for highways interventions. Funding will be allocated through the Road Investment Strategy (RIS) and delivered through the Road Investment Programme (RIP). At the time of writing, a small number of highways interventions are expected to be delivered in RIS2 (2020-25), and some are being considered for RIS3 (2025-30). Some interventions are expected to be delivered beyond 2030 (e.g., Lower Thames Crossing).

Local Transport Authorities will also have a very significant role to play in delivering interventions on major and other highways. They are the custodians of their own highway networks and can fulfil the role of sponsors for major interventions on highways in their areas.

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 highways maintenance and development.

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 7.1** on the following page.

Roles and Responsibilities

Table 7.1: Roles and Responsibilities

Intervention	Lead Authority	TfSE Role
Global policy interventions – national road user charging	• Central Government (e.g. Department for Transport)	• Further strategy development • Stakeholder engagement • Pre-feasibility work • Advocacy
For Strategic Road Network infrastructure	**Schemes under development**	
	• National Highways	• 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	
	• National Highways • Local Transport Authorities	• Programme management, including stakeholder engagement with Central Govenrment 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
For other highways infrastructure	**Schemes under development**	
	• Local Transport Authorities	• Programme management, including stakeholder engagement with Central Govenrment 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, institutional capacity, and balancing desired outcomes.

Most of the interventions planned for the Strategic Road Network will fall into Road Investment Strategy 3 or later funding and delivery cycles. Interventions delivered through Local Transport Authorities will be subject to each authority's planning and funding cycle, which may be contingent on the adoption and refresh of Local Transport Plans and Local Plans. General timescales for delivering highway intervneitons is shown in **Table 7.2**.

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

- the business base for many highways interventions in the Kent, Medway, and East Sussex highways package will rely on the timing and delivery of the Lower Thames Crossing; and
- the impacts of each Package of Intervention on carbon emissions are highly dependent on the trajectory of the decarbonisation of the transport system, which is tied to the Global Policy Interventions.

Figure 7.2: High level schedule for the delivering highway interventions

Category	Sub-Category	Timeframe	Implementation
Highways	Junction Improvement	3-5 years	1 year
Highways	Widening	3-5 years	1 year
Highways	New Online Infrastructure Improvement	3-5 years	1 year
Highways	Bridge/Tunnel	15-20 years	5 years
Highways	Bypass/Relief Road	10-15 years	4 years
Highways	Lorry Park	5-7 years	2 years
Highways	Service Improvement (e.g. CAZ)	3-5 years	1 year

There are also important interfaces within each Package of Intervention. For example:

- a whole solution for the A27 relies on and end-to-end approach to this highway, rather than focussing only on "easy" schemes while putting off harder decisions; and
- there are strong interactions between interventions targeting the Channel Port corridors (M2 and M20), which could extend to post delivery operations and management.

Other Delivery Considerations

Funding and Financing

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

This topic is are 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 it some of the best ways of securing investment in major interventions is 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 highway infrastructure can be sourced from:

- Central government funding (e.g., Road Investment Strategy).
- 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.
- Road user charging and tolling

With regard to charging, it is recognised that this should be used as a demand management tool and not just for revenue raising. It would also be beneficial if systems were dynamic to respond to congestion and air quality issues, not just carbon emissions. It's recognised that local pricing/charging mechanisms are for local communities and their leaders to determine and structure in relation to local needs.

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, National Highways, 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). 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 7.3** on the following page.

Theory of Change Monitoring and Evaluation Framework

Table 7.3: Key Performance Indicators

Inputs	Outputs	Outcomes	Impacts
• **Funding** invested in highways packages • **Delivery** of interventions	• **Connectivity**: Faster average journey times (e.g. between Eastbourne and Chichester) • **Capacity**: Appropriate capacity is provided for normal demand	• **Reliability:** Journey Time Reliability • **Resilience:** Improved ability to respond to uncertainty and shocks in the transport system • **Safety**: Reduced collisions and injuries (KSI) • **Air quality**: Reduced particulate, SOx and NOx emissions. • **Reduced conflicts**: Fewer flat junctions, right hand turns, and roundabouts • **Ease of delivering other interventions:** other transport interventions are easier to deliver – especially those requiring road space reallocation such as bus and active travel.	• **Improved place**: Highways in built up areas are better suited to the needs of residents and highway users, especially vulnerable users • **Agglomeration**: More efficient allocation and sharing of resources within and across the region • **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

For further information please contact

TRANSPORT FOR THE South East

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

Steven Bishop
Programme Director
Steven.Bishop@steergroup.com

Andy Cleaver
Technical Advisor
Andy.Cleaver@atkinsglobal.com