TRANSPORT FOR THE South East

Future mobility strategy

Transport for the South East

Date: July 2021

TABLE OF CONTENTS

FIGURES

TABLES

Definitions

Active travel – this refers to modes of travel that require physical activity by the user such as walking, cycling and self-powered mobility devices (e.g. kick scooters).

AV – Autonomous Vehicle or sometimes referred to as Connected Autonomous Vehicle or CAV. However, to operate, it is highly likely that AVs will need to be digitally connected, either continuously or periodically, therefore, 'connected' will be integral to AVs.

Business as usual – the normal, day-to-day or standard way of operating.

Bike-share – a bicycle sharing system where pedal or electric bikes are provided for use by the public via subscription or one-off payment. Systems can be docked or dockless.

Car club – a service model where users join a 'club', either on a one-off or subscription basis, that enables them to rent a car or van for short periods of time; usually minutes or hours. Vehicles are often parked on street and can have spaces designated to them.

Consumer-focused freight models – Freight and logistics services using increasing amounts of data and automated technologies to provide customers with a wider selection of flexible first and last miles delivery and collection options.

Digital-as-a-mode – service models that enable people to undertake activities using the digital devices including working, education, healthcare, retail, leisure and social interaction. Such models include video-conferencing, local authority online services, online medical appointments and online retail.

Digital or dynamic demand responsive transport (DDRT) – A mode that mixes the flexibility of taxis with larger capacity shared vehicles, typically mini-buses. Passengers use digital devices to book an end-to-end journey via a shared passenger transport vehicle that operates on a non-fixed route or timetable which dynamically flexes to the journeys booked by passengers.

E-cargo bike – a cycle using electrified assistance to pedalling (with two, three or four wheels) with freight carrying capacity used for local logistics

E-scooter – an electrified 'kick' scooter on which a rider stands on a platform between front and rear wheels and holding onto handle bars.

Electrified mobility – this refers to the electrification of mobility including battery electric and hydrogen fuel cell electric propulsion.

EV – electric vehicle, with either battery electric or hydrogen fuel cell electric propulsion.

Freight consolidation – a logistics strategy where multiple shipments are combined into one load and transported to a distribution point where the load is broken up into smaller shipments for delivery to final destinations. Consolidation can occur at different scales from regional logistics hubs served by rail and HGVs down to local 'micro-consolidation' centres in neighbourhoods served by light electric vans and e-cargo bikes.

First mile/last mile – the first or last sections of journeys usually between the journey origin and a mass transit stop/station (the first miles) and from a stop/station and the destination (the last miles). This term neglects the fact that these sections of journeys are often longer than a mile and in rural areas particularly such journeys can be many miles.

Gamification – the use of game elements in reward schemes for incentivising people to make certain travel choices. Typically, people participate as 'players' and can earn points for undertaking a particular behaviour, which they can use as rewards for cash or vouchers.

Low level air – applies to low level uncontrolled airspace, between the earth's surface and the part of the sky for which air traffic control is applied. Mobility in this space could be provided by Unmanned Aerial Vehicles (UAVs or drones).

Mass transit – major public transport systems for the moving of large numbers of people; typically bus, bus rapid transit, light right and heavy rail.

Micromobility – transport using small lightweight, often electric, vehicles; typically e-scooters, bikes and e-bikes.

Middle mile – the main, longer sections of journeys; typically mass transit or car journeys which are often supported by shorter 'first mile/last mile' sections at either end.

Mobility – the movement of people, goods or data via digital or any physical means.

Mobility as a service (MaaS) – the integration of multiple mobility modes and services into a single digital planning, booking and payment channel.

Mobility asset sharing/shared mobility – services that enable people to access shared modes, through apps and websites, when they need them including car clubs, bikes, e-bikes and e-scooters.

Mobility eco-system – the complex interlinked networks of vehicles, infrastructure, service models, energy, digital communications, management, policy, funding and people that form mobility.

Mobility hub – a modern transport interchange bringing together traditional and new modes and services with supporting infrastructure and traveller facilities. Often used to increase zero emission, active and shared mode choices and support first mile/last mile connectivity to mass transit. Increasingly, hubs are considering the provision of wider community and commercial activities to make hubs a focus for local activity.

Operator-focused freight models – freight and logistics service models to support operators of logistics (i.e. accessed online, in-vehicle or through mobile devices) offer them easier access to real-time and price transparent services. In turn, data-driven models improve supply chain visibility and asset utilisation for operators through the likes of integrated fleet management systems.

Publicly available transport – broad definition of transport that is available for use by the general public encompassing traditional public transport (see definition below) and modern shared modes such as ride-sharing, ride- hailing, car clubs, bike hire, e-scooter hire, etc.

Public transport – traditional definition applied to publicly-provided transport, most notably bus, tram and train and sometimes taxi.

Ride-sharing – schemes that match private vehicle drivers with potential passengers (often co-workers) making similar regular or one-off trips.

Ride-hailing /ride-sourcing – schemes that match customers with available rides using a smartphone app. Users can register their desired trips and pay on account via pre-approved payment methods with prices set according to supply and demand. These journeys can be 'sole use' for single journeys or 'shared' by people making different journeys (e.g. DDRT)

Sandbox – A term taken from information technology testing, sandboxes are sites or areas, either physical or digital, that provide piloting and trialing with defined environments where testing can be undertaken in a safe and controlled manner, but which replicate, or are, real world situations.

Transport – in the context of this strategy, transport is defined as physical travel, personal or freight/logistics, via vehicular modes. This excludes walking or digital-as-a-mode activities but includes, for example, bikes, scooters, private car, taxi, bus, tram, train, aircraft and maritime (ferry or cargo ship). Transport modes can be privately 'owned' or publicly available.

Foreword

I'm delighted and proud to present our future mobility strategy, which sets out how new and emerging transport technologies can help us achieve our vision of a better connected, more inclusive, more productive and more sustainable South East.

At its most fundamental level, future mobility is about how we will travel and move around in the future and the opportunities that new and emerging transport technology might bring. That's everything from e-scooters, bike hire, shared-ownership car clubs and smart ticketing to 'mobility as a service' solutions offering fully integrated, door-to-door journeys, paid and planned for in one go.

This rapidly developing area could change all aspects of how we live, work and travel in the South East. It has the potential to make life easier for people and businesses, improving connectivity and accessibility, reducing congestion and drastically cutting carbon emissions.

Working with our partners here in the South East and nationally, this strategy sets out a people- and place-based approach to future mobility to ensure that the benefits of innovation and investment are maximised in each part of our region. And our action plan sets out the steps to get us there, so we can track our progress and deliver tangible results.

It builds on the challenges and opportunities identified in our thirty-year transport strategy, published in 2020, providing a framework for local authorities and other key partners to help them understand where, when and how to invest in new transport technology, systems and services.

Because invest we must. We can't keep doing as we have done in the past. We can't keep prioritising schemes which fail to meet the significant challenges that lay ahead. We can't rely on market forces alone to drive the changes needed to reach net zero carbon emissions. And we can't allow people and businesses in our towns and cities to benefit from transport innovation while those in rural areas are left behind.

Properly managed, the transport technologies of the future will make journeys faster, safer, greener, easier, more comfortable and more affordable. They will make our towns and cities quieter and less polluted. And they will enable us to provide mobility as a service, integrated and accessible to all.

That's what this future mobility strategy and action plan is designed to deliver. And while it's clear that Transport for the South East can't control all the levers driving the development of transport technology, we can and must help steer the direction and uptake of these innovations in our region and the regulatory frameworks that govern them.

We're clear that we can't do this alone, which is why this strategy sets out the range of partners with a stake in future mobility in our region and the roles and responsibilities we collectively share. Transport for the South East will provide the leadership that's needed and we're confident we can count on the support and commitment of partners across the public and private sectors, locally and nationally, to deliver our vision for the future.

Finally, I would like to thank all those who have contributed to the development of this strategy, and in particular the members of our future mobility working group who gave their time and energy during a truly challenging period.

Rupert Clubb

Lead officer, Transport for the South East

Executive summary

Steering our way to a different future

Transport is in the midst of a revolution.

The transport sector's response to the decarbonisation challenge is gathering real momentum. The digitisation of transport is bringing new types of transport services to market, from e-scooters to delivery drones. The interdependency between mobility, digital networks and energy needs is becoming ever more critical.

Transport for the South East's challenge is to harness the forces driving this transport revolution for the benefit of our region, its people and its economy.

That means breaking the historic link between economic growth and carbon emissions – the result of decades of policy and behaviour that prioritises the private car over more sustainable modes. It means recognising that, on its own, the conversion of the vehicle fleet to clean fuels will not deliver the reductions in carbon emissions that are needed.

Future mobility can help us break that link. It can provide us with the opportunity to do things differently, building on the promise of easier, safer, cheaper and cleaner travel enabled by new technology – delivered in a way that focuses on the specific needs of people and businesses in the South East.

Ours is a vibrant and hugely successful region. It acts as a powerful motor for national prosperity, adding more to the UK economy than any region outside London. Our ports, airports and cross-Channel rail links connect Britain to Europe and the rest of the world. Our roads and railways help tie the country together. Our people and businesses drive innovation across a range of high-growth industries.

This dynamism and diversity is the South East's greatest asset, so it is right that we have developed a future mobility strategy that reflects and builds on that strength. It provides a framework to guide decisions about investment and help shape the conversation about transport taking place locally, regionally and nationally.

At its heart, this strategy is about the different needs and priorities of people and places in the South East and how new approaches to mobility can deliver our partnership's vision of a better connected, more inclusive, more prosperous and more sustainable future for all.

Defining the future of mobility

Future mobility considers new and emerging systems, services and modes, whether they be early signals on the horizon of a potential new system, growing trends of a new service or an established trajectory of a new mode. The revolution in transport has already brought significant changes in the form of electric cars, e-scooters and e-bikes, delivery robots and drones, mobility hubs and ride-hailing. While offering different solutions and appealing to different markets or customers, these new additions to the mobility landscape have all been developed with the user firmly at the heart of the system.

Future mobility, by definition, must be live to what is changing now and the emerging challenges and solutions. Key signals, trends and trajectories that affect mobility need to be monitored, not simply new technology but also the global, national and local changes that affect economies and communities and which may influence mobility over the coming years.

Our future mobility vision

Taking a lead from the 2050 vision set out in Transport for the South East's transport strategy, a specific vision has been developed with stakeholders to steer the development and delivery of the future mobility strategy.

Future mobility 2035 vision

"By 2035, the South East of England will have a globally leading sustainable mobility eco-system accelerating the move to net zero. The region will be at the forefront of innovation, integrating new technologies, modes and services with digital communications and energy networks. People and all the places they live, work, learn and play, will steer our actions, ensuring the future of mobility is inclusive of and responsive to their needs and provides opportunities and choices for all".

This vision is supported by a number of more detailed objectives which the strategy and its interventions aim to achieve over the period to 2035:

Future mobility strategy objectives

- Future mobility will play a central role in helping decarbonise the transport eco-system through the provision of electro-mobility modes and services to help reduce dependency upon the sole occupancy, private car irrespective of propulsion type.
- Active travel will be the first choice for local journeys, for those who are able, supporting better air quality and the improved wellbeing of communities.
- Zero emission mass transit will be at the centre of the mobility ecosystem, reducing car dependency and ownership.

- The connectivity, capacity, efficiency, reliability and resilience of the mobility ecosystem will be optimised, making best use of existing assets and investments in services and infrastructure.
- Future mobility will be integrated with the established passenger and freight/logistics transportation networks, delivering safe, seamless journeys and making planning, using and paying for mobility simpler and easier.
- Future mobility will be integrated with spatial and economic planning, making high quality people-focused places, securing funding, supporting investment in the region's economy and targeting investment where it is needed most.
- The mobility eco-system will be people-centric and accessible to all, supporting the lives of everyone through integrating the needs of communities and urban and rural places, with policy, modes, services and infrastructure.
- Fit for purpose digital connectivity will be universal, improving access to services and reducing the need to travel.

People- and place-based mobility

Our strategy has been developed around the needs of the South East's diverse population and mix of communities and their potential to use new modes, services and infrastructure.

To do this, we have looked beyond our collective needs in terms of access to employment, education, healthcare, etc. to understand how needs vary from person to person and from place to place - and, crucially, how these varying needs will affect peoples' propensity to use different mobility modes, services and infrastructure.

Today, there are people who find themselves isolated economically, socially, geographically or technologically, meaning they can't readily access their needs and play their full part in their communities and the economy. By understanding and planning for the different characteristics that make up our individual identities, we can put in place new mobility solutions which reduce or even remove that isolation and allow people to live better lives.

Transport for the South East has also considered how communities vary across the area and the demographic changes we are likely to see over the coming decades. Some of the major environmental, economic and social trends have been investigated and how these may affect communities in the area has been identified. In analysing the different future mobility service models, an assessment has been made of how these meet the needs of different groups of people within the South East.

To further support our work, we have identified four broad types of place in the South East; major economic hubs, urban areas, rural settlements and locations that constitute our remote rural areas. These have been further sub-divided to reflect their geographic position in the region including their scale, relationship to London and relationship to the coast.

This analysis of the South East in terms of its people and places has enabled us to develop specific 'bundles' of future mobility modes, services and infrastructure which are best suited to each type of location in our region across the region; see Figure i overleaf.

Shaping the future of mobility

These future mobility 'bundles' provide guidance to local authorities and partners in those areas based on what we know will work best. But the strategy is not prescriptive and provides flexibility for specific packages of interventions to be developed for an area taking account of local conditions. These interventions have been prioritised across the four place types, setting out the higher and lower priority interventions for those areas. The strategy has been brought to life through the presentation of four 'personas' identifying how the bundles could change the way people with different lives make their transport choices.

To support the delivery of the bundles of interventions – and future mobility more broadly – our strategy identifies a range of complementary interventions focusing on key themes:

Engaging and influencing

Interventions include setting up a future mobility shared learning hub to provide online information, learning and best practice and setting up stakeholder forums to bring together partners with an interest in future mobility and specifically rural future mobility.

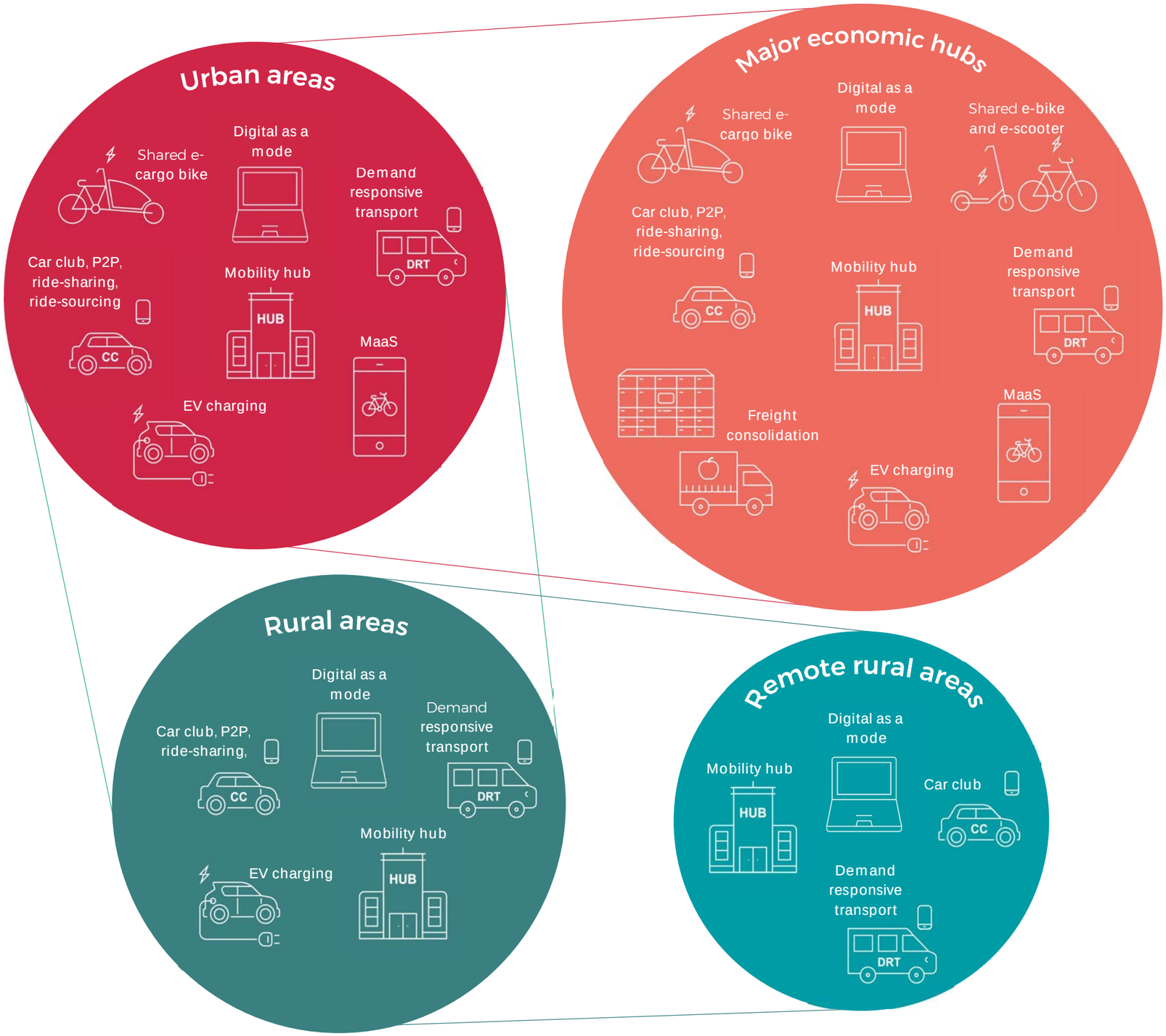
Policy

Policy interventions include more detailed strategies on mobility hubs, the future of mobility propulsion and first mile/last mile journeys. In addition, within this area are proposals for integration of future mobility into wider economic, spatial and transport policy, behavioural change policies and public sector service digitisation.

Facilitating infrastructure

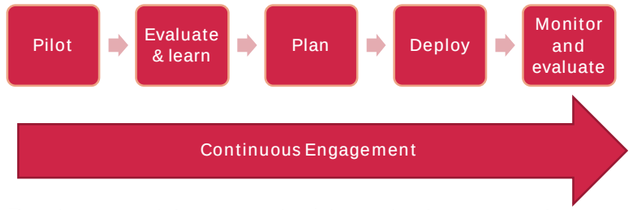
To support the delivery of future mobility, the strategy also aims to work with stakeholders to deliver local electricity grid upgrades and electrification for larger vehicles as well as further development of urban and rural digital communication networks.

Figure i – Place-based Bundles



Delivering the future of mobility

The strategy sets out a five-stage process for delivering future mobility in the South East.



Piloting is at the heart of the strategy and there are proposals to support trials of future mobility modes, service models and infrastructure across the area including:

- Formulation of a regional piloting co-ordination group
- Best practice guidance for piloting and evaluation of future mobility
- Engagement with private sector partners to develop relationships and facilitate piloting

Identification of locations across the South East where pilots and trials can be undertaken in both highly controlled environments and in the public domain

The key aim of piloting is to evaluate and learn about future mobility interventions so that full-scale deployment is informed and optimised. It will also, in some cases, help us understand which proposals are unlikely to be deliverable, impactful or sustainable in certain locations or under certain conditions. The strategy therefore also proposes the development of a piloting, monitoring and evaluation framework to steer and streamline the learning process from piloting across the area.

The integration of future mobility into local policies and programmes will support the planning and deployment of future mobility in each area and this should be supported by ongoing and structured engagement across the South East with partners and stakeholders through topic-focused forums.

Delivery roles

The interventions and actions identified in this strategy cannot be delivered by Transport for the South East alone.

We will need the support and engagement of partners from across the public sector and different tiers of government, from mobility service and infrastructure providers, vehicle manufacturers, research organisations and professional institutions, utility companies, landowners as well as special interest and user groups.

The roles and responsibilities of these partners will vary across interventions and their types (engagement, policy, service and infrastructure). Broadly, the roles and responsibilities include intervention development, funding, commissioning, delivery, operation, monitoring and evaluation, and review.

The Future Mobility Strategy is supported by a Strategic Plan which provides more detail on the roles and responsibilities of different actors in future mobility and also sets out a monitoring and evaluation framework for the strategy.

A call to action

Transport for the South East's role in steering the future of mobility will focus on setting the policy framework for the South East, engaging with and guiding stakeholders at all levels of government and across industrial sectors, monitoring the emergence of future mobility, and working with partners to deliver change and make the case for investment.

This strategy sets out a comprehensive suite of interventions to plot a path through the uncertain world of future mobility to deliver engagement, policy, new services and infrastructure.

The range of stakeholders and partners involved in future mobility have been identified and the strategy identifies how they can work together to deliver the new modes, service models and infrastructure future mobility promises. A monitoring and evaluation framework has been developed to ensure that the delivery of this strategy is checked and challenged, its impact is assessed and lessons are learned and disseminated.

Finally, it is worth reiterating that Transport for the South East cannot deliver the future of mobility in our region on its own. Change requires the buy-in, support and resources of all those organisations with a stake in mobility; those who fund it, plan it, deliver it and use it.

Introduction

1. Introduction

Transport for the South East is the sub-national transport body for the South East of England[1]. As a partnership, Transport for the South East brings together 16 local transport authorities, five local enterprise partnerships, 46 district and borough authorities and a range of wider stakeholders from the worlds of transport, business and the environment.

The South East is one of seven areas covered by different sub-national transport bodies, with the Transport for the South East area bounded by England's Economic Heartland, Western Gateway and Transport for London.

Transport for the South East's mission is to create a globally leading integrated and sustainable transport system that makes the South East more productive and competitive, improves the quality of life for all our residents and protects and enhances our unique natural and built environment.

Transport for the South East has an ambition to become a statutory body with the powers and funding to drive our transport strategy forward and help the South East reach its full potential. By speaking with one voice across the area, Transport for the South East is focused on our region's transport priorities, to make a strong case to government for the valuable investment the South East needs.

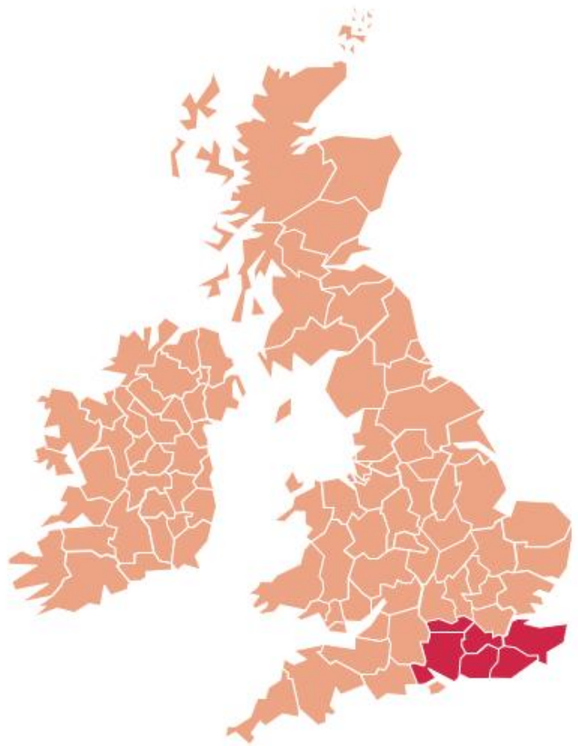
Continuous change in mobility

Mobility can be seen as a vast eco-system helping the environment, economy, and communities of the South East thrive. The system is made up of a complex set of interacting elements that together provide people and organisations with access and connectivity to support their daily activities. The mobility eco-system is made up of vehicles, infrastructure, service models, energy, digital communications, management, policy, funding and, most importantly, people; the customers, operators, drivers, engineers, planners and the wider communities who benefit from mobility.

However, the eco-system is not perfect, and these same people can be harmed by mobility or, at very least, not provided with the access and connectivity they need. From air pollution and the impacts of climate change, and the cost of travel reducing affordability, to safety and personal security issues and the varying levels of connectivity in urban and rural areas, mobility does not support everyone equally and the resulting harm affects some more than others.

Mobility is not a static eco-system and is constantly changing alongside the environment, economy and communities it supports. There are major trends driving changes in mobility and they must be planned for and harnessed to ensure the mobility eco-system of tomorrow is able to meet the emerging challenges it faces. New methods of propulsion, business models, modes, digital connectivity, attitudes and automation, as well as how these all interact, are leading that change across the whole of mobility. These trends and changes are not replacing the existing eco-system, they are evolving, enhancing and optimising mobility. However, while future mobility promises positive change, there are also threats and challenges where change is abrupt, unplanned and unprepared for.

The COVID-19 pandemic has brought significant challenges to the way people live and not least in when, why, where and how they travel. The pandemic is a live threat to the health of our communities and



economy but also presents opportunities for the medium and long term. Existing trends have been altered; some accelerated, such as home working and e-commerce, some slowed down or reversed, such as growth in rail travel, while new trends have emerged including the use of e-scooters being piloted in a number of towns and cities. New trends may continue and previous trends may resume but the long-term effect of the pandemic is unclear,

The responses to the pandemic have been a result of necessity, not strategy, therefore, what positive trends do emerge from the pandemic need to be supported, planned for and integrated into the wider mobility eco-system while negative impacts need to be

1 The local transport authorities represented by Transport for the South East are Medway, Kent, East Sussex, Brighton and Hove West Sussex, Surrey, Hampshire, Southampton, Portsmouth, Isle of Wight, Slough, Windsor and Maidenhead, Reading, Bracknell, Wokingham and West Berkshire. It should be noted that this definition of the South East excludes Oxfordshire and Berkshire which are included in the statistical region "South East".

mitigated. The need for resilience in the eco-system to sudden shocks, like the pandemic, must to be reflected and built into the physical designs and operational and commercial models.

The focal point for planning for the future of mobility must be comprehensive strategies that build on evidence and understanding of the challenges and trends to be faced. They must also set clear visions and goals and provide a suite of tools, across many aspects of mobility, to help realise the ambitions of the areas they support.

Future mobility should interact with wider plans and strategies that are steering the shape of transport, from new national policies for bus and rail to the development of local transport plans. This future mobility strategy is leading change by setting out proposals that can be embedded into emerging policy at different government levels, including the Transport for the South East area studies,

This future mobility strategy

This future mobility strategy focuses on harnessing new opportunities to transform the lives of people in the South East and improve each and every place in the area. In doing so, it is continuing the approach set out in Transport for the South East's transport strategy; instead of planning for vehicles, it puts people and places at the heart of the future of mobility. It considers all people and communities, from the earliest adopters to those who struggle with new technology and plans for rural areas as well as the urban and peri-urban. The strategy is about action, setting out proposals to deliver for the South East, work with stakeholders, secure funding, and set the direction for mobility in the area for the years to 2035 and beyond.

The strategy is the start of a process rather than an end as change is continuous and is often rapid. The strategy is live to that change and it will be updated regularly, supported by a constant conversation with partners and stakeholders, to reflect that continuous change in mobility technologies and services, and attitudes towards them.

The outcome of this strategy is not fixed. In its delivery, allowance needs to be made for unknown outcomes due to the lack of maturity of the technology and commercial models with some failing and some succeeding. The potential for new modes and services to be launched in towns and cities, sometimes almost without warning, means that strategies that once considered fixed trajectories of change now need to be live to all manner of possibilities.

Many aspects of future mobility are as yet untested at a wide scale; which means piloting and trialing must remain a key focus as well as monitoring, evaluation and learning, and disseminating lessons learned.

This strategy primarily looks forward to 2035 but with a view to 2050, and is also concerned with what is here now, emerging over the next 2-3 years and the longer term. It is a constituent element of the wider Transport for the South East transport strategy along with the area studies, and freight, logistics and gateways strategy. It considers the movement of people, freight and information both physically and by digital means.

This is a strategy not just for Transport for the South East to deliver. Success needs collaboration between public, private and third sectors. Working with partners and stakeholders, the strategy focuses on creating the conditions for success, for people and places to flourish and for the future to be embedded into every aspect of mobility in the South East. That success can only be achieved if the right conditions are enabled for innovation to flourish and become business as usual.

In developing this strategy, alongside the wider policy framework, Transport for the South East has considered not only what new modes, services and infrastructure may bring to the mobility eco-system but how mobility interacts with wider challenges and objectives. This strategy takes a people centric approach, ensuring that the diversity of communities and places are reflected in our thinking. It considers how wider environmental, economic and social trends influence or are influenced by mobility. Policy must not just focus on moving people but enabling them to make choices not to travel, to undertake activities by digital means, and how their needs and those of organisations are met by freight and logistics.

This strategy has been developed to help deliver net zero and support the South East build back from the COVID-19 pandemic and has been developed in consultation with a Steering Group comprising partners from the public, private and academic sectors[2] .

This strategy is supported by a separate strategic plan which provides an action plan and monitoring & evaluation framework for the strategy and a technical report which provides a summary of the analysis undertaken in the development of both of these documents.

Personas

In developing this strategy, through the analysis of the population of the South East and the areas in which they live, a number of 'personas' have been developed to help demonstrate the potential effects of future mobility on individuals. On the following page, four different personas are introduced and later in the strategy their pain points in travelling are identified. Finally, the potential impacts of the strategy interventions are explained in terms of what they could mean for the personas and their journeys

[2] The Future Mobility Steering Group has been the primary stakeholder consultation mechanism throughout the development of this strategy. It is formed of a wide range of public, private, academic and third sector organisations who have met regularly to oversee and comment on the outputs from the study to develop the strategy. The Steering Group will provide the basis upon which the South East Future Mobility Forum will be formed.

Miguel

Who are they?

Miguel is an international student who cares about the environment.

He lives in shared accommodation in a university city and although he works part time, he also gets some money from his parents. Miguel's leisure time is important to him.

What journeys do they make?

The main trip that Miguel takes is to university but he will often take leisure trips to gigs, sports events and meeting friends. He usually chooses to walk or cycle.

Miguel doesn't own a car so when the weather is bad or he wants to travel further he uses the bus or gets lifts from his flat mate.

Miguel's trips are usually short but his longest trip is when he flies back home to visit his family and he uses the coach to get to the airport.

Bob and Jeanette

Who are they?

Bob and Jeanette are a couple living in the suburbs that have two primary school aged children. They both work, Jeanette part time.

What journeys do they make?

Bob drives a lot for work and he keeps a van at home on their driveway and only goes to his local depot once a week.

Jeanette takes the bus to work after walking the children to school, leaving their aging car parked at home as town centre parking is expensive.

The couple use the train very occasionally for leisure but predominantly stay more local as the children can visit their friends on their bikes.

Bob and Jeanette travel to an edge of town supermarket to do their big shop once a week. They use their car which is old and has a diesel engine.

Susan and Graham

Who are they?

Susan is 71 and lives in a rural village with her husband Graham. Susan has reduced mobility and Graham has a disability.

What journeys do they make?

The majority of Susan's trips are local and she rarely travels more than 10 miles. The only longer distance trip that Susan takes is driving to France for her holidays which isn't as often as she'd like. Susan and her husband both have a car parked on the drive but her husband can no longer drive due to his disability.

Due to her and her husband's age and reducing health. Susan has to visit the GP more frequently. Susan likes to go shopping in the nearest market town where she also gets her hair done. Susan likes to visit her children and grandchildren when she can but they do not live on a direct bus route so she usually jumps in the car. Susan likes to take her grandchildren on days out to national trust sites.

Mike and family

Who are they?

Mike is a middle-aged farm worker who is married with two teenage children and two dogs. Mike lives in a remote location where the internet is slow. Mike grew up in the local area and his parents live in the adjacent village.

What journeys do they make?

The majority of Mike's trips are local, short journeys. A lot of Mike's trips are picking up and dropping his children off, either at the local bus stop where they get the bus to school or for various activities that they are involved in.

Mike sometimes has to drop off his children's friends which is often an inconvenience but the drop offs are reciprocated by other parents and guardians which come in handy when Mike is busy on the farm. Mike has access to three vehicles which are all petrol or diesel and old. The children often use their bikes to get around as their friends live locally and use the bus to get to school.

Defining the future of mobility

2. Defining the future of mobility

By its very nature, future mobility does not have a standard definition and it means different things to different audiences.

In this context, 'mobility' means the movement, both physically and digitally, of people, freight (raw materials, crops, components, products and consumables) and information by any available system, service or mode within the mobility eco-system.

Future mobility therefore considers new and emerging mode, service models and infrastructure, whether they be early signals on the horizon of a potential new system, growing trends of a new service or an established trajectory of a new mode.

In considering what is new and emerging, future mobility is not simply focused on technology innovation, it considers the way in which mobility is planned, specified, delivered and monitored. In doing so, future mobility is helping to change the 20th century approach of planning for vehicles to a new direction which plans for people and their needs, and the places where they work, learn, shop and play.

Signals, trends and trajectories

Future mobility, by definition, must be live to what is changing now as well as the emerging challenges and solutions.

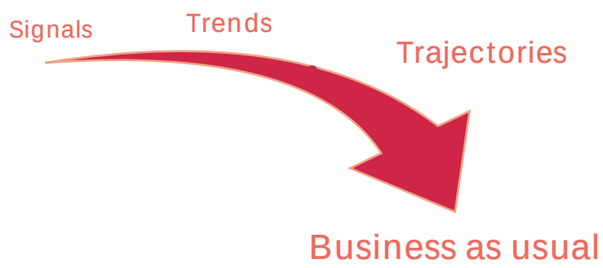
Key signals, trends and trajectories that affect mobility need to be monitored, not simply new technology but also the global, national and local changes that affect economies and communities and which may influence mobility over the coming years.

We define this thinking as follows;

Signals – the first signs of activity in a new area, which can often easily be missed. For example, the early signs of the novel coronavirus or new technology such as hyperloop or flying taxis. For the purposes of this strategy we consider signals to be immature challenges or issues, or interventions, many of which might be funded by venture capital.

Trends – instances of change where large numbers of similar pilots are being undertaken or funds are starting to flow from government or private finance to pump prime the market. Current examples include the various automated shuttles around the globe, hydrogen fuel cell deployment or the wider discussion of the rural agenda.

Trajectories – are solutions, services and interventions that are becoming established and a clear route to a new 'business as usual' can be seen. This includes EV cars & vans, DDRT, e-bikes and e-cargo bike deployment and e-scooters (subject to government findings from the pilots).



The combination of time, technical, commercial and operational maturity are the path that any technology or solution move through towards a new business as usual.

The key currently visible signals, trends and trajectories that affect the future of mobility (rather than within the field itself) are presented overleaf. These have been identified from research into major environmental, economic and social policy themes as well as the clear major shock events that the South East, the UK and the wider world face.

Whilst shock events, by their nature, are unpredictable, as the COVID-19 pandemic has proven to be, mobility has to work within an operational environment where such events can regularly occur.

Prior to the COVID-19 pandemic, the environment was at the forefront of policymaking and the future of mobility has key roles to play in responding to these challenges through reducing negative impacts, using resources carefully and reversing the damage already done.

To meet new and evolving demands and expectations mobility will need to change as the economy changes. The way people interact with the economy both as employees and consumers is altering demand for travel, both for people and goods. The future mobility strategy aims to support the mobility eco-system to evolve, with new modes, services and infrastructure, to face these challenges.

Mobility has, for many, brought significant positive social change through providing access to daily needs and social interaction including over increasing distances. The positive change has not been equally shared across communities. A changing society is also altering demands for mobility with where, when and why we travel evolving to meet altering populations, lifestyles and individual needs.

Overall, whilst the modes, services and infrastructure that form the mobility eco-system are evolving, this must be considered within the wider context of shifting demands and expectations from wider environmental, economic and societal change.

Figure 1 – Signals, trends and trajectories

	Signals	Trends	Trajectories
Shock events	Utility failure	COVID-19 Extreme weather	Terrorism
Environment	-	Eco-system breakdown Scarcity of resources	Climate change Air quality
Economic	New business models On-demand manufacturing Trend to simplicity Life-long learning	Diversification of funding Acceptance of sharing Expectation of immediacy and 'always on' Rise of the gig economy Automation Decline of physical retail Rise of the experience economy	Customer centricity Devolution of decision-making Globalisation Protectionism
Social	Shift to rural living	Older economically active population Focus on wellbeing Changing family composition Loneliness	Urbanisation Ageing population Growing population including migration Social inequality

National policy context

Mobility policy is set across Government levels; nationally, sub-nationally, regionally and by local authorities. Mobility is not simply affected by transport policy, it is intrinsically linked to wider economic, spatial, environmental and social policy.

The key central government policy driving mobility is the Future of Mobility: Urban Strategy and an equivalent rural strategy is currently under development. This document sets out the government's approach to maximising the benefits from transport innovation in cities and towns. It presents the principles that will guide government's response to emerging transport technologies and business models.

The document also presents the six high-level 'key changes' that are fueling the evolution of mobility:

- Cleaner transport: Transport is becoming cleaner as a result of the electrification of vehicle powertrains, both battery electric and hydrogen fuel cell. The UK has plans to be at the forefront of the design and manufacturing of zero emission vehicles, and the Government's commitment to banning the sale of pure petrol and diesel-powered (internal combustion engine – 'ICE') cars and vans by 2030 aims to rapidly increase electrification further and a consultation on a similar ban for buses has been announced.

  Decarbonisation and improved air quality are central to this strategy and whilst there are some interventions that specifically address these issues, the broader strategy has climate change and improving the quality of the air we breathe at its core.
- New business models: New digitally enabled mobility business models are emerging. For example, ride-hailing has significantly impacted the taxi market, particularly in urban areas and Mobility-as-a-Service has the potential to integrate currently disparate planning, booking and payment options for mobility services.

  This strategy is focused on supporting development of new models and embedding those that are commercially viable or socially desirable.
- New modes: Technology is enabling new ways of transporting people and goods. Drones, e-scooters and e-bikes, and light electric freight vehicles are just a few of the ways in which technological advancements are impacting transport.

  E-scooters are being piloted in the South East and this strategy, through partnerships and supporting trialing and research, will support other new modes to come to market and become viable across a range of different use cases.
- Data & connectivity: The increasing availability of data and improved digital connectivity is enabling travellers to have access to more journey information as well as enabling vehicles to communicate with each other and sharing information with network providers. Sharing of data may have increasing importance as modes are accessed digitally and this data could help to shape future mobility options through increased access to information through which to plan, monitor and adjust the eco-system, including in real-time.

  Digital communications are becoming vital to how we move and enabling us to undertake activities at home or remotely as well as bringing services to people via digital means thus avoiding the need to travel.
- Changing attitudes: Societal trends, trajectories and signals may continue to develop and impact attitudes towards mobility and accessibility to 2050. Road travel demand across England and Wales is expected to increase over the coming decades, however this is mainly driven by population growth. When looking at travel per person, the DfT's National Travel Survey shows people are actually travelling less. This is due to a decline in commuting driven by flexible working and working from home, as well as decreases in leisure trips.

  How we as individuals and organisations respond to new opportunities that future mobility provides will dictate how successful those new opportunities may be. Trialing and testing will be key to understanding how people interact with future mobility, but wider research should also be undertaken to understand the behavioural responses to new modes, services and infrastructure provision.
- Automation: many cars have automated the mundane tasks and are becoming increasingly advanced through evolution of their capabilities. However, there are also revolutionary approaches to automation with companies building and trialing fully autonomous vehicles (AVs) including on the roads of the UK. Nationally, companies are at the forefront of this field with several projects are expected to deploy limited numbers of self-driving vehicles on public roads and spaces over the next few years.

  This strategy aims to support the development of automation as capabilities increase, with partners working to identify the appropriate use cases, opportunities for trialing and the delivery of new modes and services as they become realistic propositions.

In addition to DfT's six key changes, this strategy identifies aggregation as the seventh trend and the strategy looks to bring greater integration within the mobility eco-system. Increasingly, different elements of mobility, modes, services, information, tickets and payments are being brought together both digitally and physically in an aggregated way. Mobility as a Service (MaaS) can digitally aggregate transport

services onto a user's smartphone, whereas mobility hubs and freight consolidation centres can physically aggregate services at a range of scales. This strategy aims to promote aggregation as a way to make mobility more efficient and connected, providing benefits for the travelling public and logistics.

This future mobility strategy has also embraced the DfT's nine principles, as contained in the Future of Mobility: Urban Strategy, namely:

- Safe and secure – through working with partners to trial new mobility propositions, the South East will provide reassurance that modes and services can provide the safety and security that users, communities and operators must have to ensure they become accepted and embedded as business as usual.
- Benefits open to all places and people – this strategy has focused on understanding how future mobility will affect different places and people and the suite of proposals provide a range of interventions applicable across the South East's communities. Supporting those people and places that are not currently well-served by mobility must be central to our actions.
- Active travel – supporting first mile/last mile journeys, encouraging behaviour change, developing a range of shared micromobility models and developing networks of mobility hubs will help to ensure that active travel is supported in providing an even greater proportion of journeys across the South East.
- Mass transit – first mile/last mile interventions, including DDRT, will work with mobility hubs and alongside decarbonisation and automation to strengthen mass transit networks, and access to them, to ensure they remain at the centre of the South East's transport network.

Figure 2 – Future of Mobility: Urban Strategy principles

Source: Future of Mobility: Urban Strategy, DfT, 2019

- Transition to zero emissions – electrification, both battery electric and hydrogen, is a priority for this strategy and proposals, working with partners, strongly support the dramatic push to ban sales of conventional petrol and diesel engine cars by 2030.
- More efficient use space – how space is used for mobility will help shape our places and communities over the coming decades. This strategy aims to set a consistent approach to the allocation and management of road, kerb and parking spaces as new modes and services start to change the use and demand for space.
- Open marketplace – this strategy takes an open approach to how emerging modes and services are provided, by private, public and third sectors. It is vital however, that there are cross-sectoral co-operation and broad partnerships working together to deliver new service models and modes that, together support all of the South East's communities.
- Shared data – A key role for the South East is to support not only the sharing of data but the wide-spread dissemination of learning from the development of future mobility solutions. This will enable new modes and services to be viably embedded across the South East through learning lessons from delivery across our range of partners.
- Integrated transport system – this strategy focuses not only on the integration of modes, services and infrastructure but also of thinking, engagement and policy. This is a comprehensive strategy covering both established and emerging modes and service models, building stronger links to the key dependencies of energy and digital communications and delivering a more integrated mobility eco-system.

Whilst this strategy has been guided by and responds to the DfT's current future mobility policy, Transport for the South East is mindful that this will continue to evolve and, indeed, following recent consultation DfT's Future of Transport: Rural Strategy is expected in 2021 which will help frame the discussion around issues facing rural communities.

Transport for the South East will work with DfT, other Sub-National Transport Bodies and our constituent local authorities to continue to shape policy in the face of the rapidly evolving mobility eco-system.

The changing mobility eco-system

Mobility is a derived demand and rarely an activity undertaken without a wider purpose. The demand for mobility stems from the need of people and organisations to fulfil their needs and undertake daily activities. In living their lives, people need access to employment, education, health and social care, retail and services, leisure, tourism and social interaction. Businesses on the other hand need access to resources, employees, raw materials and their markets.

Increasingly, the access that mobility provides is digital rather than physical, with online connectivity replacing journeys. COVID-19 has increased this rate of change with people having greater ability to access work, education, healthcare, retail and other services without leaving home. However, the longevity of this sudden increase in already growing trends is uncertain as the move to digital was reactive rather than planned with many solutions being imperfect. In recovering from the pandemic, better planned approaches to these trends may be put in place helping to capture and embed some of the positive aspects of change. This may enable people and organisations to find the 'next normal' with a 'hybrid' approach of continuing to access some needs digitally whilst also using more established physical ways of accessing needs where they prove to be more beneficial or desirable.

Some of these key trends in mobility are already resulting in changes being seen on our streets and on our connected devices. Ride-hailing and public transport tickets can already be accessed digitally using smartphone apps. There is also an evidenced shift in car ownership, with some vehicle users accessing vehicles via car clubs, or utilising other services and modes that can help negate the need to own a private vehicle. Whilst others are transitioning to EV ownership over traditional ICE vehicles.

These and similar trends are also changing how mobility is defined, not just physical or digital but also what constitutes private and public transport. Traditionally, public transport has been seen as bus, rail travel and taxis, but now, there is a much wider range of publicly available transport, accessed through both subscription and payment at the point of use. These services incorporate bus, rail and taxi but also include digital demand responsive transport, car clubs, cycle hire, ride-hailing and e-scooters.

New and emerging business and service models

Across the mobility eco-system, new business and service models have led to increased choice within the marketplace. The key business and service models influencing the mobility eco-system include:

- Ride-sharing: Ride-sharing schemes match private vehicle drivers with potential passengers (often co-workers) making similar regular or one-off long-distance trips. Examples include Liftshare, BlaBlaCar and Faxi.

  Ridesharing has the potential to expand in future especially if trip-matching functionality were to become a component of MaaS and restrictions on car parking were implemented at workplaces and within town and city centres.
- Ride-sourcing for sole use: Also called known as ride-hailing, ride-sourcing schemes match customers with available rides using a smartphone app. Users can register their desired trips and pay on account via pre-approved payment methods with prices set according to supply and demand. Sole use refers to the use by single occupants, households or groups of people who know each other (e.g. friends or colleagues) Examples include Uber and Ola.

  A number of factors have the potential to impact ride-hailing by 2030, including MaaS and the rise of AVs. MaaS roll-out has the potential to provide easier access and integrate it with other modes and services. AVs could also start to be adopted by operators to increase utilisation of vehicles (as below) with greater adoption by 2050 particularly within denser more populated areas.
- Ride-sourcing for shared use: Shared use ride-sourcing differs from sole use due to vehicles being shared at the same time by people who don't know each other making different journeys but using the same vehicle. Examples include UberPool and digital demand responsive transport such as ArrivaClick

  Ride-sourcing for shared users may follow the same trends and trajectories as ride-sourcing for sole users. As operators begin to link with MaaS schemes and adopt AVs, ride-hailing can become more accessible. Ride-sourcing could also merge with car sharing into a single business model using AVs as a shared asset which are seamlessly integrated into a MaaS platform.
- Mobility asset sharing: Customers access and share use of different mobility modes without having to own them (e.g. car, bicycle, e-scooter). Assets are generally available at permanent or semi-permanent locations and booked, paid for and located via an app.

  By 2030, mobility hubs may be more widespread, facilitating the uptake of mobility asset sharing options within communities. New models of shared micromobility could also be introduced with longer term rentals or sharing models. There could be a commensurate reduction in private vehicle ownership in urban areas due to increased and improved mobility options.

  MaaS platforms: Mobility as a service (MaaS) is the integration of multi-modal public and private sector mobility services, delivered through one or more digital platforms. It incorporates travel planning, booking, payments and in-trip information. MaaS is designed to enable customers to seamlessly access and consume mobility services to undertake end-to-end journeys meeting the individual's quality, cost and time preferences.

  By 2030, MaaS platforms could be offered across whole urban areas, however by 2050 MaaS platforms could be across whole regions or national. In the longer term, between 2030 and 2050, MaaS may be rolled out in more rural areas with less of an urban focus.
- Parking and kerb space management: These platforms provide consumers with information and app-based payment functions to reduce the traditional problems associated with finding and paying for parking or in the case of freight, loading / unloading.

  By 2030, parking and kerb space management platforms may be widely implemented enabling highway authorities to generate new sources of revenue from managing kerb space as a valuable resource. Parking and kerb space could be integrated into MaaS and used by freight and logistics operators and utilised by AV services.
- Digital-as-a-mode: The use of digital connectivity to reduce / remove the need to travel can be referred to as 'digital as a mode'. Digital access to work, education and healthcare provides for similar opportunities without physical movement.

  As an increasing proportion of the population become digitally literate there may be greater use of digital as a mode.

  More services could be available digitally in 2030 and 2050, with people accessing leisure, healthcare, education and employment more via digital means. Rural areas should see improved digital services by 2030 and continued to 2050 as digital access becomes increasingly more important.
- Operator-focused freight models: Operator-focused freight and logistics models (i.e. accessed online, in-vehicle or through mobile devices) offer operators easier access to real-time and price transparent freight and logistics services. In turn, data-driven models improve supply chain visibility and asset utilisation for operators through the likes of integrated fleet management systems.

- Customer-focused freight models: Consumer-focused freight and logistics services using increasing amounts of data and automated technologies to provide customers with a wider selection of flexible last-mile delivery and collection options.

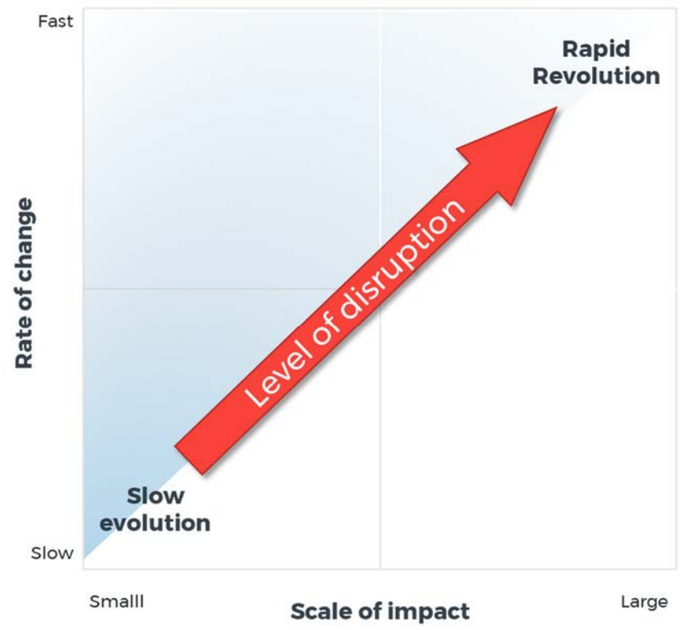
By 2030, these business models, where they have been successful, should be mature. There may be a rise of micro-consolidation centres and delivery lockers may become more widely spread as key components of mobility hubs. New modes such as aerial drones and pavement robots may be integrated into this model and new services such as in-home deliveries may be established.

By 2050, micro-consolidation centres could become more widely spread and services that may have started in urban areas may become available in rural areas. The rate of change and the scale of impact can vary greatly and often dominate discussion of future mobility. Aside from the decarbonisation debate, perhaps the most frequently discussed change is automation; when will fully autonomous vehicles become widely adopted and mainstream, and what impact will they have across the entire mobility eco-system.

The varying speeds of adoption and impacts of new forms of mobility can lead to different responses. Government policy can take months or years to formulate and adopt, and budgets are increasingly being set for longer periods (e.g. to support Highways England's Road Investment Strategy and Network Rail's Control Periods); this approach can cope better with slower rates of change – the slow evolution of mobility. However, the private sector demands a fast return on capital invested and is set up to drive what can be, with the right propositions, rapid revolutions in mobility. It is in this space, the gap in speed at which governments and the private sector operate that new entrants can significantly disrupt the mobility eco-system.

Overall, the future of mobility is very uncertain; this uncertainty is brought about by major environmental, economic and social trends, shock events, including the COVID-19 pandemic, and the development and delivery of new mobility modes, services and infrastructure. The evolution of mobility is made more complex by the responses to these changes by consumers, wider communities and organisations, and the policy and investment decisions made across the tiers of government.

Figure 3 – Level of disruption



Summary

This chapter has set out the link between the constantly evolving mobility ecosystem and how it relates to ambitions set out in government policy documents, principally the Future of Mobility Urban Strategy. The approach to defining the future of mobility set out in this strategy considers new developments in the sphere, with regard to their technical and commercial maturity, to categorise them as signals, trends or trajectories, and eventually a new normal. Furthermore, in light of the recent Covid-19 shock event, it has become even more obvious how trends can be accelerated, shaped and revealed by new pressures placed on the existing mobility ecosystem.

Increasingly, central government policy is shaping the future of mobility, as part of a decisive move away from 'predict and provide' and more towards 'vision and validate', in which policy is centred around desired outcomes for people and places, rather than the most probable outcomes based on current trajectories. This strategy is developed in close parallel with the Future of Mobility Urban Strategy and centres itself around the six key changes of cleaner transport, new business models, new modes, data and connectivity, changing attitudes and automation. It also digs in deeper to identify a seventh trend, aggregation, to consider the effects of how integrating multiple elements of mobility can make it more efficient, connected and beneficial to the public and to logistics.

No single component of the future of mobility can be considered in isolation. Instead, everything must be considered as a contingent part of a much wider and more complex mobility ecosystem which is cognisant of the ever more prevalent interactions between digital and physical forms of mobility, often enabled by advances in technology. This has recently been demonstrated by the rise of ride-hailing services and the consequent shift in car ownership trends towards 'access to', rather than 'ownership of', private vehicles. The Covid-19 pandemic has revealed such changes in ways never before envisaged, especially with regard to more and more activities that would have typically derived a demand to travel, being fulfilled online. The result is often brand-new business models, many of

which have the potential to be disruptive, dependent on the rate and scale of change.

Alongside the many positive developments identified, there are a range of potential unintended consequences which could arise from the delivery of the strategy which need to be considered. Table 1 provides a commentary on consequences across a range of future mobility themes.

The potential positive impacts could be transformational to the environment, economy and society but significant harm could also be caused. Some harms may occur without the changes future mobility may bring or may simply be made more rapid by advances in mobility. Ensuring oversight, controls and monitoring of key changes in mobility may help to mitigate any harm that could be caused.

Table 1 – Intended and unintended consequences of future mobility

	Consequences	
	Intended	Unintended
Economy	Future mobility modes and service models strengthen the existing mobility eco-system making it more efficient and higher capacity, both increasing productivity and enabling more movement in support of the economy. Digital-as-a-Mode services increase efficiency of some activities and reduce demand for travel, releasing capacity in the mobility networks. New modes and services provide commercial opportunities for businesses in the South East supporting the local economy.	Some developments may increase the demand for travel (e.g. due to the lower cost of operating electric vehicles) generating more traffic congestion, resulting in lower productivity. Productivity could be reduced in some industries by remote working due to the lack of direct human interaction. Potential opportunities for global businesses to operate mobility in the South East could exclude local start-ups and SMEs from entering the market.
Environment	Decarbonisation of mobility significantly reduces emissions that lead to climate change and poor air quality. Reduced need to travel could alter the overall environmental footprint of mobility and potentially reduce the demand for land to support new infrastructure delivery.	Demand for scarce resources to support the manufacture of new modes and propulsion methods causes environmental harm abroad. The developments and failures in new mobility modes result in early obsolescence and stranded assets generating environmentally harmful waste. Decarbonisation does not eliminate vehicle emissions that cause poor air quality (e.g. from tyre and brake wear).
People	New modes and services widen access to opportunities across society reducing isolation and exclusion. Active travel should be encouraged through new modes and infrastructure leading to healthier lives. Reduced demand for travel for a range of purposes, through the delivery of Digital-as-a-Mode services releases time for other activities and generates better quality of life.	Some sections of society may be left behind where new modes and service models do not support their particular needs, building on existing inequalities in society. New modes may compete with active travel reducing the amount of physical activity and exacerbating existing population-wide health issues. Reduced demand for some journeys increases demand for others, generating shifts in travel patterns, both temporally and spatially.
Places	New modes and service models may bring new opportunities to increase connectivity and accessibility in rural areas enabling them to catch up with urban areas.	The connectivity gap between urban and rural areas may widen if new modes and service models are not sustainable in rural locations.
Employment	Increasingly people will be able to work remotely and/or more flexibly, for some of the time and for some roles. More people will be able to work while travelling increasing productivity and providing further flexibility.	Increasing capability for some jobs to be undertaken at home or remotely may disadvantage those employees who have to travel to workplaces. This could result in some jobs, including low paid roles, having a higher burden of travel-related costs.
Education	Digital services provide more access to education remotely, reducing the need to travel long distances to learn. This may also increase the flexibility for individuals for how they learn, opening opportunities for more people who have been excluded from education.	New modes and services may require education and training in the mobility industry to enable human resources to flex to meet new demands on their knowledge and skills. Reduced physical presence alters the quality of learning.
Healthcare	Digitally accessed healthcare may reduce the need to travel to access medical and social support. This could make health services more efficient and less transport dependent whilst also reducing stresses on patients and careers. Quicker diagnosis may also generate improved health outcomes. Medical logistics is more efficient, reducing costs and increasing access to medicines for patients.	Reduced physical examination may result in inaccurate diagnoses. Reduced physical presence reduces the opportunities to identify other medical issues resulting in missed diagnoses.
Retail/ services	People have increased access to retail and services through digital services, with reduced demand for travel for these purposes. Freight and logistics for retail becomes more efficient reducing costs, cutting waste and reducing environmental harms.	Further reductions in physical retail and changes to the ‘High Street’ and town centres.

	Consequences	
	Intended	Unintended
Leisure and social interaction	Digital-as-a-Mode increases leisure time by releasing time spent travelling whilst social interactions are made easier over longer distances through video conferencing.	Travel for leisure replaces travel for work, education and retail/services resulting in lower than expected reductions in trips made.
Digital comms	Improved digital communications brings more equality in access to opportunities across urban and rural areas. Increased capacity of systems enables more aspects of the mobility eco-system to work seamlessly together increasing efficiency and simplicity.	As digital communications improve in rural areas, they improve more quickly in urban areas, resulting in a continuation of the imbalance of connectivity and accessibility.
Technology	New technologies open up new opportunities for modes, services and infrastructure increasing mobility, accessibility and connectivity for all.	Early adopters have advantages over late adopters and those unable or unwilling to engage with technology generating new types of exclusion.
Payments	Cashless and micro-payments increase the efficiency of mobility and enable new mobility markets to be developed.	Those who do not have bank accounts or prefer or rely on cash are left behind and unable to engage fully in the future of mobility.
Financial	New modes and services attract investment in areas to support their delivery.	Investment only flows to areas where there is a commercial or financial case for new modes or services unless there is public sector support.
Displacement	New modes, services and infrastructure provide stronger support for economic activity.	Activity is displaced from some areas as new modes, services and infrastructure operate in locations most advantageous to their needs.
Existing mobility	New modes, services and infrastructure integrate with the existing mobility eco-system delivering enhancements and efficiencies, making the 'whole' stronger.	Existing modes, services and infrastructure are disrupted, weakened, displaced or made obsolete by the future of mobility, damaging the mobility eco-system. Where disruption is caused but new modes, services and infrastructure fail, gaps in the mobility eco-system may appear and be difficult to fill where existing provision is no longer operating.

Vision and objectives

3. Vision and objectives

Supporting the Transport for the South East transport strategy

The overall transport policy steering decision-making in the area is Transport for the South East's transport strategy, published in the summer of 2020. The future mobility strategy is a daughter document and will sit alongside the freight strategy and five area studies to be completed by 2022.

The future mobility strategy builds on the framework of its parent document by specifically focusing on the role that new modes, services and infrastructure may play in achieving the vision and objectives of the transport strategy. It also provides support to the area studies by identifying a range of interventions that may be suitable for implementation as part of a wider suite of actions proposed by the studies and may be integrated into the Strategic Investment Plan.

The transport strategy sets out Transport for the South East's mission to grow the economy by delivering a safe, sustainable and integrated transport system that makes the South East more productive and competitive, improves the quality of life for all residents, and protects and enhances its natural and built environment. Its ambition is to transform the quality of transport and door-to-door journeys for the South East's residents, businesses and visitors.

The vision statement for the strategy is that:

> Transport strategy vision statement:
>
> By 2050, the South East of England will be a leading global region for net-zero carbon, sustainable economic growth where integrated transport, digital and energy networks have delivered a step change in connectivity and environmental quality.
>
> A high-quality, reliable, safe and accessible transport network will offer seamless door-to-door journeys enabling our businesses to compete and trade more effectively in the global marketplace and giving our residents and visitors the highest quality of life.

The vision statement forms the basis of the strategic goals and priorities that underpin it. These goals and priorities help to translate the vision into more targeted and tangible actions.

The strategic goals, aligned to the pillars of sustainability, are:

- Economy: improve productivity and attract investment to grow our economy and better compete in the global marketplace.
- Society: improve health, safety, wellbeing, quality of life, and access to opportunities for everyone.
- Environment: protect and enhance the South East's unique natural and historic environment.

This transport strategy aims to balance these three pillars to achieve overall sustainability.

Beneath the strategic goals lies a set of fifteen strategic priorities. These priorities narrow the scope of the goals to mechanisms and outcomes that will be most important to effectively deliver its vision. They are designed to be narrow enough to give clear direction but also broad enough to meet multiple goals.

The strategic priorities are as follows:

Economic priorities:

- Better connectivity between our major economic hubs, international gateways (ports, airports and rail terminals) and their markets.
- More reliable journeys for people and goods travelling between the South East's major economic hubs and to and from international gateways.
- A transport network that is more resilient to incidents, extreme weather and the impacts of a changing climate.
- A more integrated approach to land use and transport planning that helps our partners across the South East meet future housing, employment and regeneration needs sustainably.
- A 'smart' transport network that uses digital technology to manage transport demand, encourage shared transport and make more efficient use of our roads and railways.

Social priorities:

- A network that promotes active travel and active lifestyles to improve our health and wellbeing.
- Improved air quality supported by initiatives to reduce congestion and encourage further shifts to public transport.
- An affordable, accessible transport network for all that promotes social inclusion and reduces barriers to employment, learning, social, leisure, physical and cultural activity.
- A seamless, integrated transport network with passengers at its heart, making it simpler and easier to plan and pay for journeys and to use and interchange between different forms of transport.
- A safely planned, delivered and operated transport network with no fatalities or serious injuries among transport users, workforce or the wider public.

Environmental priorities:

- A reduction in carbon emissions to net zero by 2050 at the latest, to minimise the contribution of transport and travel to climate change.
- A reduction in the need to travel, particularly by private car, to reduce the impact of transport on people and the environment.
- A transport network that protects and enhances our natural, built and historic environments.
- Use of the principle of 'biodiversity net gain' (i.e. development that leaves biodiversity in a better state than before) in all transport initiatives.
- Minimisation of transport's consumption of resources and energy.

Transport for the South East has developed a framework that applies a set of principles to identify strategic issues and opportunities in the South East, in order to help achieve the vision of the transport strategy:

- Supporting economic growth but not at any cost
- Achieving sustainable development
- Planning for successful places
- Putting the user at the heart of the transport system
- Planning regionally for the short, medium and long term

This strategy sets out how Future Mobility will be used to help address these important principles.

Supporting sustainable economic growth, but not at any cost

The future mobility strategy is central to making the South East a globally leading sustainable economy where growth in jobs and prosperity are balanced with the needs of the environment or individual communities.

Decarbonisation is at the centre of this strategy with a wide range of interventions that directly combat climate change emissions and make more efficient use of our sustainable transport network.

The strategy also looks to support growth across the South East, making mobility work for our remote rural and coastal areas as much as it does for our well connected major economic hubs. The strategy supports reducing exclusion through providing support for those who can least afford mobility and ensuring that new advances in technologies do not exclude those least able to use them.

Furthermore, we are not just concerned about the movement of people in supporting the economy; this strategy identifies interventions to support the freight and logistics industry through consolidation and new ways of sharing capacity, making more efficient use of the freight and logistics networks while working to reduce the impacts of large vehicles on our communities.

Achieving environmental sustainability

In supporting the development of a sustainable economy, this strategy looks to break some of the links between economic activity and environmental harm, in particular climate change and poor air quality.

In doing so, the strategy does not just aim to reduce vehicle exhaust emissions through electrification, it also focuses on reducing the need to travel through better digital connectivity and better digital services. The strategy also aims to make more efficient use of mobility by putting mass transit at the centre of the mobility eco-system, supported by improved first mile/last mile opportunities, the development of mobility hubs and new ways to manage and allocate space used for mobility.

Planning for successful places

The diversity of places across the South East requires diversity of thinking and policy. Through this strategy, Transport for the South East aims to work with stakeholders, particularly our local authority partners to embed future mobility as business as usual across all areas, urban, rural and coastal.

Future mobility should be integrated into wider economic and spatial policy and bringing together policies for mobility, digital connectivity and energy, ensuring that the mobility eco-system both supports and is supported by these interdependent sectors.

Transport for the South East will support local decision-making by working with authorities to spread future mobility knowledge, skills and information, ensuring that capabilities match ambitions. This will help to bring uniformity of provision across places and ensure that opportunity and choice are increased in even the most remote areas of the South East.

Putting the user at the heart of the transport system

As the transport strategy has highlighted, communities across the South East vary significantly and this diversity is recognised in this strategy. The challenges that different people face vary according to their identity: their age, household make-up and life-stage, gender and sexuality, background, health and physical ability, employment and affluence and, of course, their location.

This strategy recognises those differences and the development of future mobility must be inclusive and reflect the diversity of our communities.

New modes, services and infrastructure must be designed around user needs, not just of wider society, but of different characteristics and how they intersect. The strategy aims to support the trialing of future

mobility solutions and these trials must reflect on how different people are supported or affected by them.

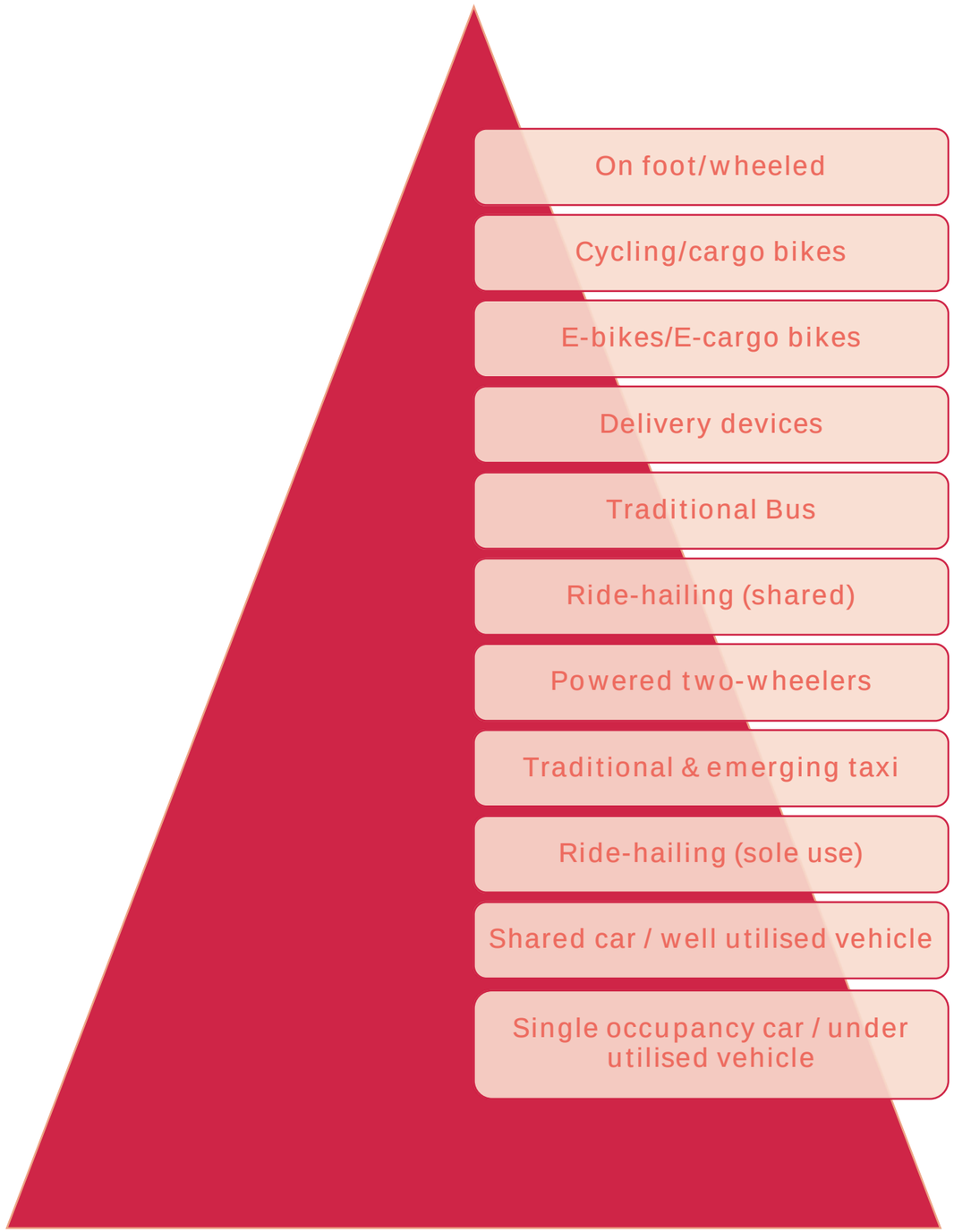
By defining a new hierarchy of modes, a clear path to reducing sole occupancy becomes clear. The pyramid in Figure 4 helps us to form a vision of how future provision should be prioritised within the 'vision and validate' framework.

More specifically, the strategy supports mass transit and better access to such systems by new modes and services, and in doing so increases choice and opportunities to share mobility, reducing the expense of owning vehicles.

A customer focus will also be supported by using technology to simplify how we plan, pay for and undertake travel, through MaaS solutions. Through MaaS, those who are excluded or isolated – economically, socially, geographically or technologically – could be supported through the development of interventions such as mobility credits.

The integration of future mobility and spatial planning policy and the delivery of changes in how mobility uses, manages and allocates space will also help to bring a greater people focus to our places, building change around users rather than vehicles.

Figure 4 – Hierarchy of modes



Planning regionally for the short, medium and long term.

Engagement with stakeholders and partners will deliver this strategy with a range of forums and tailored engagement with specific sectors. Transport for the South East will work with others to build knowledge and capability in future mobility across the South East, from supporting the development of future mobility in education and training, to disseminating findings from trialing, monitoring and evaluating the development of future mobility across the area.

Interdependencies

There are strong connections between the Transport for the South East Transport Strategy and this future mobility strategy. The former approaches these issues more broadly through the entire spectrum of the present mobility eco-system, while the latter focuses on these issues through considering the signals, trends and trajectories of change. These interdependencies link the two strategies closely together; Table 6 provides a commentary on these interdependencies.

Table 2 – Strategic interdependencies

Interdependency	Detail
Climate change / crisis and our environment	The future mobility strategy supports the Transport Strategy and wider policy drivers to achieve the net zero target as a key priority particularly with regard to the role of electrified mobility.
Energy and decarbonisation	Electrification of both established and new modes (battery electric and hydrogen fuel cell) will generate significant demand for energy generation and for this to be zero carbon. New infrastructure is required to support the supply of both electricity and hydrogen. Within local areas, the energy supply networks may limit the ability of developers, organisations, fleet operators and consumers to transition to zero carbon propulsion. Networks also require adaption to enable smart generation, supply and storage to make the most efficient use of energy and related networks
Space/Land use	With the exception of Digital-as-a-Mode, all new mobility services require space and in the South East this is becoming an increasingly scarce resource. This strategy proposes consideration of how future mobility will change demand for and use of space and this will be key to merging new and established modes and services alongside the infrastructure that supports them.
Long-term impacts COVID-19	The impact of the lockdown and move to a 'next normal' presents short, medium and potentially long-term challenges to the economy. This may impact on the delivery of both strategies through changes in funding availability and the commercial viability of modes, services and infrastructure interventions. However, there may also be opportunities to lock-in some of the positive mobility trends seen during the pandemic.
Brexit implications	Uncertainty over trading internationally may constrain and reduce investment and the long-term economic impact of the final trade agreements is unknown. This strategy has been developed through this period of uncertainty and need to be flexible in approaches to any challenges that appear. [Update may be required prior to publication of the strategy].
Shifting Mobility / Transport Modes	Future mobility blends new with established modes but this can cause significant disruption and uncertainty in those existing markets. This could lead to challenges in delivering the wider Transport Strategy where it is based on the continued development of established modes in their current form. However, future mobility also provides opportunities to support and enhance established modes through, for example, improvements in planning, ticketing, payments and propulsion.
Digital Communications	Strong digital networks will be necessary to support future mobility interventions, and, increasingly, the evolving established modes, networks and services. The development of digital connectivity through superfast broadband and 5G promises to help transform mobility. However, spatial variability of communications means that, at present, some rural areas lag behind core urban areas, limiting the reach of some future mobility interventions.
Changing behaviours	Established transport modes and service networks have long struggled to change traveller behaviour to encourage a shift from private car to sustainable modes. Future Mobility interventions also face challenges from behaviours such as the acceptance of sharing, concerns over the safety of autonomous vehicles and inappropriate use of micromobility modes.
Integrating Spatial Planning:	As with many changes in transport in the past, such as the rise of the private car and containerisation of freight, new modes can present significant challenges to established land use patterns. However, future mobility also presents opportunities to redress previous negative impacts of transport by reducing the need to travel, helping to meet zero carbon targets, reduce car dominance and rebalancing space towards people and communities.
Driving Economic development and employment	A key driver for both strategies is to support planned economic growth within the South East. This focuses on delivering sustainable development and limiting the negative impacts of resulting demand whilst also facilitating the necessary movement of people and goods.
Human capital education and skills resilience	Although automation may have a significant impact on how humans operate vehicles in the medium and longer terms, they will still play a key role in the planning, management, operation, maintenance and improvement of the mobility eco-system. The shape and size of employment in mobility is likely to evolve and the workforce will need to adapt to the news skills needed.
Health and wellbeing agenda	The transport industry needs to work towards reducing its impacts on the health of communities through improving air quality, facilitating more active lifestyles, reducing noise and limiting the impacts of infrastructure on communities. The unforeseen and unintended consequences brought about by changes to the mobility eco-system also need to be considered in delivering the strategies, such as the potential for new modes to reduce physical activity by competing with walking or cycling.

Changing nature of retail and services	Changes to the retail and services markets are continuing, both contributed to by some aspects of mobility (e.g. accessibility of town centres) and impacting on mobility (e.g. the rise of online retail related deliveries). Both strategies need to reflect changes in these markets, harnessing positive changes (such as increased access to services remotely without the need to travel) and helping to mitigate negative impacts (such as the decline of retail in the 'High Street'.
Reliance upon freight and logistics	Transport policy often focuses on the movement of people but freight and logistics, particularly in a world of increasingly digital consumption, is vital to the functioning of the economy. Providing for and managing the movement of raw materials, crops, components, goods and products within and through the South East are central to both the Transport Strategy and the future mobility strategy.
Importance of international gateways	The South East both generates and attracts international movements but is also a gateway to the UK, Europe and the global economy, through which people and goods pass. The Transport Strategy faces the challenges in international transport and the future mobility strategy has a role in supporting the meeting of those challenges. The long-term impacts of COVID-19 and Brexit on international travel are unclear but they could substantially change the demand and how people and goods travel.
Devolution of decision-making	Both established and future mobility interventions could be delivered under devolved decision-making and funding arrangements following any further development of the Sub-national Transport Bodies and City Regions. However, a significant proportion of delivery will be undertaken by other tiers of government, in particular local authorities.
Securing funding and investment	There is a wide range of funding sources available to deliver the strategies, but the availability of funding is limited and may become more so following the economic and fiscal impact of COVID-19. Building the case for funding will be vital but the evidence to support such cases is limited for future mobility, therefore, this strategy aims to support the trialing, testing, monitoring and evaluation of new modes, service models and infrastructure to support the development of business cases for investment. Government policy is a key driver of funding and national priorities may change over time affecting where strategies need to focus to secure funding.
Influencing regulation and legislation	Changes have already been made to the regulatory and legal framework to support the development of future mobility including those related to autonomous vehicles, for example. In addition, rapid changes have been made to legislation and piloting to test e-scooters in response to mobility issues related to the COVID-19 pandemic. Changes also continue to be made to support the further development of established modes (bus franchising for example) and this may need to continue to support future mobility interventions.
Capitalising upon partners and stakeholders' skills and enthusiasm	Transport for the South East will need to work with partners to deliver both strategies. Those partners range across the public sector, private sector, academia and the arts, focusing on transport and a wider range of dependent and supporting sectors. Transport in the UK relies in many instances on an open marketplace and Future Mobility may continue to require market-driven investment alongside public sector funding to deliver interventions.
Enhancing ongoing programmes and proposals	There is a range of existing transport programmes and proposals, across a number of partners and stakeholders, which delivery programmes of both strategies will need to be cognisant of and align with to deliver objectives and outcomes
Data	The collection, analysis and sharing of data is key to the future of mobility and this strategy aims to support partners in setting up appropriate structures to facilitate the open distribution of the data needed to deliver new mobility solutions and enhance those already in operation
Marketplace for mobility	The mobility eco-system is currently a mixed market of delivery with public, private and third sectors actively involved in delivery. Private sector operating commercially viable and taking risks to develop innovative solutions, public sector specifying and delivering where market cannot. Third sector plugging gaps where private and public sectors are unable to provide for specific needs.

These interdependencies demonstrate the strong links between the Transport for the South East transport strategy and the future mobility strategy and that they are responding to many of the same challenges and opportunities. This highlights that future mobility cannot be looked at in isolation but must be an intrinsic part of wider policy and strategy development.

The vision for future mobility

Taking a lead from the Transport for the South East transport strategy, with consideration of the interdependent links between the two documents, a specific vision has been developed with stakeholders to steer the development and delivery of the future mobility strategy.

Future mobility 2035 vision

"By 2035, the South East of England will have a globally leading sustainable mobility eco-system accelerating the move to net zero. The region will be at the forefront of innovation, integrating new technologies, modes and services with digital communications and energy networks. People and all the places they live, work, learn and play, will steer our actions, ensuring the future of mobility is inclusive of and responsive to their needs and provides opportunities and choices for all".

Our objectives for future mobility

The vision is supported by a number of more detailed objectives which the strategy and its interventions aim to achieve over the period to 2035. These have been informed by the transport strategy and aim to complement its objectives and have been developed in consultation with the Steering Group over the course of the development of this strategy.

Future mobility strategy objectives

- Future mobility will play a central role in helping decarbonise the transport eco-system through the provision of electro-mobility modes and services to help reduce dependency upon the sole occupancy, private car irrespective of propulsion type.
- Active travel will be the first choice for local journeys, for those who are able, supporting better air quality and the improved wellbeing of communities.
- Zero emission mass transit will be at the centre of the mobility ecosystem, reducing car dependency and ownership.
- The connectivity, capacity, efficiency, reliability and resilience of the mobility ecosystem will be optimised, making best use of existing assets and investments in services and infrastructure.
- Future mobility will be integrated with the established passenger and freight/logistics transportation networks, delivering safe, seamless journeys and making planning, using and paying for mobility simpler and easier.
- Future mobility will be integrated with spatial and economic planning, making high quality people-focused places, securing funding, supporting investment in the region's economy and targeting investment where it is needed most.
- The mobility eco-system will be people-centric and accessible to all, supporting the lives of everyone through integrating the needs of communities and urban and rural places, with policy, modes, services and infrastructure.
- Fit for purpose digital connectivity will be universal, improving access to services and reducing the need to travel.

Summary

The vision and objectives, alongside understanding of the interdependencies and the key signals, trends and trajectories have been used to identify a range of potential strategy interventions. The objectives, alongside the vision, goals and priorities for the Transport for the South East Transport Strategy, and the Future of Mobility: Urban Strategy key principles, have then been used to sift and prioritise the interventions, through a Multi-Criteria Assessment Framework, to form the overall proposals presented later in this document. The objectives will also drive the monitoring and evaluation of intervention delivery providing a focus for measuring success, as set out in Section 8.

Customer-centric mobility

4. Customer-centric mobility

Focusing on people and places

In planning for the needs of people and organisations, it is not simply sufficient to understand what their general needs are, in the form of employment, education, healthcare, etc. It is necessary to understand how needs vary from person to person and from place to place, and how these varying needs will affect peoples' propensity to use different mobility modes, services and infrastructure. Future mobility thinking is not simply bringing forward new modes and services, it is changing the way systems in which they operate are planned and in doing so is putting the users at the heart of the system.

People

The mobility eco-system needs to reflect the diversity of the people and communities in the South East. Without this reflection, there will continue to be people who are economically, socially, geographically or technologically isolated and unable easily to access their needs and play their full part in their communities and the economy.

In practical terms, this means not just planning for people but for the different characteristics that make up individual identities. People's interaction with mobility differs for many reasons; their characteristics, and how these come together to form their identities, can have a direct impact on the ability of mobility to serve each individual's needs.

The following characteristics have been identified as having potential impacts on access and mobility:

- Age – the young and the old are less likely to have access to cars and rely on public transport. The younger generations are more engaged with innovations leaving older generations behind.
- Background (ethnicity, religion, culture, race, ethnicity, language) – cultural needs and differences are often overlooked when considering transport interventions and services, language can also be a barrier to behavioural change and safety and security is a key consideration for many ethnic minorities.
- Gender and sexuality – some people are more affected by personal security issues when travelling than others, leading to fear of travel at certain times or in certain locations. Technology is also often designed from a male perspective.
- Disability – people with physical and hidden disabilities are underserved by mobility with infrastructure required above minimum standards.
- Life-stage – users of transport and mobility options can have different accessibility needs depending on their stage of life. Families with children will require greater access to education establishments but also may require more space in vehicles to allow for prams or buggies. Retired people may have more flexibility in when they travel than those in work, but they may be less able to use active modes and have specific accessibility needs.
- Employment status – mobility affects employment status through proximity and ease of access to workplaces. While the ability to work remotely or from home affects the need for travel.
- Affluence – affordability of different transport modes strongly influences choices and where choice is limited users may be forced to use less affordable modes. In rural areas, people spend higher proportions of income on travel due to the reliance on private car use and ownership.
- Household make-up – Household make-up can impact transport requirements and choices. A car shared across multiple household residents may be more affordable than for a single occupancy household. However, travel as a large household by publicly-available modes can be more expensive.
- Access to banking – there remains a significant proportion of the population that do not have bank accounts and make payments only with cash. This can limit access to modern payment systems.

Intersectionality is the layered interaction of personal characteristics that come together to form individual identities. Intersectionality is important when considering the above characteristics, and their influence on disadvantage and discrimination. Users with multiple characteristics can experience an added layer of complexity in terms of accessibility and further consideration may be required for mobility and transport options.

In developing this strategy, Transport for the South East has considered how communities vary across the area and how demographics are changing and will continue to change over the coming decades. Some of the major environmental, economic and social trends have been investigated and how these may affect communities in the area has been identified. In analysing the different future mobility service models, an assessment has been made of how these meet the needs of different groups of people within the South East. To do this, a range of social population segments have been developed which reflect the key characteristics and differences in the people and communities across the area.

The sources of data used to create and profile the segments include the 2011 Census, the National Travel Survey and an on-line survey of 2,000 people which examined attitudes towards various social and technological trends. The analysis is provided in the accompanying technical report.

The specific segments that have been identified are as follows and are presented spatially in Figure 5 (p.22).

They have been mapped using the Office for National Statistics Output Area Classification base with the dominant segment identified for each 1km square (approximated as hexagonal cells or 'hexcells')[3].

Table 3 – Current segments

	Applicability
Village life	The population of this segment live in areas that are less densely populated, typically in a village or small town. They tend to be older, well-educated and live in owned detached properties, although an above average proportion live in retirement homes. Households have multiple cars, with these being the most common method of transport to places of work.
Central connectivity	The majority of people in the Central Connectivity segment live in relatively densely populated urban areas. They include an above average proportion of young adults without children, including full time students. They tend to live in places where they can walk, cycle or use public transport to get to work.
Family terraces	This segment typically live on the edge of a town centre, in the transitional areas between the core and the suburbs. There is an above average proportion of families with pre-school or school age children. Typically, they will have one car between two adults, with one driving to work and the other walking or using public transport.
Service sector workers	The Service Sector Workers segment tend to live in terraces or semi-detached houses in urban areas and work in the information and communication, financial, public administration and education related sectors. There is an above average likelihood of having young children in the household and a below average likelihood of older age adults.
Comfortable 'self-sufficiency'	Those in this segment are typically approaching retirement age or already retired. They tend to live in suburbs, small towns and villages in detached properties or flats and are quite likely to have paid off their mortgage and have no dependent children. Therefore, while they may have a modest income are still quite likely to have both time and money.
Semi-detached suburbia	these people will typically have school age children and own at least one car. They will mostly work in information and communication, finance, public administration and education sectors. It also includes some recently retired people living in semi-detached or detached housing.
Traditional towns	Households in this segment are more likely than average to have older non-dependent children and to live in semi-detached or terraced properties. Their level of qualifications tends to be lower than average with jobs typically in the wholesale and retail, energy and transport related industries
Sparsely populated	Locations with very few people living there (less than 50 people per 1km^2)

The segments above have different mobility needs which are influenced by various characteristics that make up each segment. For example, 'Village life' may be more dependent on car use than 'Central connectivity' due to living in less dense areas with greater car ownership whereas 'Central connectivity' live in dense area where walking and cycling are more likely to be viable options. 'Family terraces' may require links to education whereas a focus for 'Service sector workers' is connections to employment locations.

The signals, trends and trajectories set out earlier have been reviewed to determine how these may shape changes in the social segments over the coming years.

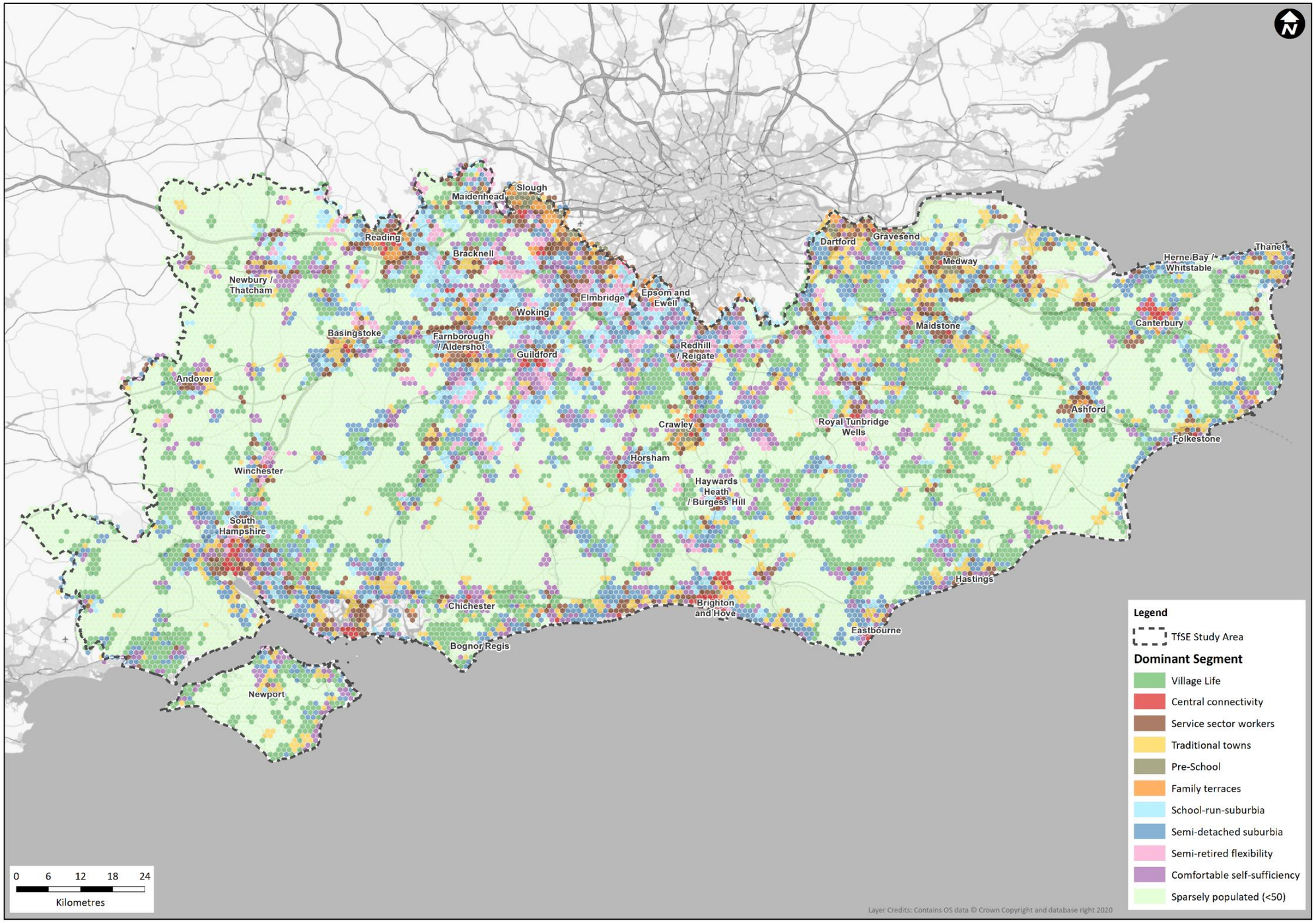
Analysis has shown that these changes may cause the appearance of new sub-groups shown in the following table. This approach is central to the future mobility strategy – matching the needs of people with the various service offerings – to understand the potential to achieve real and lasting change.

Table 4 – New segment sub-groups

	Applicability
Pre-school	A significant increase in younger people, living in urban areas, who are more concerned over the environmental issues focusing on minimising consumption including home-working and sustainable modes of transport.
Semi-retired flexibility	A gradual increase in older people at the latter end of their working lives, in better paid roles, who can take a more flexible approach to working hours and the days they work.
School-run suburbia	A growing segment of suburban families who, within their means, try to take action to reduce their environmental impact including reducing the impact of their travel choices.

[3] With the exception of number of 'sparsely populated' hexcells which have less than 50 residents living there which have not been allocated to one of the segments.

Figure 5 – Distribution of social segments across the South East



Places

It is not only the characteristics of individuals or communities that influence their interaction with mobility; the type of place in which they live also plays a major role in determining whether different mobility solutions are suitable for the people who live there.

The South East has a significant diversity of places from major economic hubs, to remote rural, city centre to village and landlocked to coastal. The area has strong links to London with large centres on its periphery whilst there are also major centres on the south coast, distant from the capital and less influenced by its travel to work area. Between the London-centric centres and the coast are other large urban areas within a more sparsely populated rural environment set around Areas of Outstanding Natural Beauty and the South Downs National Park.

As part of the work to develop this strategy, the spatial make-up of the South East has been analysed to reveal what types of place there are and how people are distributed amongst them. Four broad types of place have been identified:

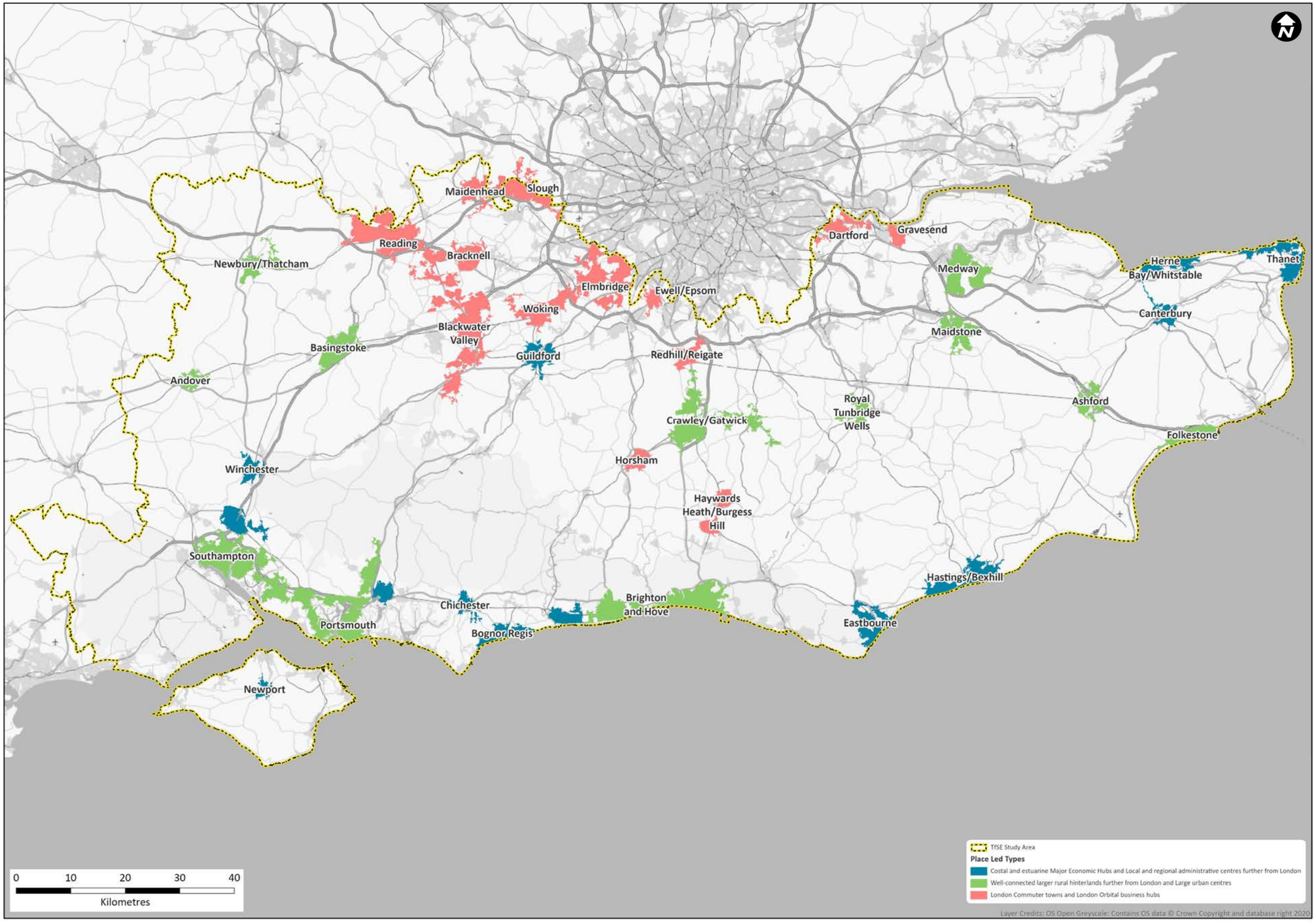
- Major economic hubs;
- Urban areas;
- Rural settlements; and
- Remote rural settlements

The Major economic hubs (MEHs) are the economic drivers of the South East's economy and the focus around which the other, smaller settlements are concentrated. Approximately 4.7 million people live within the MEHs, accounting for over 60% of the South East's population of 7.5 million. The MEHs have been defined within a number of distinct typologies as presented in Table 5, the distribution of which is presented in Figure 6.

Table 5 – MEH typology

Group	Description	No.
Coastal and estuarine Major Economic Hubs (e.g. Bognor Regis, Eastbourne, Hastings/Bexhill, Herne Bay/Whitstable and Thanet)	These MEHs are less well connected to London, meaning they are less attractive to London commuters, which contributes to higher levels of self-containment. They have relatively low skilled and wage/salary levels of jobs.	6
Well-connected larger rural hinterlands further from London (e.g. Andover, Ashford, Crawley/Gatwick, Basingstoke, Newbury/Thatcham)	Although many people commute to London from these MEHs, thanks to their excellent rail connections to the capital, they also have relatively high levels of self-containment themselves. These MEHs are important regional centres in their own right and are 'net importers' of labour from large, rural catchments	8
Large urban centres (e.g. Brighton and Hove, Medway, Portsmouth and Southampton).	The largest urban centres in the South East area. Home to industries and public institutions, including hospitals and universities. High levels of self-containment but are also well connected to London and are attractive to London commuters and are therefore net exporters of labour. It should be noted that while there is a lot of self-containment in these large urban centres, there are also significant commuting flows within them.	15
Local and regional administrative centres further from London (Canterbury, Chichester, Guildford, Newport and Winchester):	These MEHs have lower levels of self-containment with many more jobs than workers. As historic, administrative centres (e.g. county towns, cathedral and university cities) they are often desirable places to live but are constrained from expanding to accommodate more housing due to 'greenbelt' and environmental constraints (e.g. National Parks and Areas of Outstanding Natural Beauty). As such, they have high levels of 'net-importing' of labour	7
London commuter towns (e.g. Blackwater Valley, Epsom/Ewell, Gravesend and Woking	These MEHs have higher levels of commuting to London and other nearby Major Economic Hubs. They are generally well served by the railway network and are within easy reach of London. As such, they are typically high 'net exporters' of labour.	12
London Orbital business hubs (e.g. Bracknell, Dartford, Redhill/Reigate, Maidenhead, Slough):	These MEHs, are net importers of labour but also have high levels of out commuting and low levels of self-containment. These are typically areas located close to the M25, which have been successful in attracting investment into employment areas, but also have good rail links to London. These centres are attractive to both London commuters and local workers.	6

Figure 6 – Major economic hubs



Alongside the MEHs are other urban settlements, (also see Figure 7), accounting for approximately 1.8 million residents or 24% of the South East's population. These settlements have been categorised according to the MEH that they have the strongest connections to and they tend to reflect the conditions in those MEHs in terms of their relationships with the wider South East. These urban places, as highlighted in Table 6, have an average population of 16,500 but their scale varies significantly with the largest having a population of 133,000 and the smallest, 5,000.

Table 6 – Urban settlement typology

MEH type	Urban type	No.
Coastal and estuarine Major Economic Hubs	Coastal Urban (e.g. Dover, Northfleet & New Haven)	27
Well-connected larger rural hinterlands further from London	Well Connected Urban (e.g. Hawkinge, Tonbridge & Rochester)	24
Large urban centres		
Local and regional administrative centres further from London	Local Centres Urban (e.g. Liss, Petersfield & Cranleigh)	18
London commuter towns	London Commuter Urban (e.g Fleet, Southwater & Ashstead)	24
London Orbital business hubs	London Orbital Urban (e.g. High Wycombe, Sevenoaks & Windsor)	16

The larger rural settlements have also been categorised in the same way, as shown in Table 7 and Figure 8. These places account for 9% of the total population of the South East, amounting to 700,000 residents. These settlements range in size from approximately 150 residents to almost 5,000 but they have an average population of approximately 1,200 people.

The remaining rural population of approximately 300,000 live in small villages, hamlets and dispersed dwellings across the South East in places with less than 140 residents.

Table 7 – Rural settlement typology

MEH category	Rural Type	No.
Coastal and Estuarine Major Economic Hubs	Coastal Rural	65
Well-connected larger rural hinterlands further from London	Well Connected Rural	249
Large urban centres		
Local and regional administrative centres further from London	Local Centres Rural	141
London commuter towns	London Commuter Rural	94
London Orbital business hubs	London Orbital Rural	44

This analysis has enabled the South East to be categorised into distinct areas which provide their populations with differing levels of accessibility to daily needs and connectivity with the wider area. The following section applies this typological approach to understanding the interaction of place with future mobility service models.

Figure 7 – Urban areas

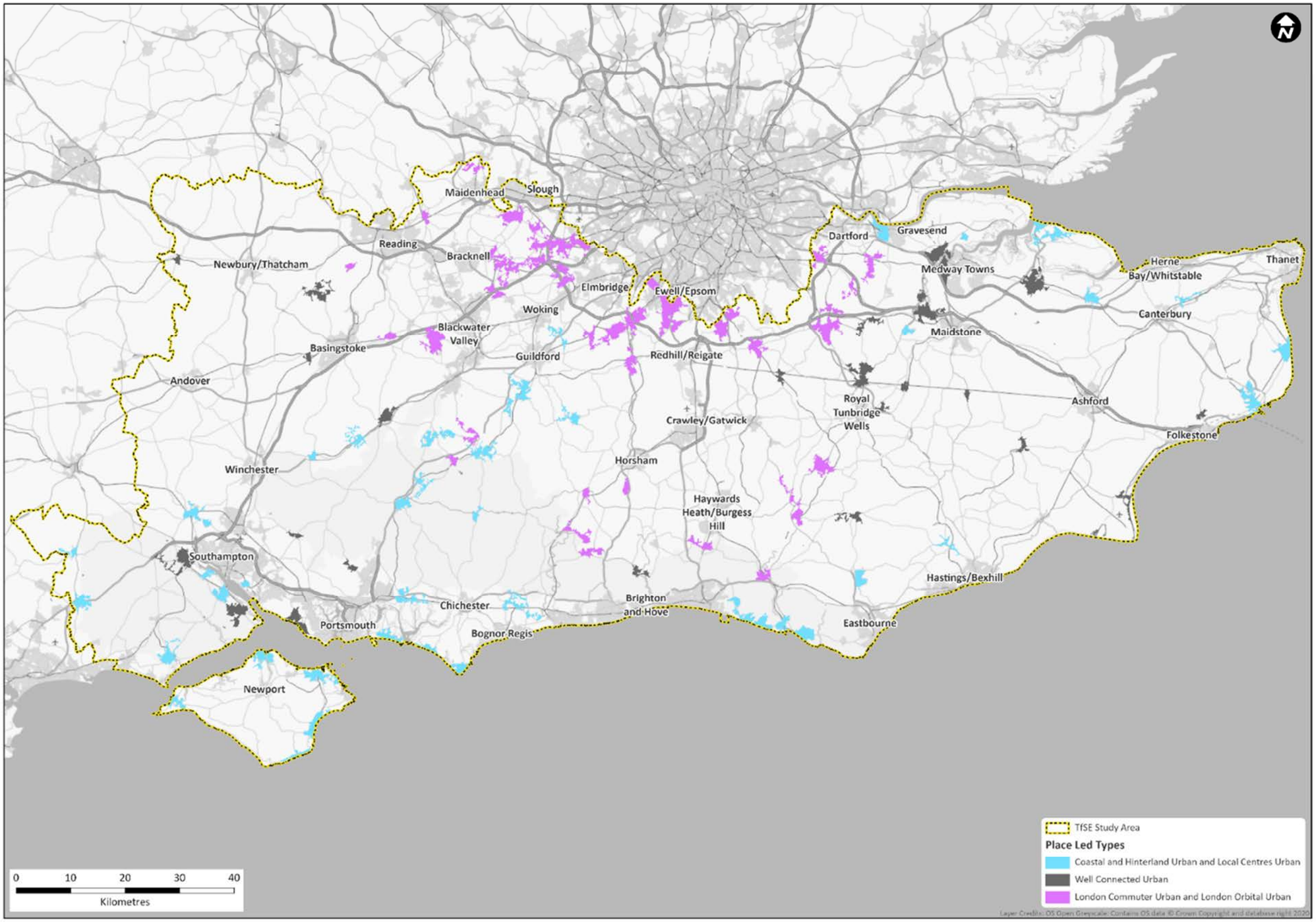
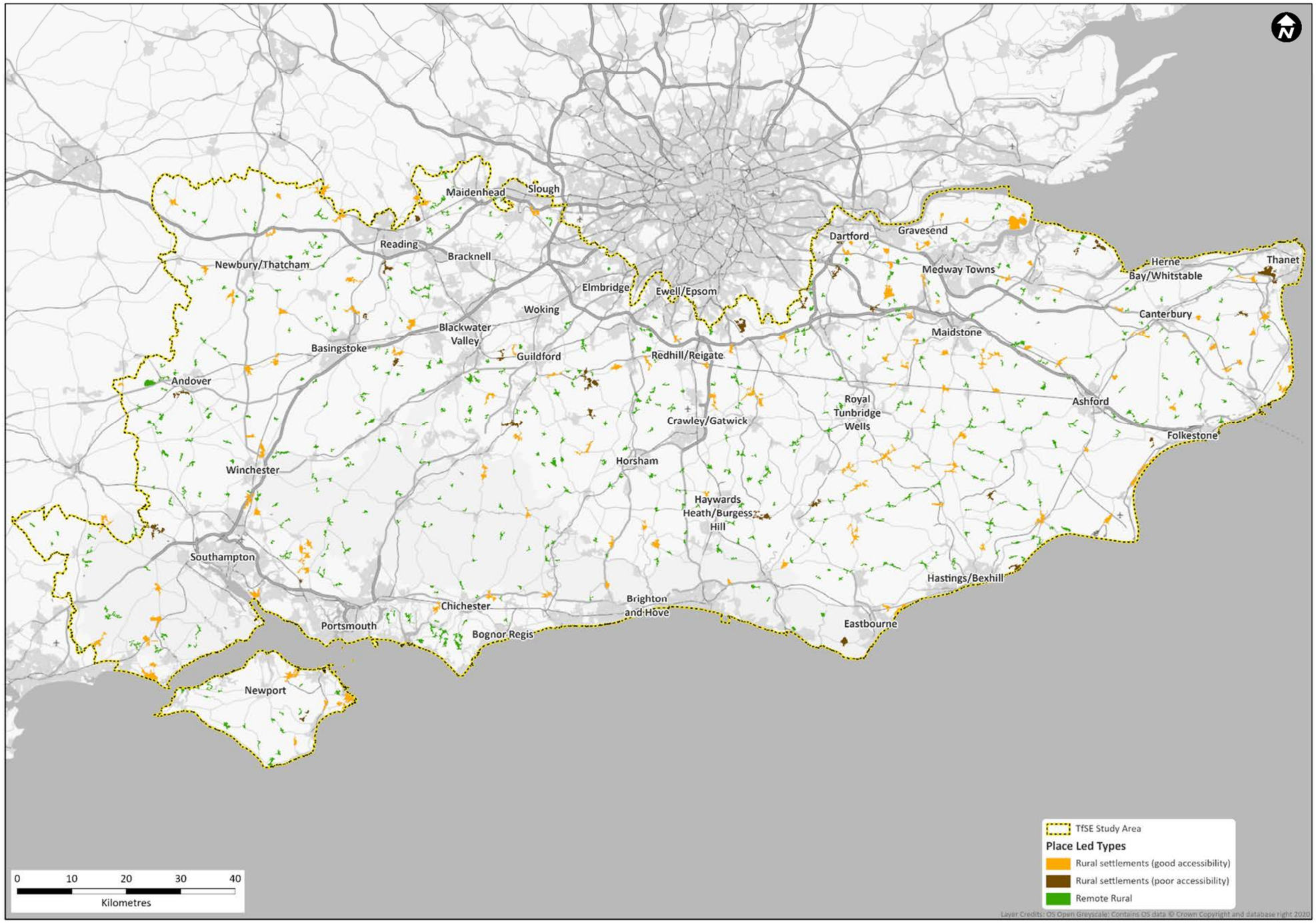


Figure 8 – Rural and remote rural areas



Impact of place on mobility

The extent to which transport and mobility serve these different areas, and their populations, communities and economies, varies greatly.

Generally, the MEHs have the most developed transport systems, with the stronger public transport networks and generally better connections to the strategic and major road networks. However, these areas will also suffer from the highest demand for travel and resulting in the most significant traffic congestion and public transport loading.

The other, smaller urban areas whilst having well-developed public transport networks, these networks are not as strong as those in the MEHs and there tends to be greater reliance on car travel as a result. Whilst some of these towns provide significant levels of employment, there will also be out-commuting to the nearby MEHs.

Rural areas will tend to have the poorest level of public transport provision and, due to their lower and less dense populations, have less provision of local services and employment opportunities. Rural dwellers therefore have greater reliance on private car use and greater demand for travel outside of their local areas for services and work.

The role that future mobility modes, service models and infrastructure may play in the MEHs, urban and rural areas may also vary significantly. Due to the scale of the markets, new commercial entrants tend to focus on larger settlements whilst in rural areas the populations are small and less likely to offer the private sector commercial viability for many of their proposals.

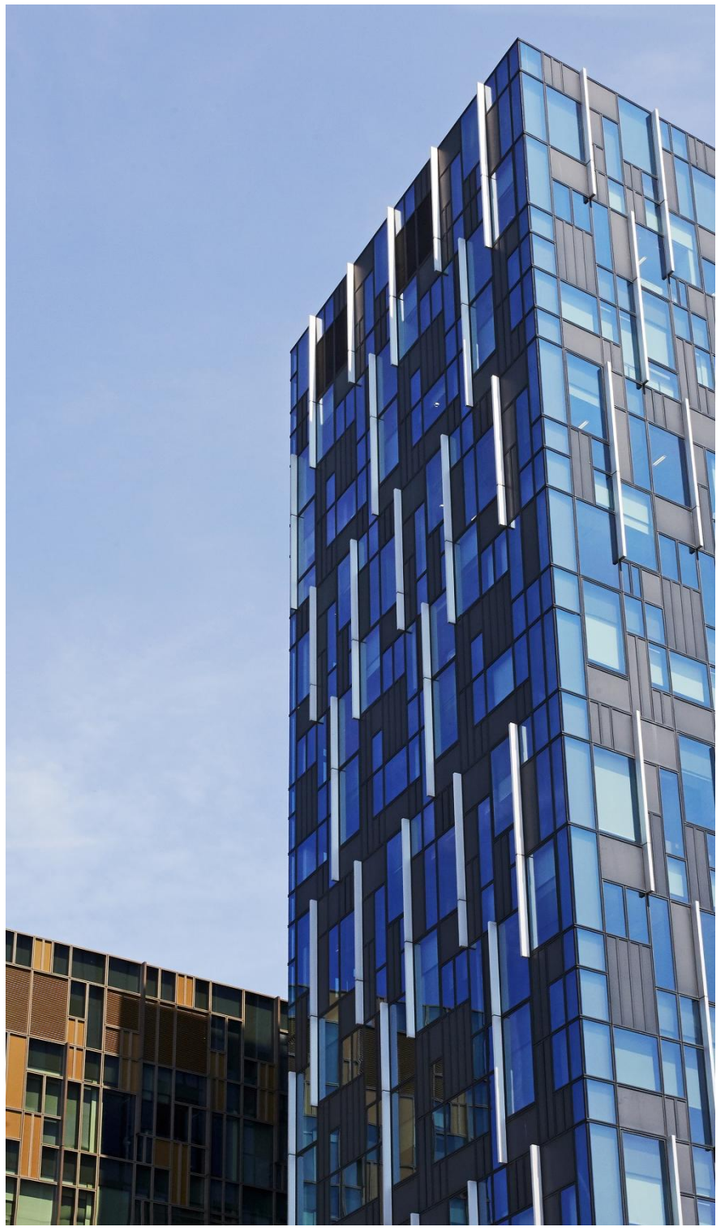
Whilst some new entrants to the mobility market may not have commercially-viable products in some places, they are not necessarily undesirable in those places or could help to user needs. Some of the new service models may generate more demand in rural areas than their urban counterparts. Rural journeys tend to be longer and more complicated, with lower level provision for public transport and active travel. Therefore, the increasing ability of the population to access services digitally may lengthen the reach of services supporting a range of daily activities (work, shopping, healthcare, etc). However, digital services cannot replace many needs that require physical mobility and the rural population continues to need better physical access and connectivity. Furthermore, the ability of communication networks in rural areas to support digital solutions varies greatly and are often poor compared to the urban networks.

The imbalance can be demonstrated by the commercial ride-sourcing offerings focusing on the MEHs and only slowly reaching out into other urban and, in some cases, rural areas. This leaves an imbalance in provision with more highly populated areas taking advantage of new opportunities, often with no or limited investment from the public sector. Whereas the less populated rural and coastal areas continue with the existing mobility eco-system that does not always meet the needs of communities and the economy. This leaves the public sector with a role in supporting the delivery of future mobility in these locations through investment to support the initial deployment by commercial partners or to support the longer term sustainability of services.

Summary

This section has highlighted the significant diversity of both communities and places in the South East of England and that to shape a future mobility eco-system, it needs to be planned around the specific needs of different types of people and place.

The section has also highlighted the disparity in experiences of mobility by people with different characteristics and how provision of mobility differs greatly between different places. A major challenge for the future of mobility is rectify these imbalances through the provision of new modes, service models and infrastructure



Developing people and place-based interventions

5. Developing people and place-based interventions

Overview

In order to be successful any future mobility strategy must be comprehensive and multi-faceted; the complexities and breadth of the mobility eco-system need to be recognised in the range of interventions included. This future mobility strategy is outcome focused, driven to achieve its vision and objectives; a vision and validate approach, rather than the historic predict and provide, setting what we want to achieve and shaping the strategy around those aims.

Traditional transport strategies have often focused on where problems exist, using established approaches to face the challenges posed. A future mobility strategy cannot, by definition, simply follow that pattern. This strategy while helping to face many of the current and looming challenges also helps to facilitate change by supporting piloting, evaluating and deploying new approaches and solutions to the mobility eco-system.

Long list development and prioritisation

A long list of potential interventions was drawn up based upon inputs including the previous Future Transport Technology Report, Transport for the South East and partners via stakeholder engagement and wider views from the supporting consultancy team.

The long list brought together a wide variety of interventions from the physical delivery of modes, services and infrastructure to the development of policy to support their delivery and from the strengthening of engagement and collaboration to the monitoring and evaluation of progress in delivery.

Whilst the long list presented well-considered and practical actions to deliver future mobility across the South East, a priority needs to be applied to the actions to ensure effort is focused on the most beneficial and deliverable activities.

The long list of interventions was therefore sifted using a Multi criteria assessment framework (MCAF) to focus action on those interventions which would deliver most for the South East. The output from this process is provided in the supporting technical document

Applicability to people and place

This strategy does not simply consider those interventions which benefit the South East as a whole but focuses on how they support different types of people and the variety of places in which they live and work across the region. To make sure the strategy is relevant at these local rather than regional levels, a further assessment has been undertaken to develop bundles of interventions which could be delivered according to the types of place. The details of this assessment are provided in the supporting technical document.

The starting point for this further analysis, presented in Figure 9, was the separation of the long list into different intervention types;

- Mode, service model and infrastructure interventions;
- Engagement and policy interventions; and
- Delivery interventions;

The following mode, service model and infrastructure interventions were adopted for the analysis, again agreed with the steering group to inform the development of the strategy:

- Shared mobility - e-bike;
- Shared mobility - e-scooter;
- Shared mobility - P2W (powered two-wheeler);
- Shared mobility - peer to peer vehicle sharing;
- Shared mobility - ride-sharing platforms;
- Shared mobility - business to customer vehicle sharing (e.g. car club);
- Shared mobility - Ride-hailing - 'on-demand private hire/taxi';
- Shared mobility - digital demand responsive transport (DDRT);
- Automated (and ultimately autonomous) road mass transit;
- Automated (and ultimately autonomous) First Mile/Last Mile shuttles;
- First Mile/Last Mile Delivery Robots / shuttles (land-based);
- Low level air (drones) – passenger;
- Low level air (drones) – freight;
- Shared mobility - e-cargo bike;
- Digital-as-a-mode communications / services;
- Hubs (mobility / community asset / service);
- MaaS platform (including mobility credits and 'gameification'[4]);
- *Digital kerbside management applications;*
- *Consolidation centres (regional, urban, micro);*
- *Business to business freight capacity exchanges;*
- *Business to customer freight capacity exchanges*

[4] Gamefication is the use of techniques from the gaming industry to nudge and reward behavioural change

- *Flexible streetscape;*
- *Road space reallocation to future mobility modes e.g. lanes, kerb space;*
- *Hydrogen refuelling infrastructure (all modes); and*
- *EV charging infrastructure (all modes).*

It should be noted that the operational freight, flexible streetscape and 'refuelling' interventions highlighted in italics above have been excluded from the 'people' element of the following analysis due to their use being freight or mobility operations focused rather than passenger transport focused.

Applicability analysis

Key to delivering future mobility within the South East is identifying the right interventions for the specific types of people and the places they live and work. Through analysis of people segments and place types, a set of future mobility intervention bundles have been developed appropriate for delivery in those areas. These bundles have been developed through an assessment of the applicability of individual modes, service models and infrastructure to the needs of users and places and how deliverable they may be considering the operational conditions, as they currently are, across areas within the South East.

The starting point was an assessment focused on the mobility and accessibility needs and challenges faced by people in general and assessing how these vary between population segments. The needs and challenges included, amongst others:

- Journey time;
- Frequency;
- Affordability;
- Reliability;
- Safety and security;
- Customer experience;
- Value for money; and
- Digital connectivity.

An assessment was then made of how well each of the mode, service model and infrastructure interventions supports these needs and challenges. For example, mobility hubs were found to, on average, provide more support to the needs and challenges than any other intervention while delivery robots was one of the lower performers.

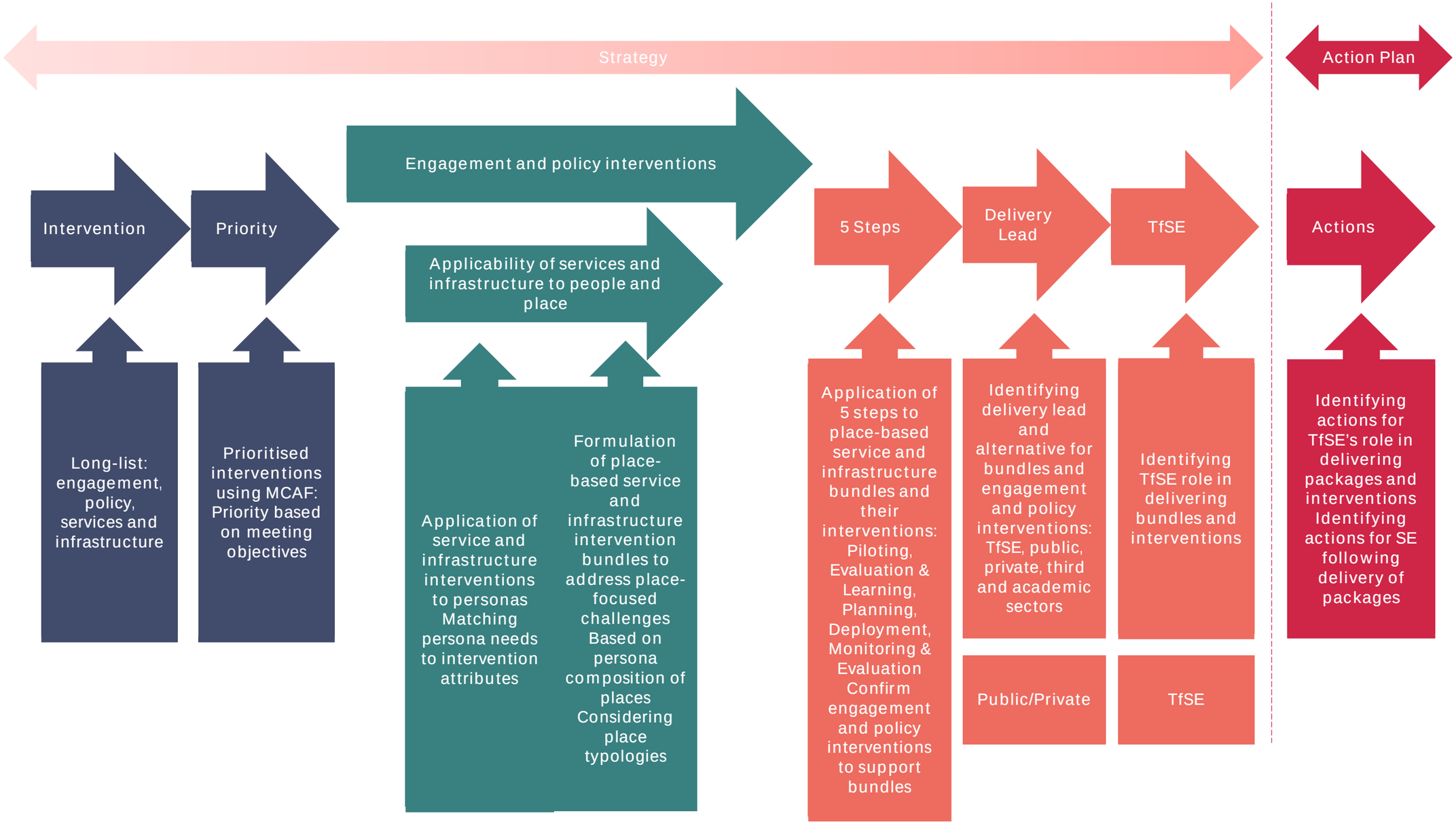
These first two steps were then brought together, alongside analysis of populations of each type of place in the South East, to assess how applicable each mode, service model and infrastructure intervention is to each place type. This provided an understanding of which interventions were most likely to support the needs of each type of place and their populations. Again, mobility hubs were found to provide more support to each place type than any other intervention while delivery robots performed relatively poorly.

An assessment was then undertaken of the deliverability of each intervention across MEH, urban and rural place types to combine understanding of applicability of interventions with a realistic view of barriers to delivery. The deliverability assessment considered the following for each intervention for each place type:

- Maturity;
- Ease of delivery;
- Existing infrastructure;
- Density of demand;
- Ability/willingness of commercial partners;
- Impact of statutory procedures;
- Public/political support; and
- Stakeholder support.

Looking again at mobility hubs and delivery robots, deliverability of both interventions varied across MEH, urban and rural place types, with deliverability in rural areas being relatively poor for both, but particularly so for delivery robots. Deliverability was greater in MEHs for both.

Figure 9 – Strategy development process



Future mobility bundles

Using the above analysis, indicative bundles of mode, service model and infrastructure interventions have been developed for four high level place-types – MEH, urban, rural and remote rural. These bundles provide indication of the most appropriate interventions for each place type by setting priorities for each intervention from very high priority to very low priority.

The bundles, the details of which are presented in Section 6, identify which modes, service models and infrastructure interventions are most likely to meet the needs of different population segments and the places in which they live and work, across the South East of England. They set the priorities and focus for action in these different places.

Using the examples from above, hubs are a 'very high' priority for all places (MEH, urban, rural and remote rural), while delivery robots are medium priority for MEHs and urban areas, low priority for rural settlements and very low priority for remote rural areas.

As there is significant variation between places within these place types, it is inappropriate to state in absolute terms that specific interventions should or should not be included in bundles for specific locations

Each local area will be able to use this information to develop and tailor locally specific bundles for their particular circumstances. The prioritisation of interventions within the indicative bundles for the four place types will enable local areas to focus on the higher priority interventions first.

In developing locally specific proposals, there is a range of variables, including the deliverability criteria identified previously, that need to be considered as they will have an influence on which interventions may be appropriate for a particular area (the following list is not exhaustive):

- The strength of the existing established mobility eco-system;
- Maturity of future mobility modes, service models and infrastructure currently in operation in the area;
- Ease of delivery within local conditions;
- Availability of existing infrastructure to support delivery;
- Density of demand for new interventions;
- Ability/willingness of commercial partners;
- Local issues that may affect statutory procedures e.g. environmental designations, local plans, etc;
- Local policy priorities including those focusing on economic, environmental and social outcomes;
- Local funding policies and constraints;
- Public/political support and priorities; and
- Stakeholder support and priorities.

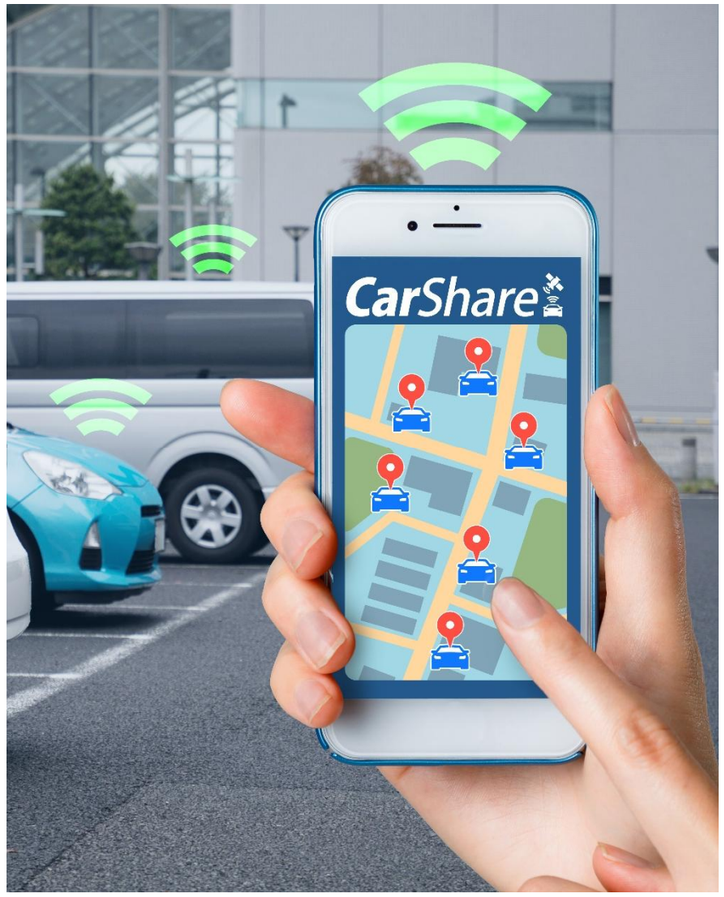
It should also be noted here that this assessment has been undertaken on the basis of the current conditions at the time writing (June 2021). With rapid changes in future mobility, the deliverability of some interventions may change significantly over coming months and years, and this assessment will need to be reviewed and updated accordingly, and, furthermore, will need to take into consideration any new modes, service models and infrastructure interventions that come forward in the future mobility area of focus.

Supporting interventions

The long list of interventions, following sifting through the MCAF process, contains a significant range of activities and it would be extremely difficult to deliver all at once. This strategy is therefore focused on the actions most necessary to deliver the place-based bundles and complementary interventions from the long list have been selected for inclusion based on both their MCAF scores and how they relate support the bundles.

Summary

The process set out in this section has enabled specific indicative bundles of future mobility interventions to be identified for four broad place types within the South East. The following section describes in more detail how these bundles can be applied and the impact they and supporting interventions may have.



Future mobility interventions

6. Future mobility Interventions

Introduction

The outcome of the analysis described in the previous section is four indicative place-based bundles of interventions. Each bundle provides a priority (from very low to very high) for interventions to be delivered in the MEHs, urban, rural and remote rural settlements.

The high and very high priority interventions may take precedence and typical bundles have been described below for each place type.

This section also presents a set of complementary interventions, focused on engagement and influencing, policy and facilitating infrastructure that could be delivered alongside the bundles to support the delivery of future mobility in the South East.

This section also demonstrates the benefits to meeting objectives of the interventions contained in the bundles.

Place-based bundles

Set out below are the individual indicative place-based bundles for each of the four high level place types: MEH, urban area, rural areas and remote rural areas.

For each area, the key high and very high priority interventions are highlighted along with a description of what a typical bundle may look like when applied to a specific settlement within the particular place type.

Table 8 sets out the indicative bundles for each place type and the priority interventions for each.

Table 8 – Place-based bundles

Intervention	MEH bundle	Urban bundle	Rural bundle	Remote rural bundle
Shared mobility - e-bike	H	M	L	L
Shared mobility - e-scooter	H	M	L	L
Shared mobility - P2W (powered two wheeler)	H	M	M	L
Shared mobility - peer to peer vehicle sharing	H	H	H	M
Shared mobility - ride-sharing platforms	H	H	H	M
Shared mobility - business to customer vehicle sharing (e.g. car club)	H	H	H	H
Shared mobility - ride-sourcing - 'on-demand private hire/taxi'	H	H	M	M
Shared mobility – digital demand responsive transport (DDRT)	H	H	VH	VH
Automated (and ultimately autonomous) road mass transit	L	L	L	VL
Automated (and ultimately autonomous) FMLM shuttles	L	L	L	VL
FMLM delivery robots / shuttles (land-based)	M	M	L	VL
Low level air (drones) - freight	L	L	M	M
Low level air (drones) - passenger	L	L	L	L
Shared mobility - e-cargo bike	H	H	L	L
Digital-as-a-mode communications / services	H	VH	VH	VH
Hubs (mobility / community asset / service)	VH	VH	VH	VH
MaaS platform (including mobility credits and gameification)	H	H	M	L
Digital kerbside management applications	L	L	L	VL
Consolidation centres (regional, urban, micro)	H	M	L	VL
Business to business freight capacity exchanges	H	H	M	M
Business to customer freight capacity exchanges	H	H	M	M
Flexible streetscape	H	M	L	VL
Road space reallocation to future mobility modes e.g. lanes, kerb space	H	M	L	VL
Hydrogen refuelling infrastructure (all modes)	M	M	L	L
EV charging infrastructure (all modes)	H	M	M	L

Major economic hubs (MEH)

Major Economic Hubs are urban centres with the highest population and employment densities in the South East. These locations tend to have the strongest transport networks in terms of the provision of mass transit and have higher levels of investment in sustainable transport. They are also locations where future mobility interventions tend to appear first, as a focus for private sector investment. Due to the scale of population, the markets for future mobility interventions tend to be larger and the infrastructure provision to support implementation tends to be stronger.

Based on the assessment, the following interventions scored high and very high in relation to a MEH place type:

- Hubs (Mobility / community asset / service);
- Digital-as-a-mode communications / services;
- MaaS Platform (including mobility credits and 'gameification');
- Shared mobility - e-bike;
- Shared mobility - e-scooter;
- Shared mobility - P2W (powered two-wheeler);
- Shared mobility - peer to peer vehicle sharing;
- Shared mobility - ride-sharing platforms;
- Shared mobility - business to customer vehicle sharing (e.g. car club);
- Shared mobility - ride-hailing - 'on-demand private hire/taxi';
- Shared mobility - e-cargo bike;
- Shared mobility - digital demand responsive transport (DDRT);
- Consolidation centres (regional, urban, micro);
- Business to business freight capacity exchanges;
- Business to customer freight capacity exchanges;
- Flexible streetscape;
- Road space reallocation to future mobility modes e.g. lanes, kerb space; and
- EV charging infrastructure (all modes).

A typical MEH bundle could include: Hubs (mobility / community asset / service) scored the highest and provide an excellent opportunity to bring various services together improving connections, collaboration, and public realm in MEHs. The hubs require integration of several services, which should exist in the area including public transport and shared mobility services like micromobility, DDRT, car clubs and ride-hailing. With the highest population densities in the Transport for the South East area, there is the greatest potential for private investment in the form of new business models such as shared cars and micromobility and it is expected those services will be available in MEHs and at the hubs. We may see an increasing number of people using shared cars and use of car clubs may be encouraged as part of the Government's policy and incentives. The popularity of micromobility including e-bikes, e-scooters, e-mopeds and other evolving vehicle types, is likely to increase in major economic hubs as urban users become more familiar with the micromobility offer.

Given the competing needs within the streetscape for both people and freight-based services a more flexible approach to street scape use would allow for road space reallocation in favour of existing and emerging modes as well as providing facilities for new freight solutions enabled by local consolidation centres.

Aggregation of all mobility services into a multi-modal travel planning app would be in the interest of the end user and MaaS platforms provide an opportunity to integrate a variety of the services in MEHs.

Electric vehicle infrastructure will be gradually deployed encouraging people to use EVs. EV rapid charging hubs will appear in MEHs encouraging an uptake of EVs.

automated (and ultimately autonomous) road mass transit and automated (and ultimately autonomous) first mile/last mile shuttles scored low in relation to other services as the AV technologies are still in early development phase. As innovations in vehicle automation evolve, it is likely that the first places to see autonomous vehicles in transport services are MEHs, due to higher potential levels of demand. In the future some of the MEHs may have a point-to-point (e.g. city to airport) autonomous services and AVs may be in use on public roads.

The following page presents a graphical impression of the MEH bundle and how this might affect Miguel, the MEH persona.

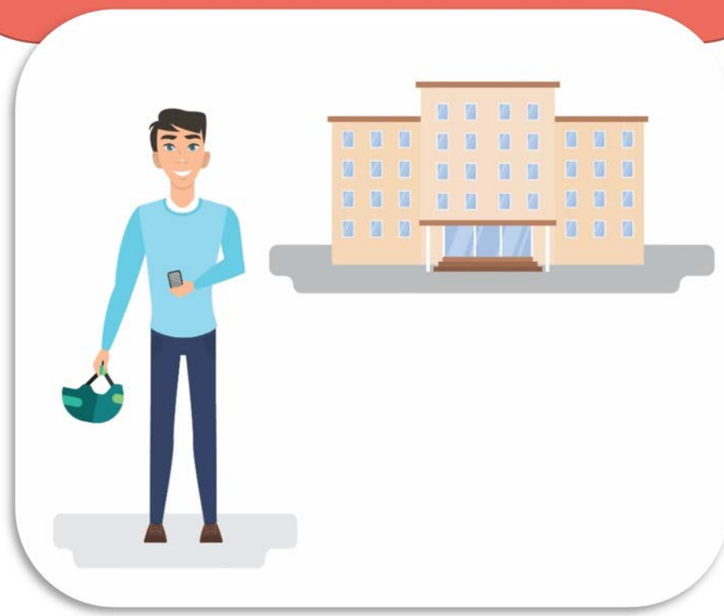
What are Miguel's pain points?

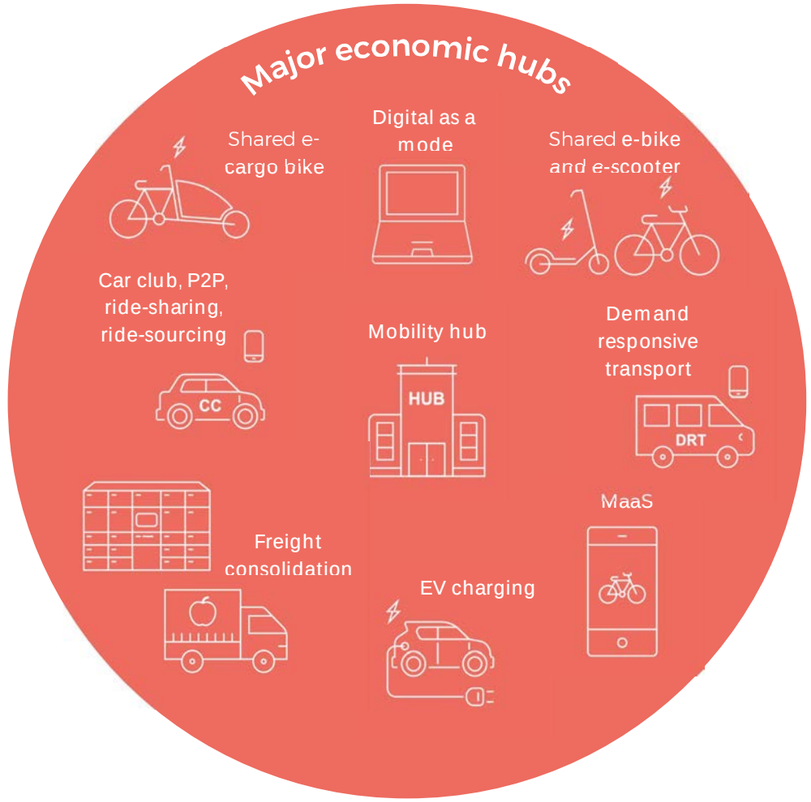
The main concerns that Miguel has when travelling are cost and reliability. As he likes to live in the moment, on demand transport is important to him. If Miguel has to use multiple transport modes, he wants it to be easy enough to change from one to the other.

Cost is a concern for Miguel. Although he works part time and is partly funded by his parents, as a student Miguel would rather spend his money on socialising and gigs than transport.

Miguel's transport choices are influenced by the impact he has on the environment, so he chooses to walk or cycle where possible. His flatmate's car is a very old and unreliable so he tries to avoid asking for lifts.

Security is a concern for Miguel, particularly after his previous bike was stolen due to lack of secure storage.





How does the bundle support Miguel?

Miguel now uses shared e-bikes and e-scooter for most of his journeys and this enables him to get to his classes quicker. He prefers to hire these as he is put off buying and securely storing an expensive e-bike.

Hiring an e-bike or e-scooter is made easy through the city's MaaS app and he has a pay-as-you-go account that helps him manage his spending. As he is such a frequent user, he has started to receive discounts for local shops. His flatmate has used a scrappage system to swap his old car for mobility credits and he now uses the bus. They now hire a car club vehicle together when they need to travel further

A local mobility hub has opened in Miguel's neighbourhood giving him quick access to his e-bikes, e-scooters and the car club. He has also started working in its co-working café and he sometimes uses the e-cargo bikes to deliver buffets to surrounding businesses offices. The community space in the hub has been used as a COVID-19 vaccination centre.

Urban settlements

The second tier of settlements in the South East area are the 'urban settlements' often providing supporting roles to the MEHs to which they are most closely related, or indeed, providing sources of workforce for London. The transport networks within the urban settlements, in terms of mass transit and sustainable transport are generally weaker than in the MEHs and they tend to lag behind the larger settlements in the delivery of future mobility. Reliance on the private car is consequently generally higher compared to the MEHs.

Based on the assessment, the following interventions scored high or very high in relation to the urban place type:

- Hubs (Mobility / community asset / service);
- Digital-as-a-Mode communications / services;
- MaaS Platform (including mobility credits and 'gameification');
- Shared mobility - peer to peer vehicle sharing;
- Shared mobility - ride-sharing platforms;
- Shared mobility - business to customer vehicle sharing (e.g. car club);
- Shared mobility - Ride-hailing - 'on-demand private hire/taxi';
- Shared mobility - e-cargo bike;
- Shared mobility – digital demand responsive transport (DDRT);
- Business to business freight capacity exchanges; and
- Business to customer freight capacity exchanges.

A typical bundle could include: Town centre hubs with local centre, neighbourhood and community hubs could provide a significant opportunity to stitch together the existing mobility network with new shared mobility alongside opportunities to do more activities locally. These could also support commercial entrants into smaller urban areas where they have previously focused on MEHs. Hubs could be combined with a MaaS platform to improve the user experience and encourage wider sustainable travel, bringing together the physical provision with improved systems for planning, paying for and monitoring transport.

The range of new and enhanced mobility services will widen the options available to all encouraging more sustainable travel choices and reducing reliance of single-occupancy car. Improved local freight choice through provision within hubs, e-cargo bikes and freight capacity exchanges may provide opportunities to generate a more diverse freight market and reduce negative impacts within the urban areas.

What are Bob and Jeanette's pain points?

The main concerns for Bob and Jeanette are cost and value for money. This is because running a car and parking is expensive but public transport costs can also mount up for a family of four.

The reliability of transport is a key consideration for Bob and Jeanette as they have to take the children to school and various after school activities. Travel information and timetabling can be confusing and the bus services don't always get the kids to their after-school activities on time.

The children are pressuring their parents to consider the environment. However, although the car is underutilised, Bob and Jeanette feel dependent on their car for some of their journeys.

How does the bundle support Bob and Jeanette?

Bob and Jeanette are now benefitting from a new app that has all of their transport needs in one place. They use this to travel to the children's football training and dance lessons, deciding between bus, car club or hire bikes depending on the venue and the weather.

After the car failed to start one Friday evening, they have turned to using supermarket home deliveries and also use the convenience store at the new mobility hub nearby where they access the bus stop, car club and hire bikes.

Bob's company is replacing his van with a new electric one and fitting a charger to his house. They have now decided to scrap their old car and not replace it meaning they can return half their driveway to garden.

Rural settlements

The Transport for the South East area has a variety of rural place types with different levels of accessibility and connectivity. Settlements in rural areas are generally reliant on car-based travel due to weaker public transport networks and limited infrastructure to support sustainable travel. Digital communications tend to be weaker in rural settlements, at least historically, leading to the benefits of e-commerce being slower to reach locations away from the main urban areas.

Based on the assessment, the following interventions scored high and very high in relation to a rural place type:

- Hubs (Mobility / community asset / service);
- Shared mobility – digital demand responsive (DDRT);
- Digital-as-a-mode communications / services;
- Shared mobility - peer to peer vehicle sharing;
- Shared mobility - ride-sharing platforms; and
- Shared mobility - business to customer vehicle sharing (e.g. car club).

A typical bundle could include: Rural hubs (mobility / community asset / service) could focus on the needs of the residents and provide first/last mile connectivity, a shop and a café, co-working & pop-up spaces and rapid electric vehicle charging. Additionally, provision for (say) a mobile health centre may visit the hub regularly to serve the residents.

DDRT services are expected to be trialed to test their feasibility in rural place types connecting rural settlements with local urban areas. It is expected that a focus will be on first/last mile connectivity e.g. to the rail station and some of the villages may implement community run shared car clubs.

Automated (and ultimately autonomous) road mass transit and automated (and ultimately autonomous) FMLM shuttles scored low in relation to other services as the CAV technologies are still in early development phase. When CAVs are introduced, the areas may see adoption of shared CAV services for commute to nearby urban settlements and first/last mile connectivity. DDRT vehicles can become autonomous and shared pods may be seen on the roads.

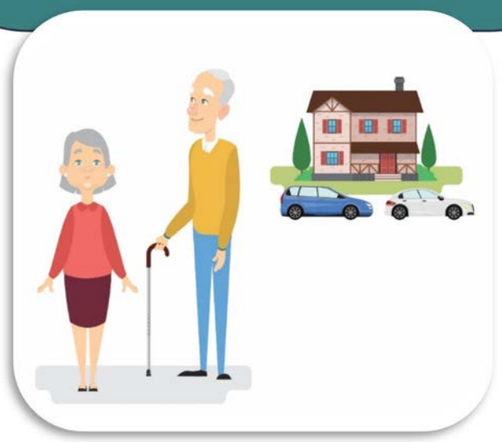
What are Susan and Graham's pain points?

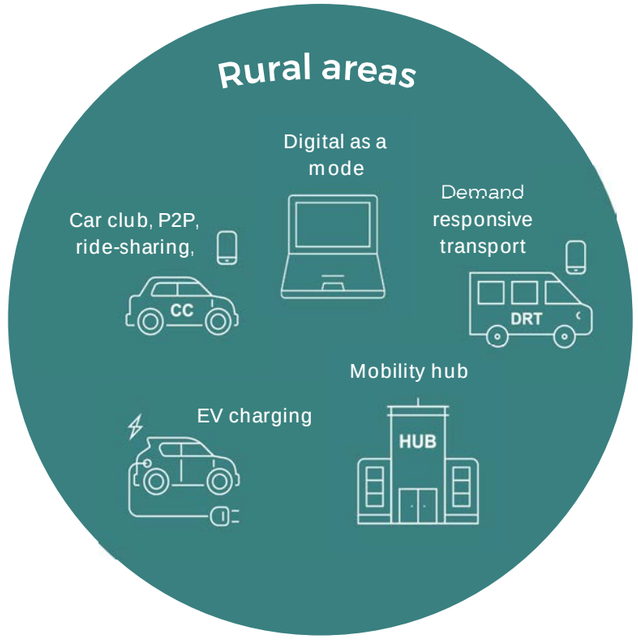
The main concerns for Susan are around her dependence on having a car to make her journeys. Susan requires disabled parking bays at her destination that are conveniently located but often they are full.

Susan is worried about the future if she becomes unable to drive as she is the designated driver for her husband and she also wouldn't be able to look after her grandchildren any more. They would feel very isolated in the village which lacks most of the facilities they go to the town for.

Susan has tried to use the bus but she usually has to change which she finds physically difficult, especially when travelling with her husband.

Both Susan and her husband struggle with technology and they don't like using the smartphone their daughter bought them just in case they over pay or break it.





How does the bundle support Susan and Graham?

With initial help from her grandchildren, Susan has started to use video-conferencing to speak to them every few days. She is also becoming more confident in using her smartphone to access transport information. She has realised that some of the buses go direct to the market town if she travels as the right time.

Her village has set up a community hub and has opened a shop, hairdresser and community café. Susan has started volunteering there and gets her hair done each week. The hub has opened a ride-sharing group and Susan now gets lifts with new friends.

Susan is planning to use a new Demand Responsive Transport service to the hospital for her and her husband's appointments as she is finding it increasingly stressful to drive into town and find parking. If they like it, Susan is even considering getting rid of their cars before they have to give up driving – she would prefer to make that choice herself.

Remote rural

These are the least connected locations in the region and provide some of the most challenging environments within which to deliver future mobility solutions. Car travel dominates and mass transit is generally very limited or not available at all in some locations. These areas lag some way behind in seeing future mobility innovations, however, opportunities do exist, and some interventions may be particularly suited to the dispersed nature of settlements and populations.

The high and very high scoring interventions included:

- Hubs (mobility / community asset / service);
- Digital-as-a-mode communications / services;
- Shared mobility - digital demand responsive transport (DDRT); and
- Shared mobility - business to customer vehicle sharing (e.g. car club).

A typical bundle could include: Small rural hubs combining local community and commercial functions, to reduce the need to travel to larger centres, with community focused provision of DDRT and car club services linking into trunk haul mass transit systems.

Central to accessing services will be improvements to digital communications enabling more activities to be undertaken remotely and reducing the need to travel to only those occasions when physical access really is needed.

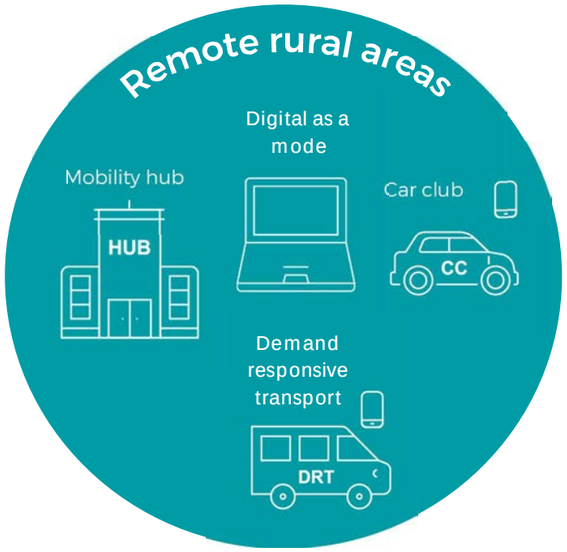
Whilst not a high priority at present, there is also potential for low level air to have a greater role in the remote rural mobility ecosystem where the longer distances and more limited road network may give advantages to the more direct routes enabled by aerial systems.

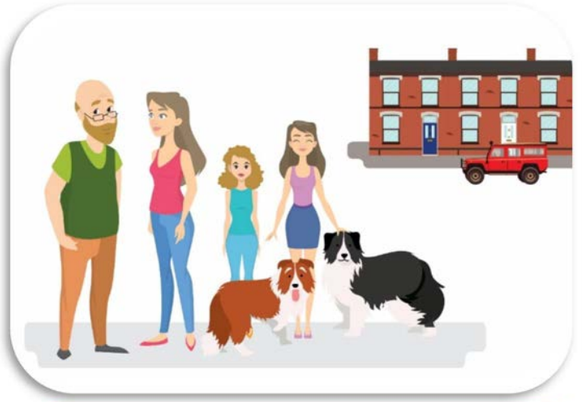
What are Mike's pain points?

Mike's main concerns are around the reliability of his vehicles due to their age. Mike may need to replace some of his vehicles but he is concerned with the cost of doing this. Mike is also concerned with how suitable newer vehicles are, as he needs specific vehicles when using them to work on the farm.

Mike is reliant on his vehicles as he not only uses them on the farm but due to the remote location of where he lives, he has few alternatives to driving for most or all of his journeys as key services are not in the local area.

Mike's teenage children want to access services digitally, but the internet is too slow for them.





How does the bundle support Mike and his family?

Mike is planning on selling one of his vehicles as he and his children are starting to use a new Demand Responsive Transport service. His two children now use the service to go to sports training

Mike is reliant on on-street parking for one of his cars so by selling it he is hoping that the recurring issue with parking and the neighbours will be resolved.

Improved digital connectivity has allowed for Mike and his family to start accessing services, such as doctor's appointments, online.

The hospital have installed diagnostic equipment in Mikes home which means his daughters health condition can be monitored remotely.

Now they don't have to travel to the nearest market town to do the big shop and they get their groceries delivered.

Mike has started selling some produce online as well as some of his wife's crafts, using the parcel locker in the village to send packages. They have now made enough money to buy an e-bike and the family share it for making local journeys, meaning that they don't miss the car they've sold.

Complementary interventions

Alongside the bundles outlined above, there is a range of complementary interventions which could be delivered to support both the delivery of the bundles of interventions and future mobility more broadly across the South East.

Engagement and influencing

- South East future mobility forum - Transport for the South East to lead a future mobility forum for the South East to bring together key public and private sector players from across transport and adjacent sectors. The overarching future mobility forum will inform and guide tasks and discussion within each mode/industry specific forum -such as tasks relating to the seven future mobility changes.
- Shared learning hub - a future mobility shared learning hub, a common virtual on-line platform for information, learning and best practice relating to future mobility. Specific evidence should be added to this through undertaking a study to understand public and stakeholder behaviour, perceptions and acceptability of the key changes of future mobility.
- Future of rural mobility forum – A Transport for the South East-led forum supporting the overall future mobility forum, focusing specifically on supporting the delivery of future mobility in rural and remote rural locations.
- Future mobility integration into major sites and assets - Engagement should be commenced between the public sector and Influential property portfolio and major asset owners to promote the trialing and incorporation of new modes and models across their estates. Key employers in the South East should also be engaged with to promote and facilitate the use of future mobility models to commute to work (e.g. ride sharing platforms, remote working).
- Ties with national research bodies - Develop strong ties with DfT, Innovate UK and other research bodies so that research, trials and early stage deployments consider the specific needs of the networks and customers in the Transport for the South East area.
- Future Transport Zone engagement - A further key step will be for Transport for the South East to continue working with Solent Transport in supporting its Solent Future Transport Zone (FTZ) programme, one of only four FTZs across the country. A common stakeholder engagement and communications plan will be developed to support continuous knowledge sharing with all local authorities in the South East area on the outcomes and learning from the programme. If successful, Transport for the South East will support further roll out of FTZs in the South East.

Policy

- Local authority behavioural change - Local authorities will work together to formulate guidance to develop and implement a range of policy and funding tools to build in future mobility into their behavioural change and demand management programmes.
- Hubs strategy - Develop a Hubs Strategy for the Transport for the South East area with associated guidance and toolkit.
- EV policy integration - Encourage partner local authorities to incorporate support for EVs into a range of policies e.g. Traffic regulation orders, parking tariffs, residential parking zones and charges, EV only infrastructure, green number plates etc. Ensure effective policy monitoring and evaluation is undertaken.
- Integration of transport, energy and digital communications strategy – Transport for the South East setting a vision and strategy for interaction and integration of transport, energy and digital communications across the South East with local authorities leading on the integration within their policies.
- Future mobility integration into economic, spatial and transport policy - Undertake engagement with local authorities and their economic, planning and transport teams in order to integrate future mobility into related policy.
- Future propulsion strategy - The strategy, covering electrified propulsion (both electric and hydrogen) should define the outcomes which Transport for the South East are aiming to achieve (with the focus on customers), set out priorities and a high-level plan to achieve them. This could cover, amongst other matters, the strategy for delivering a common approach to charging and fueling infrastructure across the South East.
- First mile/last mile strategy – Develop a first mile/last mile strategy for the Transport for the South East area (inclusive of micro-mobility and active travel modes). links between strategic transport and local networks.
- Public sector service digitisation - Local authorities to lead on the development of standards for digitisation of public sector services across the South East.

Facilitating infrastructure

- Local electricity grid upgrades - Engage with central Government to provide funding to support local grid upgrades and implementation of EV infrastructure in the area.
- Heavy duty use case electrification infrastructure - Local authority-led engagement to secure funding to support infrastructure for electrified propulsion in heavy duty uses cases (e.g. freight and mass transit).

- Urban and rural digital communication networks – Utility companies working with partners to deliver fit for purpose digital connectivity and broadband across the South East to meet wider Transport for the South East objectives.

Area studies

The future mobility strategy has been developed alongside Transport for the South East's five area studies and the interventions in this strategy have been fed directly into the development of options for intervention in the area studies.

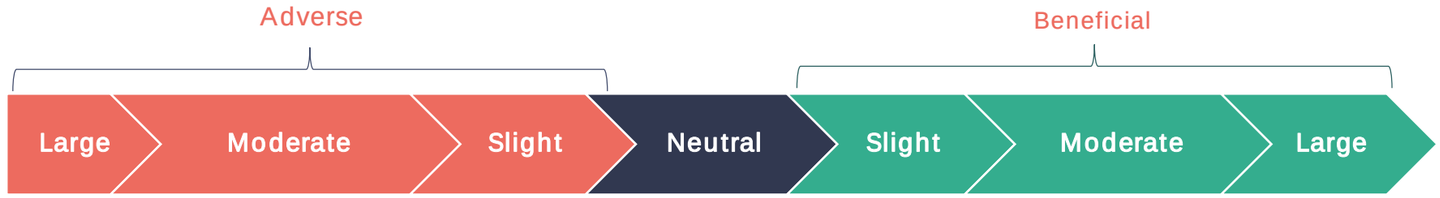
Benefits and meeting strategy objectives

The interventions presented within this section of the strategy provide a suite of tools to deliver the future of mobility across the South East. The multi-faceted nature of the interventions not only enables the full range of key objectives and priorities to be supported but also for the delivery mix to be flexed to meet changing demands and conditions within different places across the South East.

The bundles described in this section have been developed on the basis of the needs of people, the combination of people's needs in different places, and how those places influence the deliverability of interventions. However, the development of this strategy has included an assessment of the extent to which the suite of interventions supports the objectives of the strategy and, therefore, the overall vision. Through the development of the MCAF, each intervention was assessed, at an indicative level, against the following criteria:

- Suitability assessment: The extent to which each intervention may support the TfSE transport strategy vision statement, strategic goals and key principles as well as the future mobility strategy objectives

Figure 10 – Multi-criteria assessment framework scoring



- Acceptability assessment: The extent to which each intervention may support the TfSE Transport Strategy Objectives
- Future of Mobility: Urban Strategy (FoM:US) assessment: The extent to which interventions may support the nine key principles.
- Feasibility assessment: The extent of feasibility risks facing each intervention.

The interventions were assessed and scored on a standard seven-point scale from large adverse to large. The analysis is contained in the separate supporting technical report.

Table 9 presents outcome of the MCAF assessment in terms of performance against future mobility strategy objectives:

- Future mobility will play a central role in helping decarbonise the transport eco-system through the provision of electro-mobility modes and services to help reduce dependency upon the sole occupancy, private car irrespective of propulsion type.
- Active travel will be the first choice for local journeys, for those who are able, supporting better air quality and the improved wellbeing of communities.
- Zero emission mass transit will be at the centre of the mobility ecosystem, reducing car dependency and ownership.
- The connectivity, capacity, efficiency, reliability and resilience of the mobility ecosystem will be optimised, making best use of existing assets and investments in services and infrastructure.
- Future mobility will be integrated with the established passenger and freight/logistics transportation networks, delivering safe, seamless journeys and making planning, using and paying for mobility simpler and easier.
- Future mobility will be integrated with spatial and economic planning, making high quality people-focused places, securing funding, supporting investment in the region's economy and targeting investment where it is needed most.
- The mobility eco-system will be people-centric and accessible to all, supporting the lives of everyone through integrating the needs of communities and urban and rural places, with policy, modes, services and infrastructure.
- Fit for purpose digital connectivity will be universal, improving access to services and reducing the need to travel.

The table presents the overall assessment of the level of support that each of the mode, service model and infrastructure intervention may provide to objectives and the scale of risk.

The table clearly shows that there are a number of high performing interventions, namely: shared mobility e-bikes and e-scooters, and hubs. Digital-as-a-mode is also high performing in general and had significant number of large beneficial scores against

Table 9 – Contribution to objectives by interventions

Bundle Component	Suitability Assessment	Acceptability Assessment	FoM:US Assessment	Feasibility Risk	Overall Assessment
Shared mobility - e-bike	Large Beneficial	Moderate Beneficial	Large Beneficial	Moderate Risk	Moderate Beneficial
Shared mobility - e-scooter	Large Beneficial	Moderate Beneficial	Large Beneficial	Moderate Risk	Moderate Beneficial
Shared mobility - P2W (powered two wheeler)	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Neutral	Slight Beneficial
Shared mobility - peer to peer vehicle sharing	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Risk	Slight Beneficial
Shared mobility - ride-sharing platforms	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
Shared mobility - business to customer vehicle sharing (e.g. car club)	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Risk	Slight Beneficial
Shared mobility - ride-sourcing - 'on-demand private hire/taxi'	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
Shared mobility - digital demand responsive transport (DDRT)	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
Automated (and ultimately autonomous) road mass transit	Moderate Beneficial	Moderate Beneficial	Slight Beneficial	Slight Risk	Moderate Beneficial
Automated (and ultimately autonomous) FMLM shuttles	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Moderate Risk	Moderate Beneficial
FMLM delivery robots / shuttles (land-based)	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Moderate Risk	Slight Beneficial
Low level air (drones) - freight	Slight Beneficial	Slight Beneficial	Slight Beneficial	Moderate Risk	Slight Beneficial
Low level air (drones) - passenger	Slight Beneficial	Slight Beneficial	Slight Beneficial	Moderate Risk	Slight Beneficial
Shared mobility - e-cargo bike	Large Beneficial	Moderate Beneficial	Large Beneficial	Moderate Risk	Moderate Beneficial
Digital-as-a-mode communications / services	Large Beneficial	Moderate Beneficial	Moderate Beneficial	Neutral	Moderate Beneficial
Hubs (mobility / community asset / service)	Large Beneficial	Moderate Beneficial	Large Beneficial	Moderate Risk	Large Beneficial
MaaS platform (including mobility credits and gameification)	Moderate Beneficial	Moderate Beneficial	Large Beneficial	Slight Risk	Moderate Beneficial
Digital kerbside management applications	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Risk	Moderate Beneficial
Consolidation centres (regional, urban, micro)	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Moderate Risk	Moderate Beneficial
Business to business freight capacity exchanges	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
Business to customer freight capacity exchanges	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
Flexible streetscape	Moderate Beneficial	Slight Beneficial	Moderate Beneficial	Moderate Risk	Moderate Beneficial
Road space reallocation to future mobility modes e.g. lanes, kerb space	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Risk	Slight Beneficial
Hydrogen refuelling infrastructure (all modes)	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Slight Risk	Moderate Beneficial
EV charging infrastructure (all modes)	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Risk	Moderate Beneficial

individual objectives, however, the average was reduced by low impact on zero emission mass transit and active travel.

There are also a significant number of interventions that provide moderate benefits to the objectives as a whole. These interventions tend to have a range of impacts on individual objectives with most having a combination of large, moderate, slight and neutral impacts. In the case of some of the shared modes, the support they provide to objectives, on average, is somewhat reduced by the potential to have negative impacts on active travel as they may provide competition for some journeys.

An assessment has also been made of how well each bundle will support the nine objectives. Across each of the four bundles. they provide moderate benefits but with slightly higher average benefits for the MEHs and urban areas compared to the rural and remote rural areas.

With the bundles containing more interventions in the MEHs and urban areas, there is potential for benefits to be greater and they are likely to delivery greater scales of benefits due to the larger populations and levels of movement in those areas.

Whilst the benefits may be moderate in aggregate, future mobility interventions need to form part of the wider transport strategy and area studies. Through integration with broader packages of intervention, they should work as part of the whole mobility eco-system delivering wider and potentially enhanced benefits alongside more established transport enhancements. Together, both future mobility and other interventions will focus on meeting some of the greatest challenges mobility and transport face including reducing sole-occupancy car travel and meeting net zero targets.

Summary

The strategy contains four bundles of mode, service model and infrastructure interventions focused on different types of place in the South East, supported by a range of complementary interventions. These bundles are indicative and provide a basis upon which local areas can develop their own proposals to bring forward packages future mobility projects.

These are interventions are being integrated into wider policy and strategy at a sub-national level including through the area studies. At a local level, future mobility, including these interventions, need to be woven into policy and delivery to help local authorities achieve their own objectives and support the wider roll out of future mobility across the South East.

Shaping the future of mobility

7. Shaping the future of mobility

Overview

This is a strategy for the South East as a whole to deliver. Whilst some interventions will be driven by Transport for the South East, this strategy is also a call for action by the sub-national transport body to its partners. That call is to the public, private, third and academic sectors, to join together to drive the delivery of the proposals set out below. The strategy cannot be delivered by the public sector alone; it will take expertise, experience, capability and investment from across sectors and industries to make sure the South East is leading the way.

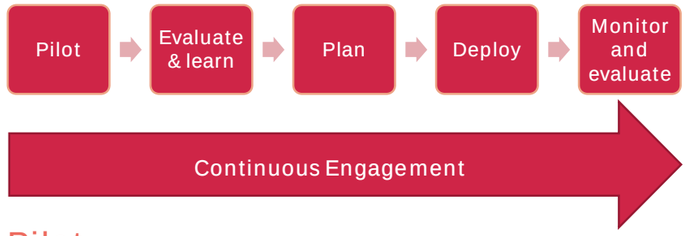
Action-based strategy

This is an action-based strategy setting out what is required across the South East to deliver and embed the future of mobility into the area and meet the aim of delivering a globally leading sustainable mobility eco-system and meet the challenge of net zero.

The strategy presents an integrated approach focusing on delivering early through pilots and testing and using evaluation and learning to shape future plans for wider deployment. Monitoring and evaluation at each stage of piloting, planning and deploying will be vital to continue facilitating learning and development. Continuous engagement between partners and stakeholders will be needed throughout all stages of delivery.

It should be noted that this framework is not intended to stifle innovation or the rapid adoption of solutions. But the same principles would apply for new deployments say a DDRT service in any given place, we would seek to maximise learning for all our partners through a monitoring and evaluation programme even if that had not gone through the earlier pilot stages.

Figure 11 – Five stages of future mobility delivery



Pilot

The trialing of emerging future mobility modes, services and infrastructure will be vital in developing solutions that meet Transport for the South East objectives and meet the needs of people in their communities across the South East.

Whilst many of the partners across the area already take part in trialing and piloting, there is a significant opportunity to co-ordinate and integrate these activities across the South East. An area-wide approach to piloting could enable resources to be pooled, programmes to be aligned, processes standardised and learning more quickly gained and disseminated. This may also enable funding activity to be co-ordinated and for risks to be shared.

As piloting can present operational, financial and reputational risks to those involved, an agreement across the South East could be made on the distribution of piloting activity across the area. Authorities could agree to take roles to pilot particular interventions or testing for specific use cases, agreeing to openly share learning, and helping to ensure that the burden of risk does not fall too heavily on any one authority.

A piloting co-ordination group should be set up to provide oversight of piloting across the South East and all of this activity could be supported by the development of best practice guidance for piloting and evaluation of future mobility.

Transport for the South East will support and encourage more partner authorities to participate in trials of future mobility models across different geographies and use cases. Alongside this, there needs to be greater public sector engagement with private sector partners to develop relationships and facilitate pilots of new mode, service and infrastructure propositions.

In considering piloting, there could be two approaches applied:

- Innovations that can be trialed within the 'live' mobility eco-system under normal, or near normal, operating conditions.
- Innovations that require 'sandbox' environments where new modes, services or infrastructure need to be trialed in a controlled environment. A term taken from Information Technology testing, sandboxes are sites or areas, either physical or digital, that provide piloting and trialing with defined environments where testing can be undertaken in a safe and controlled manner, but which replicate, or are, real world situations.

Our aim is for the South East to become an exemplar in future mobility piloting through policies, support and delivery which other areas will look to and replicate.

Across the South East, public sector partners should identify areas of their operations where they can offer 'live eco-system' piloting environments, focusing on specific strategic or operational challenges they face across different mobility use cases. This should be co-ordinated at the pan-South East level to

ensure that there is a consistency of approach and a variation in offer.

Partners and stakeholders, across the public, private and academic sectors should work together to identify potential piloting 'sandbox' locations across the area. Such sites or areas, both physical or digital, provide defined environments where trials can be undertaken in a safe and controlled manner, but which replicate, or are, real world situations. The Solent Future Transport Zone, part of DfT's £90m investment in Future Transport / Mobility, is the largest such example in the South East and represents a unique opportunity to not only pilot interventions but to accelerate learning for the benefit of all partners.

Our aim is to build on the Solent FTZ and for the South East to become a world leading testbed for future mobility interventions and share lessons learnt from pilot schemes undertaken across the South East area.

Evaluate and learn

To support evaluation of future mobility trials and the rapid dissemination of learning, a piloting monitoring and evaluation framework should be developed. This will provide a light-touch version of a more detailed strategy framework that is not burdensome and is focused on validating expected outcomes rather than monitoring in detail all elements of the delivery and trialing process.

Our aim is for early deployment and piloting to help shape future plans and policies leading to the successful wide scale deployment of future mobility across the South East.

Plan

The interaction between mobility and the people and places of the South East is central to shaping our economy and communities. The global trends and technology disruptions that are the focus of future mobility will drive changes that our economic, spatial and transport policies will need to face over the coming decades. Therefore, local policymakers should integrate future mobility into their plans and strategies beyond transport.

The learning from pilots and trials as well as from the monitoring and evaluation of wider deployment, both within the South East and elsewhere, will help to shape planning and new policy.

Deploy

Whether through pilots and trials or delivery of further developed and proven systems, it is the deployment of future mobility into the live mobility eco-system where the impact of future mobility will be seen the most.

Future mobility is not simply focused on new modes of travel but also the services through which they are accessed, and the infrastructure and dependencies necessary to deliver them.

Table 10 overleaf provides an indication where each of the above modes, service models, infrastructure interventions contained in the bundles are presently in the five stages of future mobility delivery within the South East, for the four place types (MEH, urban, rural and remote rural areas) and more widely across the UK.

In some cases, the table indicates that the interventions may be in more than one stage of delivery, reflecting where some interventions cover a cross-section of modes or services at different stages of development, the table also reflects the choice that partners have in whether to pilot or go straight to deployment. Mobility hubs for example are being trialed in the Solent Transport area but other authorities could decide to deploy hubs or hub principles, without piloting as part of projects to modernise existing transport interchanges.

This table indicates where partners could independently lead on developing specific interventions, however, taking a pan-South East approach there may be opportunities to improve deployment. For example, a collective approach to commissioning and procurement, and learning from best practice, could potentially enable economies of scale to deliver savings, consistency and interoperability.

Our aim is for future mobility modes, services models and infrastructure to be deployed across the South East meeting the specific needs each place and community.

Table 10 – Current position of interventions in the five stages of delivery

Intervention	Delivery Stage Transport for the South East (2021)				Delivery Stage - national position (2021)				
	MEH	Urban	Rural	Remote Rural	Pilot	Evaluate & Learn	Plan	Deploy	Monitoring & Evaluation
	Stage	Stage	Stage	Stage					
Shared mobility - e-bike	Deploy	Deploy	N/A	N/A					
Shared mobility - e-scooter	M&E	M&E	N/A	N/A					
Shared mobility - P2W (powered two-wheeler)	Pilot	N/A	N/A	N/A					
Shared mobility - peer to peer vehicle sharing	Deploy	Deploy	N/A	N/A					
Shared mobility - ride-sharing platforms	Deploy	Deploy	N/A	N/A					
Shared mobility - business to customer vehicle sharing (e.g. car club)	M&E	M&E	N/A	N/A					
Shared mobility - ride-hailing - 'on-demand private hire/taxi'	M&E	M&E	Deploy	Deploy					
Shared mobility – digital demand responsive transport (DDRT)	Deploy	Deploy	Plan	Plan					
Automated (and ultimately autonomous) road mass transit	Plan	N/A	N/A	N/A					
Automated (and ultimately autonomous) FMLM shuttles	N/A	N/A	N/A	N/A					
FM/LM delivery robots / shuttles (land-based)	N/A	N/A	N/A	N/A					
Low level air (drones) - freight	Plan	Plan	Plan	N/A					
Low level air (drones) - passenger	N/A	N/A	N/A	N/A					
Shared mobility - e-cargo bike	Plan	N/A	N/A	N/A					
Digital-as-a-mode communications / services	M&E	M&E	M&E	M&E					
Hubs (mobility / community asset / service)	Plan	Plan	N/A	N/A					
MaaS platform (including mobility credits and gameification)	Plan	Plan	N/A	N/A					
Digital kerbside management applications	Plan	Plan	N/A	N/A					
Consolidation centres (regional, urban, micro)	Plan	Plan	N/A	N/A					
Business to business freight capacity exchanges	N/A	N/A	N/A	N/A					
Business to customer freight capacity exchanges	N/A	N/A	N/A	N/A					
Flexible streetscape	Deploy	Deploy	N/A	N/A					
Road space reallocation to future mobility modes e.g. lanes, kerb space	N/A	N/A	N/A	N/A					
Hydrogen refuelling infrastructure (all modes)	Deploy	Deploy	N/A	N/A					
EV charging infrastructure (all modes)	M&E	M&E	M&E	N/A					

Monitor and evaluate

This strategy will be supported by a high-level Monitoring and Evaluation Framework to lead the assessment of the strategy's delivery and its resulting impacts across the range of interventions. The framework merges contemporary and more established approaches to evaluation to focus on the wider environmental, economic, social objectives and outcomes of the strategy as well as technical delivery of interventions.

Our aim is to actively learn from interventions as they are piloted and deployed across the South East, to understand what leads to success and to share those learnings widely for the benefit of partners in all sectors.

Engagement

Leading engagement

Transport for the South East will work collaboratively with stakeholders across sectors and industries through a number of topics focused forums to steer the delivery of the strategy across a range of specialist areas. Through the development of this strategy, a Future Mobility Steering Group has been convened and this will form the first of the forums. The number of topic-focused forums should be limited to ensure that they do not become burdensome with those focusing on rural mobility being higher priority.

The forums will be:

- Mechanisms for developing close and collaborative relationships across public and private sector.
- Mechanisms through which to secure funding.
- Mechanisms for Transport for the South East to embed and promote a people, place, activity outcomes focus.
- Mechanisms through which to co-ordinate monitoring and evaluation methodologies.
- Platforms for knowledge sharing.
- Platforms for encouraging Business as Usual.
- Platforms for encouraging innovation & enabling the conditions for success.
- Actively working to remove industry blockers.

Our aim is for future mobility to become a natural part of all our transport conversations and that a more integrated mobility eco-system is delivered through strong and enduring cross-sectoral partnerships.

Summary

This section has set out an overall approach to delivering future mobility in the South East providing a process of five key steps supported by ongoing engagement. This process is not intended to stifle independent innovation but to provide a framework for partners and stakeholders through which they can engage and co-operate in the delivery of new modes, service models and infrastructure. A further set of interventions have been identified to provide backing to the five steps and guide and support those who will deliver future mobility interventions.

Delivering the future of mobility

8. Delivering the future of mobility

Action-based strategy

This strategy sets out Transport for the South East's approach to supporting the delivery of future mobility across the South East of England. The support provided by Transport for the South East will be in the form of engagement and influencing, developing policy and strategy and working with partners and stakeholders to deliver and embed the new modes, services and infrastructure into the mobility eco-system and making them business as usual. The strategy sets out the actions that Transport for the South East believes are necessary to ensure that the area is at the forefront of future mobility and delivers the transformational change needed to achieve ambitious environmental, economic and societal objectives.

This is an action-based strategy, not simply setting out what Transport for the South East believes the interventions should be but identifying what Transport for the South East will do itself and with its partners and stakeholders.

This strategy is supported by a Strategic Plan incorporating an action plan and monitoring and evaluation framework which provide more detail on how the strategy will be delivered, by whom, and how its delivery will be monitored.

In developing this strategy, Transport for the South East recognises that leadership in future mobility is not only provided by central and sub-national policy. Local authorities, a wide range of industrial sectors, academia and private finance all play a role in delivering change in mobility and the modes, service models and infrastructure that facilitate it.

The Figure 12 overleaf provides a summary system map highlighting the relationships between different parts of the strategy.

Roles and responsibilities

Whilst the strategic plan sets out in more detail how the strategy will be delivered, a summary is provided here of the broad roles and responsibilities required.

The interventions and actions identified in this strategy cannot be delivered by Transport for the South East alone as there are many organisations with stakes in how mobility evolves to meet the coming changes.

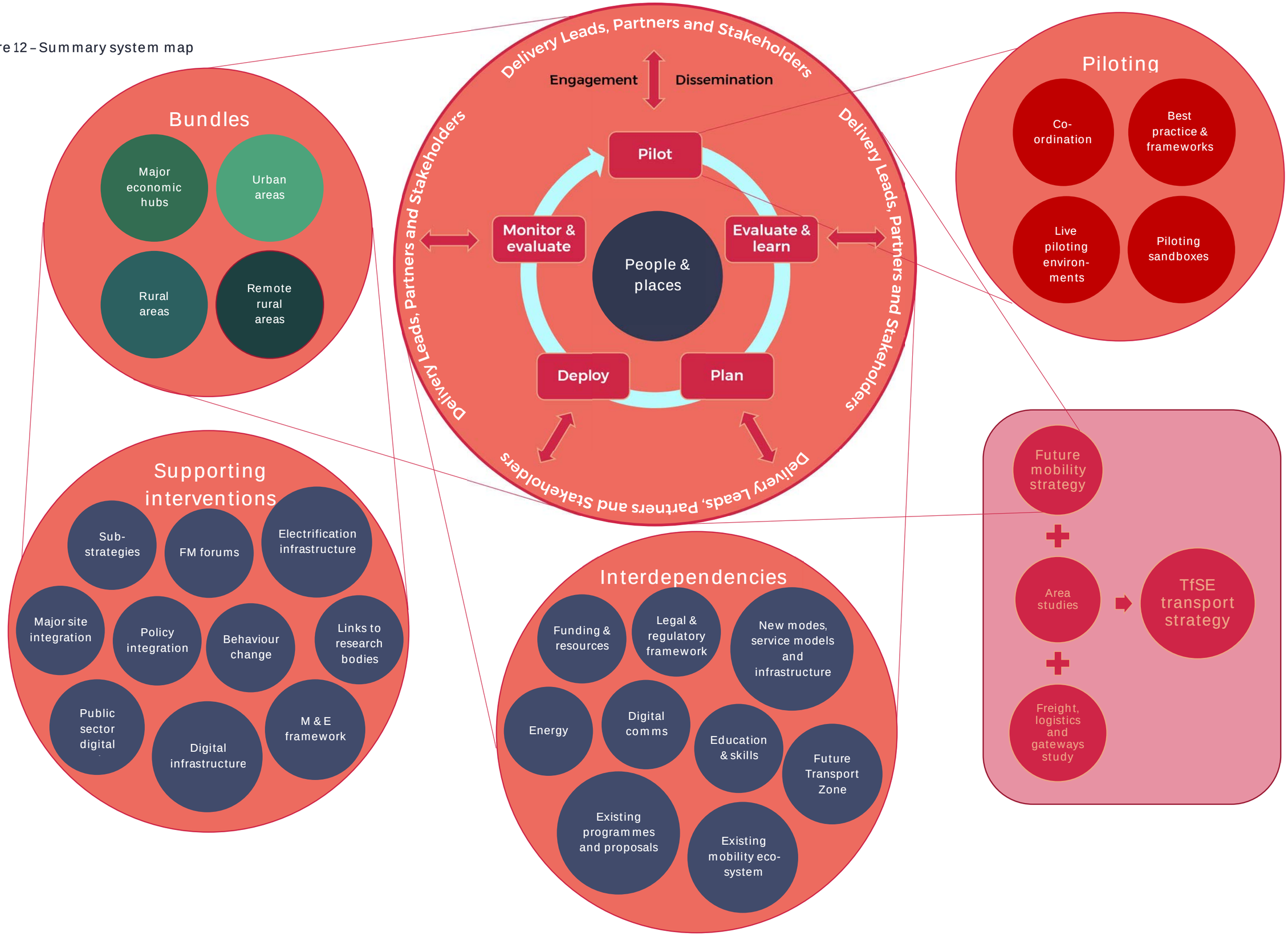
However, Transport for the South East should have specific roles and responsibilities in delivering this strategy: and may need appropriate resources to be allocated to this specific agenda.

- Setting the policy framework and more detailed policies to develop future mobility in the South East.
- Engaging with central government on national policy, funding and governance in relation to future mobility.
- Co-ordinating future mobility policy and practice with the other Sub-national Transport Bodies.
- Advise, guiding, coordinating and working in partnership with the South East's constituent authorities to develop and embed future mobility across the area and support the delivery of associated policy, services and infrastructure.
- Monitoring and evaluating the development of future mobility in the South East and co-ordinate and disseminate learning and evidence.
- Engaging and working with the full range of partners and stakeholders with roles in delivering future mobility within the South East area to support the co-ordination of delivery.
- Identifying what, if any, other future mobility-related activities should come under the remit of Transport for the South East and make proposals accordingly to central government.

However, this strategic plan has also identified in more detail the role that Transport for the South East could perform in delivering specific interventions under this strategy.

- Leading the development of future mobility engagement through forums and working groups;
- Leading the delivery of individual interventions;
- Act as partners and stakeholders in future mobility interventions led by other organisations;
- Working with stakeholders to encourage them to fulfil their roles in delivering the strategy and future mobility more widely;
- Working with stakeholders to ensure there is best practice, consistency, sharing of resources and wider partnering in delivering future mobility;
- Working with stakeholders to build future mobility and integration of mobility, energy and digital communications into their policies and practices;
- Working with stakeholders to support the delivery of the infrastructure necessary for future mobility;
- Developing guidance and tools to support the delivery of future mobility interventions, pilots and monitoring;
- Developing more detailed strategies for specific subject areas (e.g. hubs and electrified mobility);
- Leading the development of tools through which future mobility knowledge, understanding and skills can be increased (e.g. the shared knowledge hub);
- Engaging with stakeholders to make the case for funding future mobility; and
- Developing monitoring and evaluation frameworks.

Figure 12 – Summary system map



Partners and stakeholders

Across future mobility, the range of stakeholder sectors and organisations that will partner Transport for the South East to deliver this strategy is substantial and will include, but not be limited to:

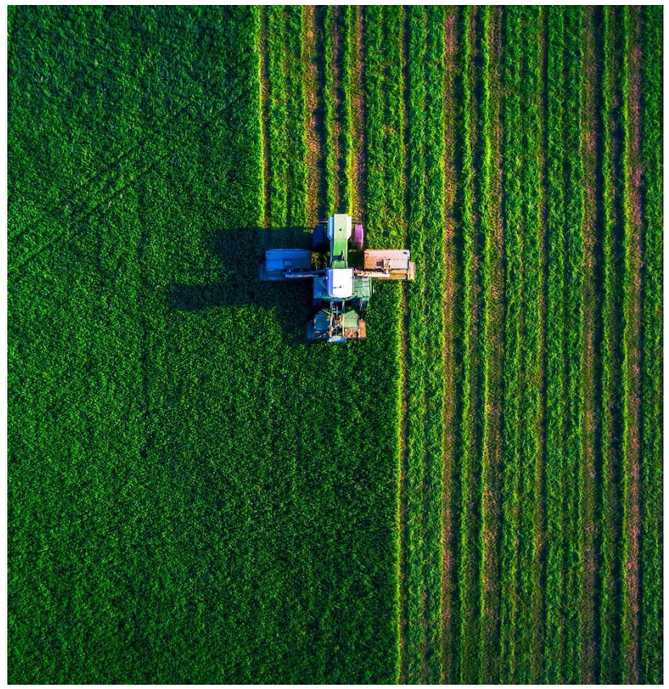
- Central, sub-national and local government;
- Other sub-national transport bodies;
- Local enterprise partnerships;
- Other major public sector organisations including focusing on education, healthcare, environment, etc;
- Major transport infrastructure providers e.g. Network Rail, Highways England, airport companies, port companies, etc;
- Research organisations, academia, universities and colleges;
- Professional institutions e.g. Institution of Civil Engineers, Chartered Institution of Highways and Transportation, Chartered Institute of Logistics and Transport, Transport Planning Society, Royal Town Planning Institute, etc;
- User groups e.g. Passenger Focus, disability groups, cycle groups;
- Industry and trade organisations e.g. Confederation of British Industry, Transport Focus, CoMoUK, Rail Delivery Group, Rail Freight Group, Chambers of Commerce, Freight Transport Association, National Farmers' Union, etc;
- Utility companies including electricity and communication network and service providers;
- Major landowners, developers and holders of portfolios of economic sites (e.g. retail, industrial and enterprise parks);
- Established, new and emerging mobility operators and service providers including traditional and new modes and services e.g. bus and train operators, freight and logistics operators, ride-hailing, MaaS providers, mobility asset sharing companies;
- Third sector mobility providers e.g operators of community transport;
- Vehicle and technology manufacturers;
- Specialist interest groups e.g. Campaign to Protect Rural England, Passenger Focus, Sustrans, etc; and
- Arts and entertainment e.g. Arts Council.
- Other adjacent sectors e.g. health, education, construction, etc.

It is vital that the partner sectors and organisations involved in delivering the strategy reflect the diversity of the South East. How partners are selected therefore needs to consider:

- The different user groups who are affected by future mobility, therefore, engagement should involve a cross-section of users; and
- The different areas within the South East ensuring that differing conditions in urban, peri-urban and rural, remote rural and coastal areas are taken into account.

The roles and responsibilities of partner sectors and organisations will vary across interventions and their types (engagement, policy, service and infrastructure). Broadly, the roles and responsibilities include:

- Development: building on previous learning from pilots, undertaking research, feasibility studies, initial design, business case development, piloting, testing, evaluating and learning;
- Funding: influencing, enabling, securing or providing funding to support the delivery of interventions;
- Commissioning: specifying and procuring interventions;
- Delivery: final design, manufacturing, construction, programming, testing and trialing up to initial operation;
- Operation: day-to-day operation, management and maintenance of services, modes and infrastructure including the dependencies of energy and digital communications;
- Monitoring and evaluation: information and data collection assessment, engagement and evaluation of interventions and the summarising and dissemination of finding; and
- Review: reviewing and updating of the strategy as implementation progresses and as signals, trends and trajectories appear and evolve over time.



Monitoring and evaluation

As described earlier a robust but applicable monitoring and evaluation framework is necessary to ensure that learnings are derived for the benefit of Transport for the South East and all partners and to accelerate the deployment and efficacy of future mobility interventions.

Overview

In overview, the Monitoring and Evaluation Framework is structured in a modular way with the following elements:

- Monitoring signals, trends and trajectories
- Seven key changes
- Service models
- Public sector policy
- Future mobility delivery outside of the strategy
- Early deployment
- Intervention monitoring and evaluation
- Strategy evaluation; and
- Reporting, dissemination and engagement.

This modular approach will enable monitoring and evaluation to be tailored and flexed according to the resources available.

Signals, trends and trajectories module

Monitoring should be undertaken of key signals, trends and trajectories not only of mobility but those that may affect the people, places and activities that mobility supports. These will be monitored in terms of the global and technological changes affecting environmental, economic and social challenges.

Seven key changes module

The seven key changes of mobility (cleaner transport, new business models, new modes, data & connectivity, changing attitudes and automation, plus aggregation) will also be monitored through the collation of evidence from global, national and South East case studies to provide a picture of how these changes are progressing.

Service models module

The developments in the service models identified within the Future Mobility Strategy could also be monitored by Transport for the South East, including:

- Ride-sharing;
- Ride-sourcing (sole use);
- Ride-sourcing (shared use);
- Mobility asset sharing;
- MaaS Platforms;
- Parking and kerb space management;
- Digital-as-a-Mode;
- Operator-focused freight models; and
- Consumer-focused freight models.

Public sector policy

Public sector responses to the signals, trends and trajectories and the seven key changes are reflected in the formulation of policy, therefore this monitoring and evaluation framework includes the tracking of changes in policy. The policy context can either be directive, as a means of realising a vision or policy objective, or it can highlight that technology has outpaced policy. In this instance, a review of policy context might highlight that new regulatory frameworks are needed to manage change effectively, and to prevent undesirable outcomes such as the formation of monopolies or social and economic exclusion from new modes and services. The focus for this element will not simply be on mobility but on the wider environmental, economic, social, spatial, digital and energy policy that influences the mobility eco-system and related policy.

Future mobility delivery outside of the strategy

As stated earlier, whilst the strategy will shape future mobility in the area, not all future mobility activity will be under the strategy's influence. There may therefore be activity occurring across the South East area which may not be part of the strategy but from which learning may be useful to the strategy and the wider group of stakeholders. The monitoring and evaluation framework therefore include the monitoring and review of future mobility activity across the South East.

Early deployment module

The establishment and success of future mobility modes, service models and infrastructure as business as usual across the South East is dependent on early deployment and the learnings gained. This framework therefore includes monitoring and evaluation of the early deployment of modes and service models both through the strategy and those that are independent of it. The framework takes a 'deploy, test, insights and dissemination' approach so that learning from the initial roll out of future mobility can quickly inform further developments. Crucially, this approach should allow information to be gained to support the development of local authority business cases promoting these new modes and service models across the South East.

Intervention Monitoring and Evaluation

The delivery of interventions within this strategy will be monitored on an ongoing basis with the monitoring dashboards created for each.

The dashboards will collate evidence on the delivery of the interventions including:

- What actions have been taken?
- What has been delivered?
- Who has been involved?

- How has it been delivered?
- What has been the impact on the vision and objectives?
- What do findings mean for future strategies and interventions?

Strategy evaluation

The strategy itself will be monitored through the collation of the monitoring dashboards to assess the overall level of delivery compared to the plans. This will be supported by the monitoring by the set of KPIs against which the overall progress of the strategy towards its vision and objectives will be assessed.

Reporting, dissemination and engagement

Reporting and dissemination of the findings of the monitoring and evaluation will be key to the strategy continuing to facilitate change. Whilst some dissemination should be periodic, providing overall longer-term findings, it is imperative that learning is also rapidly distributed around the South East so that practitioners can be reactive to findings and ensure that there is continuous improvement. Future mobility cannot wait for an annual report, information must be shared continuously. Therefore, the following presents a structure for reporting and dissemination:

- Reporting will be provided through:
  - An 'open source' portal to share learning;
  - Future Mobility Learning Notes – rapidly developed and distributed to stakeholders as and when learning occurs;
  - Ongoing updates to Future Mobility Shared Learning Hub as learning developed;
  - Quarterly M&E updates;
  - Annual M&E Report – 'State of Future Mobility in the South East'; and
  - Inputs into future mobility business cases elsewhere.
- Dissemination will be facilitated through;
  - Updates via e-mails to stakeholders;
  - A specific section on Future Mobility on the Transport for the South East website;
  - Future Mobility Forum and subject matter forums; and
  - An Annual South East Future Mobility Conference.

Updating the strategy

As the strategy has discussed, the field of future mobility is a rapidly changing one with signals often quickly transitioning through trends to trajectories and eventually to business as usual. During the development of this strategy, the world of future mobility changed, and it will continue to do so as the strategy is implemented. With such a dynamic area of focus, this is not a strategy that can be fixed and rigid as it would soon be left behind by developments.

The monitoring and evaluation framework, and the engagement that supports it, will ensure that the evidence behind the strategy is continually updated and always contemporary. The process for updating the strategy must therefore reflect both dynamic nature of its subject and the contemporary evidence.

Providing fixed timescales for a full update to this strategy may not be appropriate. As we saw during 2020 and into 2021, major shock events can bring rapid change to many aspects of our lives. However, the rate of change as we move beyond the COVID-19 pandemic is unpredictable. The resulting economic impact of the pandemic may slow some aspects of change whilst investment decisions as we rebuild may accelerate others. A key task of the monitoring and evaluation framework will therefore be to assess when is the right time to undertake a partial or full review of this strategy.

Summary and call to action

Transport for the South East's role in steering the future of mobility will focus on setting the policy framework for the South East, engaging with and guiding stakeholders at all levels of government and across industrial sectors, monitoring the emergence of future mobility, and working with partners to deliver change.

This strategy has set out a comprehensive suite of interventions to plot a path through this uncertainty to deliver engagement, policy, new services and infrastructure.

The range of stakeholders and partners involved in future mobility have been identified as well as the dependencies that need to be secured to deliver change. A monitoring and evaluation framework have been developed to ensure that the delivery of this strategy is checked and challenged, its impact assessed, and lessons are learned and disseminated.

However, Transport for the South East cannot deliver the future of mobility alone. Change requires the buy-in and support of all those organisations with a stake in mobility; those who plan it, deliver it and use it. If the South East is to achieve its aim of having a globally leading sustainable mobility eco-system, actions need to be accelerated with interventions adopted and delivered through partnership across the whole mobility eco-system.

TRANSPORT FOR THE
South East

Transport for the South East
County Hall, St. Anne's Crescent
Lewes, BN7 1UE
Transport for the South East@eastsussex.gov.uk

www.transportforthesoutheast.org.uk
@TransportForTheSouthEast