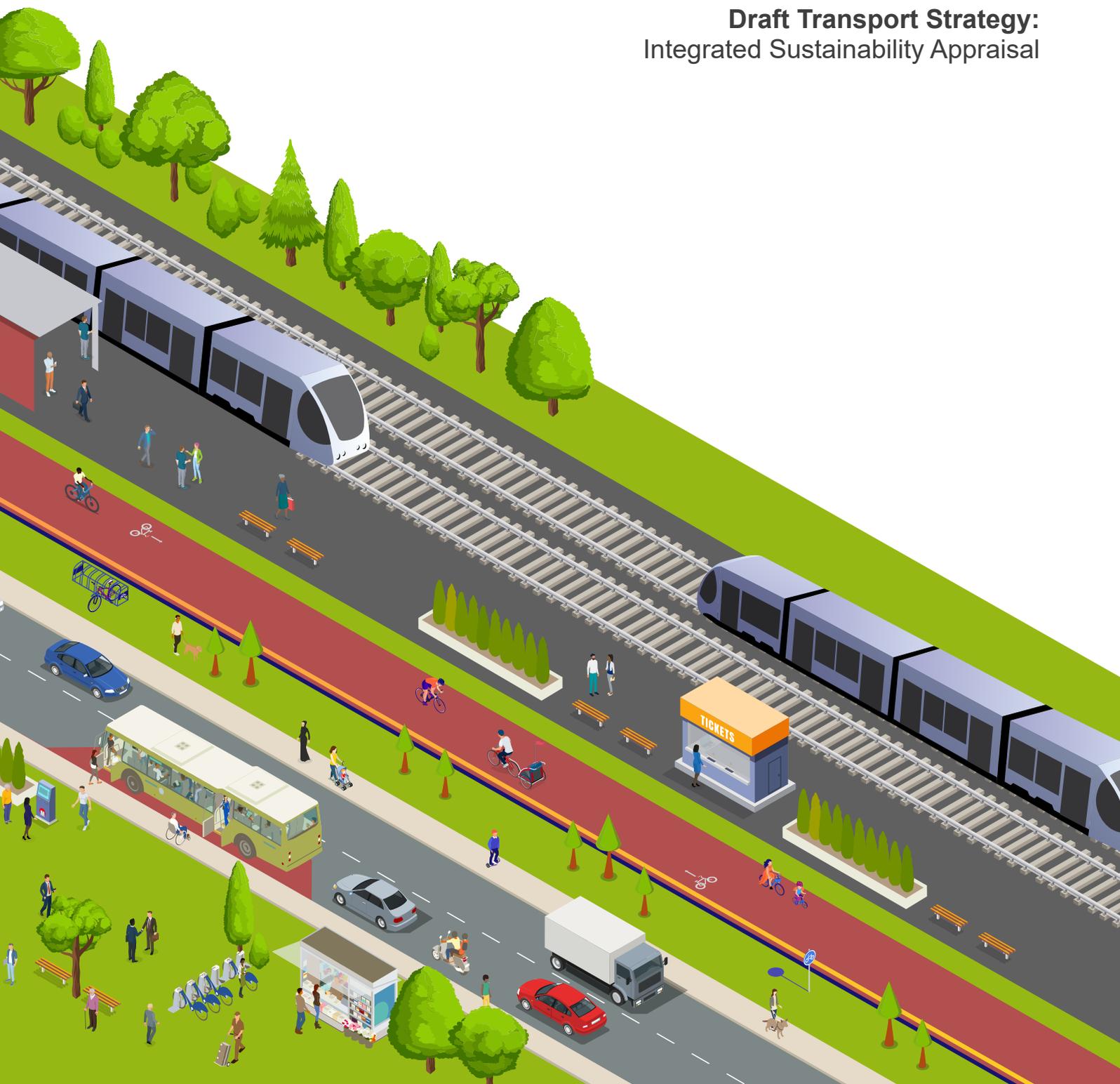


TRANSPORTEAST

Jacobs

Transport East Transport Strategy

Draft Transport Strategy:
Integrated Sustainability Appraisal



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Non-Technical Summary (NTS)

The Non-Technical Summary (NTS) for the Integrated Sustainability Appraisal of the Draft Transport East Transport Strategy is provided as a separate document and can be found here:

<https://www.transporteast.org.uk/public-consultation/consultation-documents>

List of Abbreviations

Acronym	Terminology
ALC	Agricultural Land Use
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BA	Broads Authority
CSA	Community Safety Assessment
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
ECC	Essex County Council
EcoW	Ecological Clerk of Works
EPSML	European Protected Species Mitigation License
EqIA	Equality Impact Assessment
EV	Electric Vehicle
GVA	Gross Value Added
HE	Historic England
HIA	Health Impact Assessment
HRA	Habitats Regulation Assessment
IDP	Investment and Delivery Plan
IMD	Index of Multiple Deprivation
IROPI	Imperative reasons of overriding public interest
ISA	Integrated Sustainability Appraisal
JNCC	Joint Nature Conservation Committee
JSNA	Joint Strategic Needs Assessment
LEP	Local Enterprise Partnership
LNR	Local Nature Reserves
LPAs	Local Planning Authority

Acronym	Terminology
LSOA	Lower Layer Super Output Areas
NCA	Natural Capital Assessment
NCA	National Character Area
NEA	National Ecosystem Assessment
NERC	Natural Environment and Rural Communities
NIA	Noise Impact Area
NMVOC	Non-methane volatile organic compounds
NNR	National Nature Reserves
NO₂	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NSIPs	Nationally Significant Infrastructure Projects
NTS	Non-Technical Summary
ONS	Office for National Statistics
PHE	Public Health England
PPS	Plans, Policies and Strategies
PRoW	Public Right of Way
RIGS	Regionally Important Geological Sites
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SFOE	Suffolk Friends of the Earth
SO₂	Sulphur Dioxide
SPA	Special Protection Areas
SPZ	Source Protection Zone
SSSI	Sites of Special Scientific Interest
TAN	Transport Action Network
TE	Transport East
WHO	World Health Organisation

Glossary

Term	Definition
Integrated Sustainability Appraisal	Combined environmental social and economic assessments
Accident	An accident involves personal injury occurring on the public highway (including footways) in which at least one road vehicle or a vehicle in collision with a pedestrian is involved and which becomes known to the police within 30 days of its occurrence. (Definition from Department of Transport)
Assessment	An umbrella term for description, analysis, and evaluation.
Air Quality Management Area (AQMA)	A non-permanent designation created if monitoring reveals that statutory air quality thresholds are being exceeded or will be exceeded in the near future.
Baseline	The existing conditions which form the basis of the environmental assessment
Bedrock	Hard rock that lies beneath a superficial cover of soils and sediments.
Biodiversity	Biological diversity, or richness of living organisms present in representative communities and populations.
Catchment	The area contributing flow to a point on a drainage system.
Community	Assemblage of interacting populations that occupy a given area or region.
Conservation	Preservation or restoration of the natural environment and wildlife.
Ecosystem	A biological community of organisms interacting with one another and their physical environment.
Ecosystem Services	The direct and indirect benefits provided by natural capital stocks/ assets.
Effect	The result of change on specific environmental resources or receptors.
Environmental Net Gain	Refers to taking steps to mitigate the high potential impact of infrastructure projects on natural capital, leaving the environment in a measurably better state compared to the pre-development baseline.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities
Habitat Regulations Assessment	Under the Habitats Regulations, all competent authorities must consider whether any plan or project will have a 'likely significant effect' on a European site. If so, they must carry out an 'appropriate assessment' (AA). This is known as Habitats Regulations Assessment (HRA).
Landscape	Human perception of the land, conditioned by knowledge and identity with a place or setting.
Lower Layer Super Output Areas	A geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.
Mitigation	Measure to avoid, reduce or offset potential adverse impacts.

Term	Definition
Natural Capital	Natural Capital is classified as the world's stock of natural resources, which includes geology, soils, air, water and living organisms.
River Basin District	The area of land and sea, made up of one or more river basins, together with the associated groundwater and coastal waters, identified by the Water Framework Directive as the main unit for the management of river basins.
Scoping Report	The purpose of a scoping stage is to describe the environmental context, by establishing the relevant baseline information, reviewing other relevant PPS and identifying environmental problems and opportunities. Scoping Reports also provide a proposed methodology to be used for assessing potential environmental effects.
Sites of Special Scientific Interest (SSSI)	Designated areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species in the UK. The site network is protected under the provisions of Sections 28 and 19 of the Wildlife and Countryside Act 1981 as well as the Amendment Act 1985 and the Environmental Protection Act 1990.
Soft Estate	refers to the environment (inclusive of natural habitats) which line transport infrastructure.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive74/409/EEC) to protect important bird habitats.
Source Protection Zone (SPZ)	Protection areas around public water supply sources
Strategic Environmental Assessment	The process by which information about the environmental effects of proposed plans, policies and programmes are evaluated under the SEA regulations.
Water Quality	The chemical and biological status of various parameters within the water column and their interactions, for example dissolved oxygen, indicator metals such as dissolved copper, or suspended solids

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1 Introduction and Background – ISA process

1.1 Background to the Transport East Transport Strategy

Transport East is the Sub-national Transport Body for Norfolk, Suffolk, Essex, Southend-on-Sea and Thurrock. The partnership provides a single voice for councils, business leaders and partners on the region’s transport strategy and strategic transport investment priorities. The partnership is developing its first Transport Strategy which aims to provide a sustainable strategic approach underpinning the region’s future transport investment and support Transport East’s ambitious and inclusive economic, social and environmental goals for the region to 2050.

Transport East currently has a pre-statutory status and while this also affects the status of the strategy and the legal requirements for environmental assessments, the intention is that preparation of the strategy will follow the same process as for a statutory transport plan. Transport East is therefore undertaking an Integrated Sustainability Appraisal to inform the development of the Strategy as part of ensuring that opportunities for enhancement are included and potential constraints are addressed by the Strategy.

The vision for the Transport East Transport Strategy is to create a thriving economy for the East, with fast, safe, reliable, and resilient transport infrastructure driving forward a future of inclusive and sustainable growth for decades to come. Figure 1.1 shows how the Transport Strategy will help deliver the goals for the region.

How will the strategy help achieve our goals?

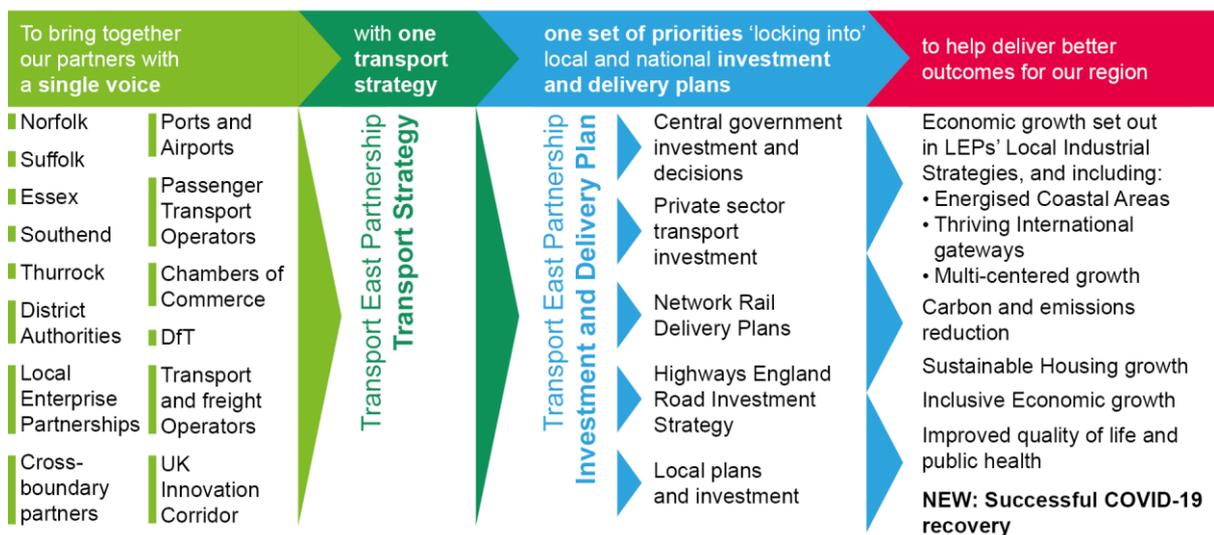


Figure 1.1: The role of the Transport Strategy

The audience for the Transport Strategy is wide-ranging and the aim is that the Strategy will provide:

- Confidence to national decision-makers and delivery bodies to invest in the region: including Government, transport delivery agencies and private sector investors.
- Clarity and co-ordination for local and regional partners: including local authorities, community groups, businesses, transport operators and the general public.

The draft Transport Strategy was developed following a comprehensive review of existing strategies and policy documents to identify current and future opportunities and the challenges faced by the region. This review was supported through extensive engagement with local authorities, business leaders and other partners. This process identified important wider outcomes that the Strategy should contribute to delivering, four strategic priorities and six core movement corridors.

The review included developing an evidence base comprising a series of “deep dive” studies (<https://www.transporteast.org.uk/consultation-documents>) covering the region’s road and rail network, international gateways, rural and coastal communities, and the specific role of transport in economic growth.

1.2 Geographical Scope of Transport East

The Transport East region is bordered by three other sub-national transport bodies; Midlands Connect, England’s Economic Heartland and Transport for the South East (Figure 1.2). The draft Transport Strategy addresses links to the north, west and south, as well as the needs of the Transport East area.

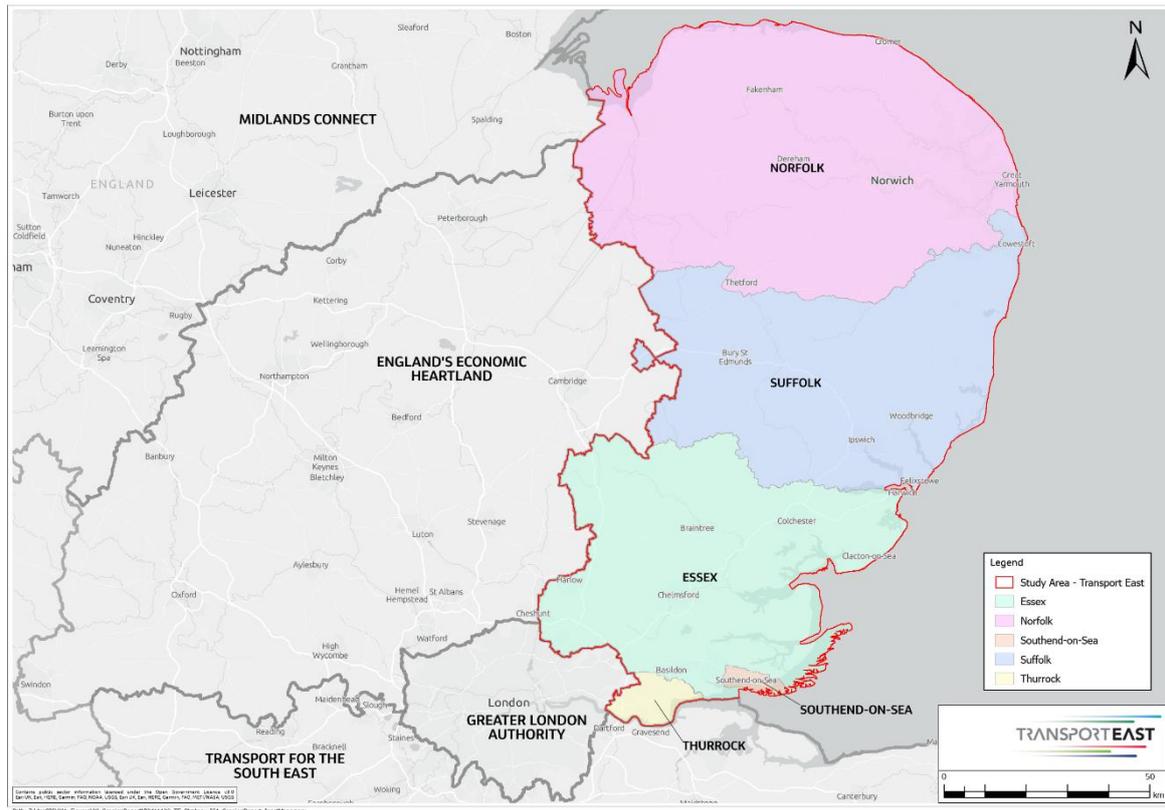


Figure 1.2: Location of Transport East

Transport East comprises of three county councils (Essex, Norfolk and Suffolk) as well as two Unitary Authorities (Southend-on-Sea and Thurrock), these five authorities are also transport authorities. It also comprises of 24 district/borough authorities and two Local Enterprise Partnerships (New Anglia LEP and South East LEP).

The region also has a number of significant designations, including three Areas of Outstanding Natural Beauty (AONBs – Norfolk Coast, Suffolk Coast & Heaths, and Dedham Vale), and The Broads which has status equivalent to a National Park.

1.3 Temporal Scope of Transport East

The Transport East Transport Strategy will be a plan to 2050. The best performing solutions to achieve the strategic actions of each of the four pathways are identified as priority schemes in a draft Investment and Delivery Programme (IDP) for the Region, which sets out clear timescales for the creation of a pipeline of solutions to come forward over the strategy’s lifetime. It is currently proposed that this will be updated annually and reviewed every 3 – 5 years to enable the strategy and delivery programme to adapt to the latest government objectives, funding approach and reflect new scheme proposals and progress against identified priorities.

1.4 Integrated Sustainability Appraisal (ISA) Process

Transport East is committed to improving the environmental, social, and economic wellbeing of the Region as indicated in the wider outcomes studies outlined in Section 2. As part of this commitment, Transport East is undertaking an Integrated Sustainability Appraisal (ISA) to inform the development of the Transport Strategy.

An ISA is a process for assessing the social, economic, and environmental impacts of a plan or strategy in a systematic and transparent way with the aim that sustainable development principles will underpin the strategy.

What are sustainable development principles?

According to the Brundtland Commission's report, *Our Common Future*, (1987), sustainable development means "*meeting the needs of the present without compromising the ability of future generations to meet their needs.*" The concept is often broken into three core concepts or "pillars": economic, environmental, and social.

"economic sustainability" focuses on the portion of natural resources that provide physical inputs for economic production, including renewable and exhaustible resources.

"environmental sustainability" adds greater emphasis on the "life support systems," such as the atmosphere or soil, that must be maintained for economic production or human life to even occur and this includes the need for example to address climate change, avoid loss of biodiversity, prevent pollution and reduce waste.

'social sustainability' focuses on the human effects of economic systems, and the quality of life, well being and health, promoting inclusion and combating inequality.

How is sustainable transport defined?

Transport enables the mobility of people and goods, enhancing economic growth and livelihoods while improving access to quality services, such as health, education and finance. It strengthens connectivity at all levels, helping integrate economies, improving social equity, enhancing rural-urban linkages and building resilience. There is also recognition of negative environmental, social and health impacts.

Sustainable transport seeks to fully realize the benefits while avoiding or alleviating the negative effects and can be defined as:

"the provision of services and infrastructure for the mobility of people and goods—advancing economic and social development to benefit today's and future generations—in a manner that is safe, affordable, accessible, efficient, and resilient, while minimizing carbon and other emissions and environmental impacts" (UN, October 2016)

This can be updated further to reflect commitments to achieve net zero carbon emissions, provide biodiversity and environmental net gain and ensure access to transport is inclusive and equitable.

The ISA is based around the Strategic Environmental Assessment (SEA) process and has five key stages (Figure 1.3), including an initial scoping stage providing context and focus for the assessment, and iterative assessment of the developing plan, followed by consultation on the assessment and draft strategy documents. Consultation responses are taken into account in the finalisation of the strategy and a statement is then published identifying how the ISA has been taken into account. The final stage is to monitor the implementation of the strategy and environmental and social impacts.



Figure 1.3: Key Stages in the ISA process

ISA Assessments

The Integrated Sustainability Appraisal (ISA) incorporates:

- Strategic Environmental Assessment (SEA) in accordance with the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004/ 1633, “2004 Regulations” as amended) (SEA regulations).
- Health Impact Assessment (HIA) using guidelines set out by the Public Health Observatories.
- Equality Impact Assessment (EqIA), as required by section 149 of the Equality Act 2010, as amended.
- Community Safety Assessment (CSA) as required by the Crime and Disorder Act 1998 and the Police and Justice Act 2006, as amended.
- Habitats Regulations Assessment (HRA) as required by the Conservation of Habitats and Species Regulations 2017, as amended.
- Natural Capital assessment to meet requirements in Government’s 25 Year Environment Plan and the 2021 Environment Act in relation to biodiversity net gain.

Further detail for each type of assessment is provided below.

Strategic Environmental Assessment

SEA is a means of systematically assessing the likely impact of a public plan, programme or strategy on the environment. SEA aims to offer greater protection to the environment by ensuring public bodies and those organisations preparing plans of a ‘public character’ (in this case, Transport East) consider and address the likely significant environmental effects.

SEAs are required under the SEA regulations¹, which transpose the SEA Directive (2001/42/EC). An SEA is mandatory for any plans, programmes or strategies which cover the following sectors: agriculture, forestry, fisheries, energy, industry, transport, waste or water management, tourism, town and country planning or land use and which set the framework for future development consent of projects subject to EIA regulations.

Qualifying plans under the SEA regulations as those which are ‘*subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government and required by legislative, regulatory or administrative provisions*’. Currently Transport East and the Transport Strategy under development does not have this formal status but there is commitment to undertake assessment complying with the regulatory requirements as part of supporting sustainable development objectives.

SEA is an iterative process involving collecting relevant data and establishing evidence of current baseline conditions and future trends, assessing potential environmental effects and proposing mitigation measures and recommendations to address the environmental effects identified at a strategic level.

Key guidance on SEA followed for the assessment approach for the TE Transport Strategy is set out in the *Planning Practice guidance on SEA and Sustainability Appraisal (2015)*² and the *Practical Guide to SEA (2005)*³. In addition, consideration is given to the Department for Transport’s Transport Analysis Guidance (TAG) including *TAG A3 Environmental Impact Appraisal (2019)*⁴ and *TAG A4.1 Social Impact Appraisal (2020)*⁵ in so far as they address qualitative assessments and define topic area issues and also *TAG Unit 2.1 Strategic Environmental Assessment for Transport Plans and Programmes*⁶.

An assessment framework is developed comprising objectives and assessment criteria relevant to the area and strategy proposals based on an understanding of environmental issues and opportunities from the policy and baseline review. This also forms the framework for integrating the requirements of each of the assessments below.

Natural Capital Assessment

The Government’s 25-year Environment Plan and the Environment Act 2021 introduce requirements for the use of natural capital assessment and the concept of infrastructure development providing biodiversity and environmental net gain. These requirements and their implications for schemes will be considered in the ISA and recommendations for the draft Transport Strategy on how these can be taken forward.

A natural capital approach can be used to understand the interdependencies between the natural environment, society and the economy, so that natural capital is considered holistically and integrated appropriately within decision making.

There are several policy and guidance documents which have identified the potential for transport infrastructure to contribute to the restoration and enhancement of natural capital and ecosystem services (particularly through proactive management of the 'soft estate') and these include:

- A Natural England report in 2014, investigating how land within or adjacent to transport corridors could be used or enhanced for green infrastructure that delivers biodiversity gain, ecological connectivity, and ecosystem services.
- The Environment Agency's Achieving Net Zero document⁷, containing information on grassland management, with a focus on road verges. It identifies management measures that could improve the ecosystem service provision of road verges, including carbon sequestration.
- The National Infrastructure Commissions' Natural Capital and Environmental Net Gain discussion paper, considering the impact of infrastructure development on natural capital assets, identifying current approaches to natural capital and environmental net gain, and setting out next steps to ensure the impact of infrastructure on natural capital is understood and addressed.⁸

Health Impact Assessment

Health Impact Assessment (HIA) is a process in which the likely or potential health effects on populations of a proposed plan or project are identified along with the potential mitigation methods to reduce or avoid any negative impacts. The process will also seek to identify opportunities to maximise benefits.

There is no formal requirement for HIA or specific methodology to be followed but there is good practice and policy guidance which can be applied. The approach taken for this ISA is to include and combine the HIA assessment within the ISA 'Health' topic throughout the assessment. The approach used for the HIA follows guidelines set out by the Public Health Observatories⁹.

Community Safety Assessment

Community Safety Assessments (CSA) are used to identify where possible community safety issues could occur. CSAs can also address potential issues by identifying opportunities to improve design function for future development, such as lighting design considerations to reduce road traffic collisions. In addition, personal security risks are considered such as how to improve personal security through either the reduction of opportunities for crime or through improvements to perceptions of security (where this perception would otherwise prevent potential users from travelling). Community Safety Assessments are required by the Crime and Disorder Act 1998 and the Police and Justice Act 2006, as amended.

Community Safety is included as an ISA topic for the assessment of the Transport Strategy.

Habitats Regulations Assessment

Habitats Regulations Assessments (HRA) are required in respect of any plan or project which, either alone or in combination with other plans or projects would be likely to have a significant effect on a site designated within the Natura 2000 network. An HRA is required by the Conservation of Habitats and Species Regulations 2017, as amended. Guidance on the Habitats Directive¹⁰ sets out four distinct stages for assessment:

- Stage 1: Screening: the process which initially identifies the likely impacts upon a Natura 2000 site of a plan or project, either alone or in combination with other plans or projects, and considers whether these impacts are likely to be significant – this is undertaken without considering mitigation;
- Stage 2: Appropriate Assessment: the detailed consideration of the impact on the integrity of the Natura 2000 sites of the plan or project, either alone or in combination with other plans or projects, with respect to the site's conservation objectives and its structure and function. This is to determine whether there will be adverse effects on the integrity of the site;
- Stage 3: Assessment of alternative solutions: the process which examines alternative ways of achieving the objectives of the plans or projects that avoid adverse impacts on the integrity of the Natura 2000 site; and

- Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain: an assessment of whether the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of Natura 2000 network.

The HRA requirements are incorporated into the ISA objectives and will be considered as part of the development of the strategy. In addition, to meet HRA requirements a Stage 1 assessment will be undertaken once the range of potential strategy interventions and proposals are identified and this will determine the requirement for a Stage 2 strategic level appropriate assessment to be undertaken for the Transport Strategy.

Equalities Impact Assessment

An Equalities Impact Assessment (EqIA) assesses the likely equalities effects of a policy, project or plan, as required by section 149 of the Equalities Act 2010, as amended. Its primary aim is to ensure that the policy project or plan does not cause disadvantages or discriminate against anyone whilst also considering potential opportunities for improving equality. The following protected characteristics are covered:

- Age
- Disability
- Sex and Gender
- Gender Reassignment
- Marriage and Civil Partnership
- Pregnancy and maternity
- Race
- Religion or belief; and
- Sexual Orientation

Equality and Diversity will be included as an ISA topic throughout the assessment of the Strategy.

1.5 ISA and HRA and development of the Transport Strategy

A summary of how the development of the Transport Strategy and the ISA and HRA processes interact is provided in Figure 1.4.

1.6 Purpose and structure of this Report

The purpose of an ISA is to ensure the sustainability of a strategic plan is considered, by assessing the environmental, social and economic impacts. The ISA considers the policy and legislative context, as well as identifies the current baseline of the Region. Following this the ISA aims to assess interventions and alternatives, as well as both cumulative and synergistic effects. The ISA will also recommend mitigation and monitoring plans. This report sets out:

- Chapter 1: Introduction and Background;
- [Chapter 2](#): Draft Transport Strategy proposals;
- [Chapter 3](#): Review of plans, policies and strategies;
- [Chapter 4](#): An overview of Consultation;
- [Chapter 5](#): A summary of the baseline, identifying issues and opportunities;
- [Chapter 6](#): ISA assessment methodology
- [Chapter 7](#): Assessment of the Transport Strategy
- [Chapter 8](#): Assessment of the Investment and Delivery Programme Approach
- [Chapter 9](#): Monitoring Plans
- [Chapter 10](#): Summary and Next steps
- Appendix A: Figures
- Appendix B: PPS Review
- Appendix C: Designations Designated sites of international importance
- Appendix D: Habitats and Ecosystems Service
- Appendix E: Summary ISA options appraisal matrix

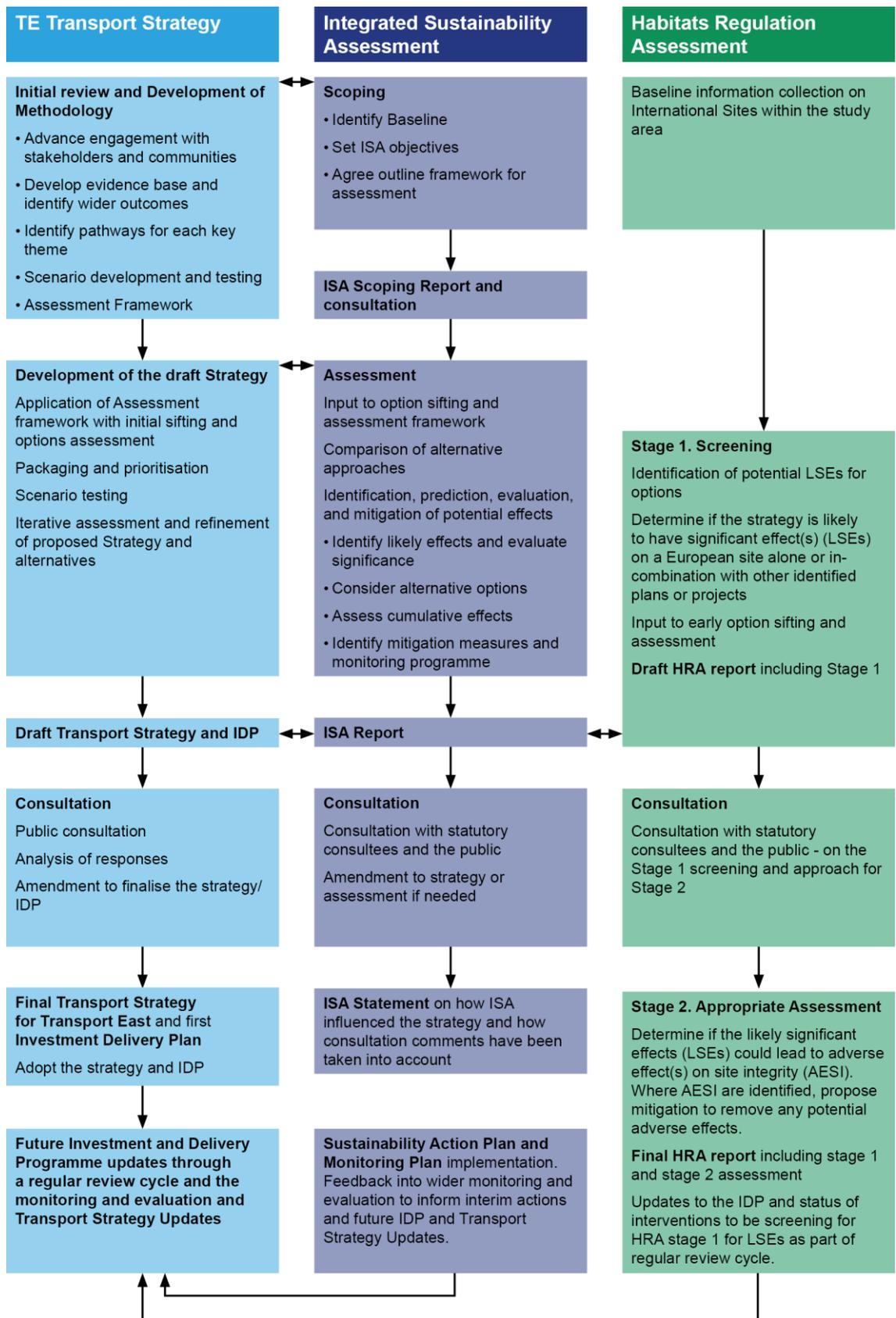


Figure 1.4: Summary of Strategy, ISA and HRA processes

2 Draft Transport Strategy proposals

2.1 Development of the draft Transport Strategy

Transport East is developing a single regional Transport Strategy and strategic Investment and Delivery Programme (IDP), to embed priorities in the delivery plans of government, local authorities, Network Rail, National Highways, the private sector and other transport providers.

The strategy identifies strategic priorities for the region, and the IDP sets out the approach for identifying the individual projects and programmes which are key to implementing the Strategy. The IDP also sets out the investment necessary for the delivery of the strategy (see draft IDP section 2.4).

2.2 Wider Vision and Priorities

The Transport East draft Transport Strategy has identified wider outcomes that the Strategy should contribute to delivery. These include outcomes such as reducing carbon emissions to Net Zero; promoting active, healthy and safe lives; promoting and supporting a productive and diverse economy; supporting skills attainment, retention and social inclusion with access to education, training and employment opportunities.

Regional wider outcomes the Transport Strategy will help deliver:

- reducing carbon emissions to net zero by 2040
- promoting active, healthy and safe lives for all
- promoting and supporting a productive, sustainable and diverse economy
- supporting access to education, training and employment opportunities for all;
- facilitating the sustainable energy sector;
- helping our growing areas to develop sustainably to create high quality, inclusive, distinctive and resilient places to live, work and visit;
- protecting and enhancing the built and natural environment.

These wider outcomes have been combined to inform the overarching vision for the Transport East Region:

Draft Transport Strategy Vision

A thriving economy for the East, with fast, safe, reliable and resilient transport infrastructure driving forward a future of inclusive and sustainable growth for decades to come

The draft Strategy sets out a series of pathways to follow to deliver this vision, focused on the following four strategic priorities for transport, unique to the Transport East region:

- **Decarbonisation to net-zero** – Working to achieve net zero carbon emissions from transport by 2040, building on our status as the UK’s premier renewable energy region.
- **Connecting growing towns and cities** – Enhanced links between our fastest growing places and business clusters. Improving access for people to jobs, supplies, services, and learning; enabling the area to function as a coherent economy and improving productivity
- **Energising rural and coastal communities** – A reinvented, sustainable coast for the 21st century which powers the UK through energy generation. Supporting our productive rural communities and attracting visitors all year round.
- **Unlocking international gateways** – Better connected ports and airports to help UK businesses thrive, boosting the nation’s economy and helping to level up communities through better access to international markets and facilitating foreign direct investment.

2.3 Regional Challenges

The “deep dive” studies, along with the production of the road and rail focused regional evidence base and decarbonisation review, identified challenges which are summarised against each theme in the Table 2.1 below.

Table 2.1: Summary of challenges per key theme

Key Theme	Challenges
Decarbonisation to net-zero	<p>Brexit impact on UK trade, imposing heightened barriers for accessing a range of decarbonisation capabilities and selling products & services to European Union member states.</p> <p>Public funding is currently skewed in favour of electrification compared to other alternative fuels. There is also currently significant public funding invested in fossil fuel related transport.</p> <p>There are concerns about the sustainability of battery manufacturing and whether an effective recycling method can be developed to minimise the environmental impact of lithium/rare metals earth mining but there are also potential replacements for lithium under development such as silicon or sodium-ion batteries. Recycling technologies for lithium batteries are not keeping pace with the rapid rise in EVs.</p> <p>Safety concerns over the reactivity, storage and transportation of hydrogen to be overcome to make it an acceptable and credible fuel source.</p> <p>Technological gap in electric vehicles (EVs) to enable longer distance ranges, and broader applications.</p> <p>Rollout of EV charging infrastructure.</p> <p>Hydrogen fuel cells are currently more expensive to manufacture than their EV counterparts but there are potential areas for future development such as large scale storage of hydrogen produced using renewables such as offshore wind energy.</p> <p>There is potential to consider use of recycled biofuels</p> <p>There are limited initiatives advancing ways to mass-produce biomethane.</p>
Unlocking International Gateways	<p>Ports and airports are reliant upon the resilience and reliability of the road and rail networks. More resilience and better recovery from disruption is required to support gateway expansion, encourage sustainability and encourage intra-regional connection. Specific issues include:</p> <p>Rail network operations are close to or at operational capacity for freight and passenger movement.</p> <p>Rail connectivity is London centric, with a lack of east-west connections, some initiatives are underway to help address this.</p> <p>The Strategic Road Network is essential for major ports, and the local road network is essential for regional ports. Many of the key routes have varying levels of infrastructure provision with unreliable journey times and are lacking resilience.</p> <p>There is a need for integrated logistics and manufacturing in the region to be support by growth at ports and airports, attracting inward investment within the region, and boosting jobs and regional exports.</p> <p>COVID-19 has posed one of the most significant challenges to freight and passenger movements in recent history with long-term consequences potentially for patterns of travel.</p> <p>Support is needed to lower operational, surface access and supply chain emissions in line with the national decarbonisation towards NetZero.</p> <p>Passenger movements are the primary function of airports but a minor function for some ports in the region. Much of passenger movement is London centric, with a need to boost accessibility catchments within the region, and tourism.</p>

Key Theme	Challenges
Energising Rural and Coastal Communities	<p>Coastal areas are significantly more likely to be below the average for England for many of the Index of Multiple Deprivation indicators, with rural areas tending to perform better in relation to these indicators, with the exception of education.</p> <p>Rural areas' main issues are around retaining skilled workers, particularly with a lack of real and perceived transport options to gain access to education, training and employment.</p> <p>Strategies to level up coastal and rural communities need to reflect their different challenges and opportunities.</p>
Connecting Growing Towns and Cities	<p>The region has poor east-west connectivity as well as some pockets of poor north-south connectivity, a lack of first mile-last mile (beginning and ending of a journey, for example travelling to a bus stop or railway station) options in some areas, and high levels of car dependency.</p> <p>Growth constraints include skill levels in the region being below the UK average and relatively low levels of innovation and entrepreneurialism.</p> <p>High-quality transport infrastructure has a role to play in tackling constraints by attracting skilled workers to the region, and better connecting residents to employment and education opportunities.</p>

Section 4 of the draft Transport Strategy identifies fifteen goals within each of the four strategic priorities along with the actions proposed to achieve these.

The strategy covers a large region and a wide range of areas with differing land uses and characteristics and this is recognised through the place-based approach for the strategy which has tailored proposals to the needs of each area.

In addition to the strategic priorities, Transport East has identified six core strategic corridors (Figure 2.1), linking key destinations within and beyond the Region which require particular focus. These corridors include growing urban areas, ports, airports and the road and rail connections between them and the rest of the UK. These corridors are described in section 5 of the draft Transport Strategy. Further investment will be needed along these if the region is to reach its potential as a thriving, connected, multi-centred economy, whilst reducing carbon emissions.

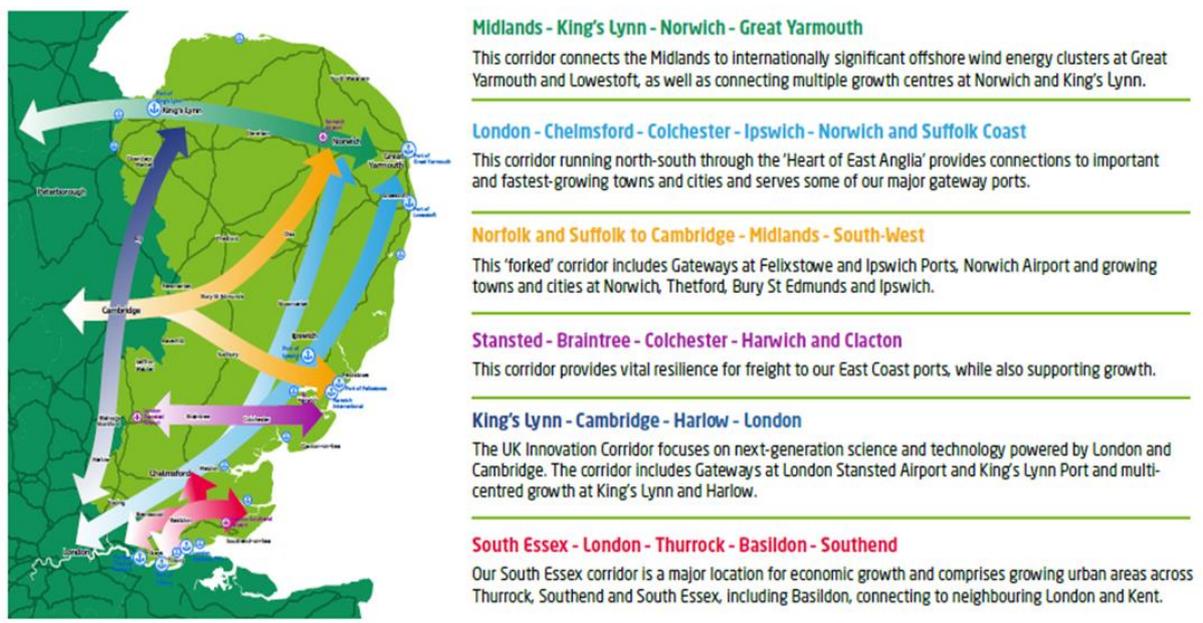


Figure 2.1: Strategic Corridors

Section 6 of the draft Transport Strategy outlines how the delivery of the strategy will be addressed through the 'Approach to investment and delivery programme' (draft IDP). This includes the following key stages:

- Development of an investment pipeline for the east
- Adoption of a strategic assessment framework to consider how the pipeline schemes align with the four strategic priorities.
- How Transport East will work with the Local Transport Authorities, and national partners for the delivery of the strategy
- Technical work programme to support implementation of the strategy
- Development of a Monitoring and Evaluation Plan to monitor performance in implementing the strategy through the interventions
- Regular reporting and review - the strategy will be updated periodically to ensure it remains relevant. This approach allows flexibility and will position the region to continue to support the government in achieving wider national aspirations.

The strategy provides examples and case studies and summaries how the different areas are expected to experience the strategy implementation below.

Rural and coastal communities

- A comprehensive electric vehicle charging network.
- A flexible public transport network providing accessible, reliable connections to the nearest urban centres.
- An efficient, safe and well-maintained local road network providing good connections to important local destinations.
- High-quality, inclusive walking and cycling networks to local centres, public transport hubs and for leisure purposes.
- A high-quality public realm in and around villages, town centres and visitor attractions.
- Ultra-fast broadband and 4/5G mobile connections for all.

Larger urban areas

- High quality, accessible, fast and efficient urban public transport networks, e.g. buses, supported by dedicated infrastructure.
- Comprehensive, safe, high-quality, inclusive urban walking and cycling networks
- Seamless interchanges to sustainable modes for 'last mile' trips into and out of urban areas (e.g. Park and Ride/ Park and Pedal).
- Faster, more reliable, road and rail links between towns and cities within the region and with important external destinations.
- Places and streets in towns and cities focussed on the needs of people rather than vehicles.
- Sustainable development concentrated around existing and new public transport hubs.

Ports and airports

- High speed, high-capacity strategic road and rail links providing reliable freight journeys between gateways and major distribution centres.
- Faster, accessible and more reliable road and public transport links for passengers between gateways, major urban centres within the region, and important external destinations.
- Efficient and well-maintained local transport networks connecting to nearby urban areas and local tourist attractions, providing access to local labour markets and encouraging visitors to stay in the region.
- Infrastructure to decarbonise the movement of goods.

2.4 Overview of draft IDP

The draft Investment and Delivery Programme (IDP) sets out the approach to developing a regional investment project pipeline and the supporting mechanisms that will be put in place to deliver the strategic priorities in the Transport Strategy.

The IDP has also been developed to align with the Government's national programmes to deliver major road and rail investment. It focusses on strategic scale projects and has not considered more localised schemes, as these will be included in the Local Transport Plans.

Role of Transport East

Transport East will not deliver the individual interventions identified in the IDP, but will manage the IDP, advise government on priorities and deliver a programme of technical work and business case development in partnership with local and national partners.

Transport East has engaged hundreds of partners across the region, throughout the entire process, from identification of strategic priorities to the prioritisation of individual schemes. The engagement throughout has maintained support within the region, including all local authorities.

Interventions and Assessment Approach

The approach for the developing the IDP included identifying a long list of potential schemes, programmes and actions. These interventions were categorised based on the stage of development, including idea, development and delivery levels and covered a wide range of types of measures. For the purposes of illustrating the range of schemes to be considered by the ISA, the main types of intervention included in the long list are identified in Table 2.2.

Table 2.2: Types of Interventions for the Transport Strategy

Types of interventions	
Active travel - infrastructure provision and behaviour change support	<ul style="list-style-type: none"> Roll out and expansion of local authorities' walking and cycling programmes Pedestrian and cycle crossings and on road links River crossings
Bus and passenger transport operations	<ul style="list-style-type: none"> Bus priority infrastructure supporting immediate operational challenges aligned to COVID-19 Rapid transit schemes
Port and airports	<ul style="list-style-type: none"> Measures supporting the connectivity, accessibility and operation of International Gateways
Rail related measures	<ul style="list-style-type: none"> Electrification schemes Line capacity improvement/journey time/enhancement Rail connection improvements Station improvements Freight capacity study Connectivity gap studies for rail timetables
Road related measures	<ul style="list-style-type: none"> Infrastructure to support electric vehicles and alternative fuels Demand management strategies New links or bypasses Road widening or dualling Junction/interchange new/ upgrades

Types of interventions	
	Road improvement strategic packages
Digital technology	Digital infrastructure to optimise transport, incentivising public transport & active modes and substituting trips
Studies and action plans	Supporting the implementation of schemes associated with the Transport Strategy

The pipeline projects were grouped into the following categories:

- Committed projects – these are projects that have been identified to be in the delivery stage. They are well developed and already have some delivery funding certainty and commitment from national government.
- Projects to be delivered in neighbouring authorities – the transport network extends beyond the Transport East region, this section identifies those projects that are important to and affect transport in the East but will be delivered by others.
- Regional strategic packages – This category contains a mix of projects to be progressed by Transport East, the Local Transport Authorities / Local Government or other delivery bodies. These packages highlight priority areas of work, where Transport East can;
 - support the case for investment, for example for the 5G roll out;
 - make the case for long-term funding certainty to enable ambitious programmes for active travel and urban sustainable programmes; and,
 - add to the technical programme to develop an evidence base to support future Local Government decisions, for example the road user demand management measures.
- Strategic corridors – This category identifies projects that sit along the core strategic corridors (Figure 2.1), that will either individually or in combination deliver the strategic priorities. These are a mix of road, rail and sustainable transport measures that are either at the idea or development stage. The progress of these projects to delivery will depend on the business case made for funding, recognising the government’s changing emphasis for projects to demonstrate significant contributions to decarbonisation and sustainable transport.

The interventions identified as ideas, in development or delivery but not yet committed projects were assessed against a framework which comprised:

- Potential to deliver Transport East Strategic Priorities
- Performance against Department of Transport (DfT), Critical Success Factors, and.
- Performance against ISA objectives

The IDP Approach also covers how ideas for the delivery of the Transport Strategy can be supported and developed further. New ideas from Transport East, its partners and others will continue to be added to the long list and any additional ideas will be assessed as part of the annual IDP management and review.

Funding

Funding the identified projects is necessary for the implementation of the strategy and is often linked to external decisions for delivery. The local authorities in the region are fully committed to the IDP Approach and already make a substantial contribution, however significant additional support will be required from government.

In addition to government funding, Transport East will work with partners to identify appropriate funding streams and private sector investment to further support the funding and delivery of the IDP. Information on identified funding streams is set out in section 3.6 of the draft IDP Approach.

3 Review of Plans, Policies and Strategies

3.1 Overview

The Transport East Transport Strategy will both affect and be affected by other plans, policies and strategies (PPS), at a national, regional and local level. It is therefore necessary to review these PPS to identify key themes and issues to be considered during the ISA. An initial review of PPS was undertaken as part of the ISA Scoping Report and has been updated to reflect consultation comments and recently published documents. This chapter provides a brief overview highlighting key PPS considered in the assessment of the strategy and where relevant considered for potential interactions and cumulative effects.

The review is primarily focussed on national and regional level (including county and unitary) PPS and has been used to develop SEA objectives and criteria for the assessment. A high-level review of all the PPS considered is documented in Appendix B, and the key themes identified from the PPS review are summarised against each ISA topic area in Table 3.1.

National Level

International treaties and commitments are covered in the PPS review but as these are implemented through national legislation and policy, they are not considered separately. Key national level PPS are listed below:

- Transport Investment Strategy¹¹
- National Planning Policy Framework¹²
- The 25 Year Environment Plan¹³
- Environment Act¹⁴
- Clean Air Strategy¹⁵
- Biodiversity 2020: Strategy for England's wildlife and ecosystem services¹⁶
- Inclusive Transport Strategy¹⁷
- National Networks National Policy Statement¹⁸
- Airports National Policy Statement¹⁹
- Decarbonising Transport – Setting the Challenge²⁰
- Decarbonising Transport – A Better, Greener Britain²¹
- Bus Back Better: National Bus Strategy for England²²
- The Governments statement on the historic environment for England 2010²³

Regional Level

Regional plans and policy include those policies or plans set by government at a sub-national level, but above Local Authority level (this would be local policy). For the Transport East region these include (but are not limited to):

- Integrated Transport Strategy for Norfolk and Suffolk (New Anglia Local Enterprise Partnership, 2017)
- Local Industrial Strategy (New Anglia Local Enterprise Partnership)
- Broadland Futures Initiative
- Economic Strategy for Norfolk and Suffolk (New Anglia Local Enterprise Partnership)
- South-East LEP Economic Recovery and Renewal Strategy
- East Inshore and East Offshore marine plans 2014
- Transport for South East Transport Strategy
- England's Economic Heartland Transport Strategy
- Mayors' London Transport Strategy
- Midlands Connect Strategy and Midlands Connect Transport Strategy Refresh

Local Level

Local Transport Plans

Local Transport Plans are developed and implemented by local transport authorities, which in the Transport East region are the three County Councils and two Unitary Authorities.

Local Transport Plans outline the Local Transport Authorities' long-term strategy and objectives for their transport networks. They can also include short-term Implementation Plans to indicate how the authority proposes to deliver the Local Transport Plan proposals, including their priority issues and schemes over the plan period. Strategic Environmental Assessments are undertaken for Local Transport Plans.

The Local Transport Plans in the TE region have been reviewed by both the PPS review (Appendix B), and the Task 1A initial review, listed below:

- The Essex Transport Strategy: The Local Transport Plan for Essex 2011 - 2025
- Norfolk County Council Local Transport Plan 2026
- Suffolk County Council Local Transport Plan 2011 - 2031
- Southend Local Transport Plan 3 2011 - 2026
- Thurrock Transport Strategy 2013 - 2026

Development Plans

The Planning and Compulsory Purchase Act 2004 requires Local Planning Authorities (LPAs) to determine applications for planning permission in accordance with the Development Plan for their area unless material considerations indicate otherwise. The Development Plan for an area will include:

- the relevant Local Plan prepared by the District or Borough Council (including Unitary Authorities);
- the relevant Minerals and Waste Plan/s prepared by the County Council (including Unitary Authority); and
- any adopted Neighbourhood Plans prepared by Parish Councils.

Local Plans set out a vision and strategic priorities for the development of their area, to address housing needs (including to identify a 5-year housing land supply in accordance with the National Planning Policy Framework) and other social, economic and environmental priorities. Local Plan allocations and policies for housing and other economic development will influence the need to travel and for transport infrastructure, and vice versa. All Development Plans are subject to SEA and are prepared in consultation with the community. The current Local Plans and Minerals and Waste Plans for the Transport East Region are listed in Appendix B.

Other local level plans

Other local level plans and strategies have been identified in the Transport East Region, related to the local economy, climate change, flood risk management, landscape, heritage, walking, cycling and rail travel, infrastructure, strategic planning, health, and rural communities. Those prepared by County and Unitary Authorities are listed in Appendix B.

3.2 Key Policy and Themes

From the review of international, national, regional and local PPS, relevant PPS and key themes were identified (See Table 3.1).

Table 3.1: Key PPS and relevant key themes

ISA Topic	Key PPS	Key Themes
Population and Socioeconomics	<p>Road Investment Strategy 2 (RIS2)</p> <p>National Planning Policy Framework</p> <p>Clean Growth Strategy</p> <p>Economic Strategy for Norfolk and Suffolk</p> <p>Local Industrial Strategy</p> <p>Economic plan for Essex</p> <p>The organisational strategy (2017 – 2021) and plan (2021)</p> <p>The Essex Transport Strategy: The Local Transport Plan</p> <p>Norfolk Delivery Plan</p> <p>Together for Norfolk</p> <p>Suffolk County Council Local Transport Plan</p> <p>Suffolk Framework for Inclusive Growth</p> <p>Ipswich Strategic Planning Area Report</p> <p>Bus Back Better: National Bus Strategy for England</p> <p>Southend Local Transport Plan</p> <p>Thurrock Transport Strategy</p> <p>Gear Change (and Gear Change: one-year-on)</p>	<p>Housing requirements</p> <p>Improve transport networks and access to employment sites</p> <p>Support local business and economies</p> <p>Prosperity – Support Economic growth</p> <p>Schemes must achieve social benefits</p> <p>Aims to maximise social and economic benefits</p> <p>Sustainable recovery post-covid</p> <p>Connectivity of population to facilities and resources/international gateways</p>
Equality and Diversity	<p>Inclusive Transport Strategy</p> <p>The Future of Essex</p> <p>Essex Joint Health and Wellbeing Strategy</p> <p>Together for Norfolk</p> <p>Suffolk County Council Business Plan</p> <p>Suffolk County Council, Safety, Health and Wellbeing Strategy</p> <p>Suffolk Framework for Inclusive Growth</p>	<p>Inclusive growth</p> <p>Promote equality</p> <p>Create inclusive communities</p> <p>Improving access to transport networks to ensure full inclusiveness</p> <p>Access to employment, services and amenities</p> <p>Affordability of transport</p>
Health	<p>National Planning Policy Framework</p> <p>Road Investment Strategy 2 (RIS2)</p> <p>Clean Air Strategy</p> <p>The Future of Essex</p> <p>The organisational strategy (2017 – 2021) and plan (2021)</p> <p>The Essex Transport Strategy: The Local Transport Plan</p> <p>Essex Joint Health and Wellbeing Strategy</p> <p>Norfolk County Council Public Health Strategy</p> <p>Suffolk County Council, Safety, Health and Wellbeing Strategy</p>	<p>Planning policies should aim to achieve healthy, inclusive safe places</p> <p>Improving access to health services</p> <p>Reduce health inequalities</p> <p>Promote healthy lifestyles</p> <p>Promote active travel</p>

ISA Topic	Key PPS	Key Themes
	Suffolk Framework for Inclusive Growth Suffolk Road Safety Strategy	
Community Safety	Road Investment Strategy 2 (RIS2) The Future of Essex The organizational strategy (2017 – 2021) and plan (2021) Essex Flood Risk Management Strategy Norfolk Transport Asset Management Plan Suffolk Framework for Inclusive Growth Suffolk Flood Risk Management Strategy Bus Back Better: National Bus Strategy for England – all partner authorities	Improve road safety Safe Technology Improve quality and reduce negative impacts of existing strategic networks Create safe communities
Biodiversity	National Planning Policy Framework Environmental Act 2021 25 Year Environmental Plan UK Post-2010 Biodiversity Framework Biodiversity 2020: Strategy for England’s wildlife and ecosystem services Green Essex Strategy Suffolk Nature Strategy Green Infrastructure Essex Strategy Green Infrastructure Plan for Thurrock St Edmundsbury Green Infrastructure Strategy (West Suffolk) Essex Biodiversity Action Plan Suffolk Local Biodiversity Action Plan Southend-on-Sea Local Biodiversity Action Plan Thurrock Biodiversity Study 2006-2011	Conserve and enhance, particularly designated sites and priority habitats Protection of irreplaceable habitats Avoid species decline Restoration of natural habitats - Nature Recovery Networks Biodiversity Net Gain delivery Contribute to local biodiversity action plans
Water Environment	National Planning Policy Framework Road Investment Strategy 2 (RIS2) National Flood and Coastal Erosion Risk Management Strategy (FCERM) Future Water: Water Strategy for England East Inshore and East Offshore marine plans Anglian Water Plan Essex Flood Risk Management Strategy Norfolk Local Flood Risk Management Strategy Suffolk Flood Risk Management Strategy Broadlands Futures Initiative	Improve and maintain good water quality Minimise the risk and impacts of flooding Adapt plans to account for the impacts of climate change

ISA Topic	Key PPS	Key Themes
Air Quality	National Planning Policy Framework (NPPF) The 25 Year Environment Plan Clean Air Strategy	Reduction of polluting emissions Improve Air Quality
Noise and Vibration	National Planning Policy Framework Noise Policy Statement for England Draft Road Investment Strategy	Avoid noise disturbance Promote good health and quality of life through effective management of noise
Climatic Factors	Clean Growth Strategy National Planning Policy Framework Decarbonising Transport - Setting the Challenge Transport Decarbonisation Plan 25 Year Environment Plan Norfolk Climate Change Strategy Suffolk County Council Business Plan Suffolk Climate Emergency Plan Suffolk Framework for Inclusive Growth	Reduction in GHG emissions Mitigating and adapting to climate change Utilise renewable energy Net Zero aims Decarbonisation of transport
Landscape/Townscape and Visual	Norfolk Access Improvement Plan 25 Year Environmental Plan National Planning Policy Framework (NPPF) Seascape Character Assessment Local Plan for the Broads Landscape Character Assessment – the Broads Suffolk Coast & Heaths Area of Outstanding Natural Beauty (AONB) Management Plan 2018 -23 The Norfolk Coast Area of Outstanding Natural Beauty Five Year Strategy Dedham Vale Area of Outstanding Natural Beauty (AONB) and Stour Valley Management Plan 2016-2021	Conserve and enhance landscape and scenic beauty Protect landscape and townscape character Long term management and maintenance of Green Infrastructure elements (and ecological elements)
Cultural Heritage and Archaeology	National Planning Policy Framework 25 Year Environmental Plan Government's statement on the Historic Environment	Conservation and enhancement of designated and non-designated heritage features Maintain local distinctiveness
Soils, Geology and Contaminated Land	National Planning Policy Framework The 25 Year Environment Plan Norfolk Geodiversity Action Plan Essex Minerals Local Plan (and review)	Protect sites of geological value and soils Sustainable use of minerals Reduce landfill disposal Maintain environmental standards

ISA Topic	Key PPS	Key Themes
Material Assets and Resources	<p>Transport Investment Strategy</p> <p>National Planning Policy Framework</p> <p>Airports National Policy Statement</p> <p>National Networks National Policy Statement</p> <p>Economic Strategy for Norfolk and Suffolk</p> <p>Local Industrial Strategy</p> <p>East of England Route Strategy</p> <p>The organisational strategy (2017 – 2021) and plan (2021)</p> <p>Green Essex Strategy</p> <p>Norfolk Transport Asset Management Plan</p> <p>Suffolk Rail Prospectus</p> <p>Decarbonising Transport - Setting the Challenge</p> <p>Decarbonising Transport – A Better, Greener Britain</p> <p>Essex and Southend-on-Sea Waste Local Plan</p> <p>Mineral and Waste local plans</p> <p>National Planning Policy for Waste and Waste Management Plan for England 2021</p>	<p>Sustainable development, Resource and energy efficiency,</p> <p>Waste hierarchy and minimising waste to landfill</p> <p>Decarbonisation</p>
Natural Capital and Ecosystem Services	<p>25 Year Environmental Plan</p> <p>Environment Act 2021</p> <p>Biodiversity 2020: Strategy for England’s wildlife and ecosystem services</p> <p>The Natural Capital Evidence Compendium for Norfolk and Suffolk</p> <p>Green Essex Strategy</p>	<p>Minimise resource footprint</p> <p>Work towards sustainable land management</p> <p>Support carbon sequestration initiatives</p> <p>Work to increase species richness, abundance, and ecological resilience</p> <p>Improve biosecurity</p> <p>Develop plans in preparation for increasing likelihood of extreme climate events</p> <p>Protect and enhance designated sites and habitats</p> <p>Increase use and inclusivity of natural assets across all user groups</p> <p>Environmental net gain</p>

4 Consultation

4.1 Scoping Consultation

As part of the process for undertaking the ISA for the draft Transport Strategy, an ISA Scoping Report was provided for consultation setting out the context for the assessment including a plan, policy and strategy review and description of the baseline environment and key trends. The methodology for the assessment was also outlined.

The ISA Scoping Report was subject to a statutory 5-week consultation as required under the SEA regulations. Following this consultation, comments have been collated and taken into consideration during the development of both the ISA and the draft Transport Strategy.

Comments were received from the following statutory consultees:

- The Broads Authority (BA)
- Historic England (HE)
- Forestry Commission
- Essex County Council (ECC)
- West Suffolk District Council

In addition, comments were received from the following non-statutory bodies:

- Suffolk Friends of the Earth (SFOE)
- Norfolk CPRE
- Transport Action Network (TAN)

No comments were received from the Environment Agency and Natural England for the ISA Scoping Report.

The consultation feedback received has been considered and addressed. A summary of the key comments and responses is set out in Table 4.1 below.

Table 4.1: Key consultation feedback and responses

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
1. Transport Strategy: Emerging strategic approach	The BA requested additional strategy actions and ideas on public transport and active travel, a modal shift from air to rail, and consideration of water-based transport.	The draft Transport Strategy includes a range of proposed actions supporting modal shift across each of the 4 Pathways. Recommendations from our Active Travel and Passenger Transport Reports have fed into the development of the Transport Strategy and work to explore water-based transport is included in Goal 9 – Improving coastal connections.
2. Transport Strategy: Workplace scenarios	BA and ECC noted that a third workplace scenario could be considered (a higher level of remote working than 2019, but not as much as mid 2020), and queried the baseline travel assumptions.	<p>The purpose of the scenario development and testing procedure was to identify a set of possible futures for the region, to quantify these in a rigorous manner, and then to explore their implications for the ability of the Transport Strategy to deliver both the wider and transport outcomes.</p> <p>In order to do this, relative extremes of potential variables outside of Transport East’s control were considered, including change in level of remote working. The results of this found that if high levels of remote working were achieved, there would be 26% fewer daily trips than in a “back to normal” scenario where people revert to pre COVID-19 commuting patterns.</p> <p>It is acknowledged that potentially neither the “back to normal” or high levels of remote working workplace scenarios may be realised and as such the strategy has been developed to ensure that it focusses on other areas, such as modal shift and alternative fuels, not just reducing the need to travel</p>

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
3. Transport Strategy	Norfolk CPRE highlighted the importance of improving rural bus services, as explained in the CPRE report “Every village, every hour: a comprehensive bus network for rural England” (March 2021)	Improving accessibility for rural areas is promoted within the strategy through a variety of measure, including the promotion of demand responsive rural passenger transport services.
4. Transport Strategy: Regional challenges - Decarbonisation	SFOE requested decarbonisation be prioritised urgently and a timescale for net zero carbon emissions in the region be defined. SFOE welcomed the promotion of a shift to active travel and public transport, to reduce car travel and reduce carbon emissions, and queried how the strategy would support these. TAN requests greater definition of carbon emissions reduction ambition, pathways and intermediate targets, in light of IPCC report and Government’s Transport Decarbonisation Plan.	<p>Decarbonising transport emerged as a priority early in our technical and engagement work to develop the Transport Strategy.</p> <p>To strengthen our understanding Transport East commissioned Energy Systems Catapult to establish an initial baseline of CO2 emissions and modelled a series of net zero targets. See draft Transport Strategy section 2.2 - The decarbonisation challenge.</p> <p>Net zero carbon transport is a core priority within the Strategy and informs the other three Pathways. The draft Transport Strategy aim is to achieve net zero transport by 2040. See draft Transport Strategy section 4.2 - Decarbonisation to Net Zero.</p>
5. Transport Strategy: Regional challenges - Connecting our Towns and Cities	<p>SFOE object to more road building due to impacts on wildlife, landscape, and traffic generation, and to investment in fossil fuels or biofuels. SFOE objects to new roads and encourages reinstatement of railway lines.</p> <p>Queried the sustainability of a ‘high growth’ trajectory.</p>	<p>The aims of the Transport Strategy are to balance a range of needs, challenges, constraints and opportunities including addressing current issues such as congestion and connectivity to support economic and social and working towards meeting future goals including as a priority decarbonisation to meet net zero carbon targets.</p> <p>As explained in comment 1 above, it is acknowledged that a range of scenarios have been considered and potentially neither the “back to normal” or high levels of remote working workplace scenarios may be realised and as such the strategy has been developed to ensure that it focusses on other areas, such as modal shift and alternative fuels, not just reducing the need to travel</p> <p>Account is taken of potential of impacts through the ISA and the mitigation and monitoring proposed.</p>
7. Transport Strategy: Regional challenges - Unlocking international gateways	SFOE queries sustainability of encouraging globalised trade at ports, requests encouragement of fewer ‘food miles’ and similar initiatives and agrees with increased use of rail for freight. Requests more emphasis on a circular economy, to reduce waste and resource use through the repair, re-use and recycling of materials.	<p>Although this is outside the scope of the Transport Strategy and Transport East’s control, we are proposing to try and influence future placemaking to ensure that people can live and work locally, enabling them to support local businesses and local suppliers reducing movement of both people and goods.</p> <p>The ISA includes recommendations to apply the waste hierarchy and how this also would be supportive towards reducing carbon</p>
8. Transport Strategy: Regional challenges - Re-energising	BA and SFOE raise concern about an over-reliance on electric vehicles. BA requested that ‘decarbonising of transport’ theme on p9 includes a defined	The Transport Strategy sets out a multi-faceted approach to decarbonising transport. The primary focus is on reducing the need to travel along with reducing the distance travelled. If there is still a need to travel, the next focus is on shifting as many trips as possible to sustainable transport. Finally if this

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
our Rural and Coastal Communities	aim to reduce miles driven (referring to the balanced pathway in the 6th Carbon Budget) and reduce flights. BA requests clarity on definition of Net-Zero Emissions.	<p>cannot be achieved, then the focus is on using alternative fuels.</p> <p>Due to the nature of the region and depending on the location of future growth within the region, providing the required sustainable transport in rural areas to achieve modal shift may not be viable and so there will be a need to include alternative fuels.</p> <p>Transport East commissioned Energy Systems Catapult to establish an initial baseline of CO2 emissions and modelled a series of net zero targets. See draft Transport Strategy section 2.2 - The decarbonisation challenge</p> <p>Net Zero emissions used in the Transport Strategy refers to net zero carbon emissions related to transport specifically.</p>
9.Transport Strategy: Regional challenges - Re-energising our Rural and Coastal Communities	SFOE objects to the term 'energy coast' along the designated Suffolk Coast & Heaths AONB and Heritage Coast, queries how the strategy will support the coast's tourist economy, landscape and wildlife, and how it can make quiet recreation in countryside easier to access, to benefit physical and mental health.	<p>The Transport Strategy recognises the different economic sectors within coastal areas including tourism and the natural heritage of our coast.</p> <p>Within Goal 8 – increasing access for rural and coastal communities, particularly the active travel section, we recognise the role improved active travel networks play in increasing sustainable access to blue and green spaces and the linked health benefits.</p>
10.ISA Approach: ISA Assessments	TAN requests consideration of lifecycle costs of vehicles that use the transport infrastructure, when assessing new infrastructure proposals, inclusion of aviation emissions, and the efficiency of hydrogen production.	<p>The lifecycles costs of vehicles using infrastructure is outside the scope of the Transport Strategy</p> <p>Aviation emissions are also not covered by this strategy but (refer to the NPS for Aviation) although the strategy does set out its strong support for the decarbonisation of the international aviation industry (see goal 14) through the national JetZero approach.</p> <p>Hydrogen is one of the potential fuel sources and production efficiency in terms of carbon would need to be part of future considerations of the benefit for this fuel use going forward to achieve net zero carbon emissions.</p>
11.ISA Approach: Natural Capital	TAN is critical of the discussion of how transport infrastructure can contribute to the restoration of biodiversity and ecosystem services, and refer to impacts of severance, pollution and loss of habitat from road building.	The impact of infrastructure on biodiversity through severance, habitat loss, pollutions and disturbance are part of the ISA assessment. While there is mention of potential opportunities that can be included in infrastructure design these cannot be considered without first taking account of potential losses - see ISA objective on biodiversity.
12.ISA Approach: Health Impact Assessment	TAN highlights the need to scrutinise health assessment for gaps and assertions, including on impacts on non-drivers, including the disabled, children, women and other disadvantaged groups, and impact of road building on public transport, severance and pollution.	These comments have been taken on board to strengthen specific consideration of these groups –in the in baseline and ISA objectives/criteria.

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
13. Review of Plans, Policies and Strategies	Consultees requested additional plans, policies and strategies be considered, including on the NPPF, NPPG, South East LEP, Broads Authority plans, AONB related plans, local Green Infrastructure strategies, Biodiversity Actions Plans, the Norfolk Geodiversity Audit	Additional PPS noted have been considered and included where available.
14. Review of Plans, Policies and Strategies – Climate change	BA requested the Committee on Climate Change Balanced Pathways be considered. ECC requested Net Zero: Making Essex Carbon Neutral be included. SFOE requested inclusion of the Paris Agreement, the Government's National Determined Contribution target of 68% reduction in greenhouse gas emissions by 2030 from 1990, the Transport Decarbonisation Plan, and Gear Change.	<p>Additional PPS noted are considered and included.</p> <p>Transport East commissioned Energy Systems Catapult to establish an initial baseline of CO2 emissions and modelled a series of net zero targets. See draft Transport Strategy section 2.2 - The decarbonisation challenge</p> <p>Net zero carbon transport is a core priority within the Strategy and informs the other three Pathways. The draft Transport Strategy aim is to achieve net zero transport by 2040. See draft Transport Strategy section 4.2 - Decarbonisation to Net Zero.</p> <p>Carbon emissions analysis has been commissioned by Transport East to understand the baseline trajectory for the region to 2050, and the impact of different scenarios on that trajectory.</p>
15. Health: Active travel	BA requested greater emphasis on the public health benefits of supporting active travel. Essex CC asked for greater acknowledgement on how school travel can contribute towards wider health outcomes and the environment around schools.	The draft Transport Strategy includes strategy goals that are supportive of active travel and the benefits of this. The engagement with schools that was part of the strategy development and actions arising from this.
16. Community Safety: Accidents	BA and TAN query use of the term 'accidents' as outdated, TAN state collisions should be used.	The accident term was used as referenced by the Department for Transport, and data provided in the report refers to information from the DfT and STATS19. Transport East recognises that this includes collisions and prevention has due importance within the strategy. The draft Transport Strategy terminology has been updated to reflect emerging practice.
17. Community Safety: Road danger	TAN request mention of the issue of road danger and perception of road danger, which reduces walking and cycling, particularly new and bigger roads which increase traffic levels.	Perceptions of road safety and impacts were noted as an issue and included in the assessment framework but have been strengthened in the baseline information. Community severance and active mode safety considerations are taken into consideration in the assessment. The draft Transport Strategy refers to the Safer Systems approach - see Goal 7- Eliminating road danger
18. Biodiversity: Local wildlife sites	BA requested consideration of county wildlife sites, and roadside nature reserves.	These are local datasets that Transport East does not have access to. However, the importance of these sites and others is recognised but note that these will need to be part of more detailed project level consideration and discussion with local partners.

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
19.Biodiversity: Nitrogen deposition	BA – refer to nitrogen deposition as a major biodiversity issue, and also poses a risk to developments impacting on protected areas.	Nitrogen deposition is highlighted as an issue and considered in the ISA and HRA but the assessment is qualitative at this high level and is not based on traffic or air quality modelling.
20.Biodiversity	SFOE opposes biodiversity offsetting due to impacts on site habitats and lack of success for habitat creation, but suggests planting wildflowers on verges which can reduce maintenance.	The hierarchy for avoiding, mitigating and only compensating through off setting following application of the hierarchy is set out in the ISA - recommendations on opportunities such as habitat creation and appropriate maintenance regimes are identified
21.Water Environment: Road runoff	BA requested greater consideration of watercourse pollutants in surface water runoff from roads, including microplastics. TAN highlight impact of microplastic pollution from vehicles in road runoff.	Pollution from road runoff will be is a considered in terms of risk and also a requirement for addressing in design. The types of pollution involved are identified – we note that there are also many other important sources of microplastic pollution.
22.Air Quality	Broads Authority requested consideration of localised air pollution from the brakes and tyres of electric vehicles.	These are noted in the baseline information
23.Landscape/T ownscape and visual: Designated areas	BA requested greater emphasis on protected designated landscapes, including the Broads (with a status equivalent to a National Park) and AONBs, and reference to the special qualities and tourism benefit of the Broads.	Greater emphasis and the relevant references have been added. A map of designated landscapes was included in Appendix A to the Scoping Report.
24.Landscape/T ownscape and visual: Local landscape character	BA and ECC - consider regional and local landscape character areas and assessments, including for the Broads, to inform the value, quality, and sensitivity of landscapes. Essex CC requested reference to 'valued' landscapes as well as designations in ISA objectives.	Regional and Broads-related assessments will be considered, but the regional scale of the ISA precludes detailed assessment of local character areas at this stage. Reference to valued landscapes is included in the ISA.
25.Landscape/T ownscape and visual: Dark skies and light pollution	BA - consider potential for light pollution impacts on dark skies (CPRE's Night Blight assessment) and landscape character, including in the Broads and other protected landscapes.	The potential for light pollution on dark skies has been included in the ISA.
26.Cultural heritage and Archaeology: Heritage at risk	Historic England requested that assets on the Heritage at Risk register are considered.	Potential impacts on Heritage at Risk assets is considered in the ISA although in terms of general risk as location information on proposals at this strategy level is limited.

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
27. Cultural heritage and Archaeology: Significance and setting of heritage assets	Historic England requested that impacts on the significance of heritage assets, including in relation to their setting, are considered in ISA objectives and criteria, and refers to their good practice advice.	Reference to significance and setting of heritage assets has been strengthened in the ISA criteria.
28. Cultural heritage and Archaeology: Non-designated heritage assets	Historic England and Essex CC requested consideration of data on non-designated heritage assets recorded on the county and unitary councils' Historic Environment Record, and the potential for unknown archaeology, and that the local authorities' conservation and archaeological advisers are closely involved throughout the preparation of the ISA.	Transport East does not have access to the HER records, and the regional scale of the TS and ISA with limited information on individual schemes precludes consideration of these local sites. The ISA will consider the risk to these interests and also highlight that potential impacts of schemes need to be assessed through EIAs for individual schemes in consultation with local authorities.
29. Material Assets and Resources: Minerals	Essex County Council requested the protection of mineral bearing land be included in Key Themes and ISA objectives, and the inclusion of Essex Waste Local Plan and Minerals Plans to PPS review.	Minerals bearing land has been included in ISA objectives. The additional plans are now included in the PPS review.
30. Natural Capital and Ecosystem Services: Mitigation and monitoring plans	ECC requested that recommendations for Mitigation and Monitoring Plan ensure measurable biodiversity net gains and ecosystem services will be achieved from transport scheme proposals, in line with emerging Environment Bill	The expected future requirements on biodiversity net gain natural capital and ecosystems services are included in the ISA recommendations in line with the Environment Bill
31. General	Suffolk Friends of the Earth (SFoE) requested a stronger definition of sustainability.	A definition of sustainable transport has been included (see section 1) and is also reflected in the strategy vision.
32. Proposed ISA Methodology: Draft ISA Objectives	BA queried the wording of the assessment methodology categories of impact, including to address negative impacts and maximise the positives.	The assessment methodology allows the identification of both potential negative impacts and positive impacts and the assessment is against the ISA objectives which are aiming to avoid or minimise impacts and provide enhancements and positive effects.
33. Proposed ISA Methodology: Draft ISA Objectives	<p><i>Population and Socioeconomics:</i> TAN requests consideration of access to jobs via active travel and public transport for those without access to a car.</p> <p><i>Equality:</i> TAN requests specific rewording to consider affordability of public transport (and access to e-bikes), and specific reference to women.</p>	Amendments have been added to ISA to incorporate comments provided to objectives, criteria or monitoring plan as appropriate.

Theme	Consultee Comments on the Scoping Report	Responses for the Transport Strategy and the ISA
	<p><i>Health:</i> TAN requests rewording to 'significantly increase' levels of active travel.</p> <p><i>Community Safety:</i> TAN requests rewording to reduce road danger for active travel.</p> <p><i>Climatic factors:</i> TAN requests schemes be assessed on ability to reduce traffic and meet climate targets in short-medium term.</p>	

4.2 Wider stakeholder engagement to develop the Transport Strategy

The development of Transport Strategy has involved significant wider engagement with the aim of ensuring that the strategy aligns with both regional ambition and local priorities, whilst contributing to national goals.

The approach to wider engagement has included the use of presentations, workshops, one-to-one meetings and an online questionnaire. Each method of engagement has proved useful in developing the strategy and has presented significant relevant feedback.

Initial engagement involved the introduction of Transport East and the developing Transport Strategy to 36 district representatives directing the relative importance of the key themes emerged (Table 4.2). One recommendation was to involve younger generations throughout the process, which was consequently actioned through a school engagement campaign.

Table 4.2: Summary of key themes identified in the Engagement Report Summary.²⁴

Stage	Key Themes and Messages
Stage 1 A- Developing Non-Transport Objectives	<p>Importance of decarbonisation and focus on electric vehicles</p> <p>New infrastructure must have minimal environmental impact</p> <p>Importance of ports and energy coast to the region's development</p>
Stage 1B – Evidence Building	<p>The role of the Transport Strategy in boosting and supporting the region's economy.</p> <p>Future transport options should be sustainable long term</p> <p>A shift to active travel</p> <p>Importance of reliable, improved public transport services</p> <p>Digital connectivity could compliment the transport sector, maximising assets and services.</p> <p>Opportunity to improve rail, while contributing to wider decarbonisation goals</p> <p>Importance of working with other Sub-national transport bodies and Transport for London to improve key corridors.</p>
Stage 1C – Exploring Future Scenarios	<p>A baseline is crucial</p> <p>Identifying rural and urban areas and the key 13 urban areas within the Region</p>
Online Public Engagement	<p>Changes of transport use and behaviour due to COVID including preference for transport type.</p>

Stage	Key Themes and Messages
	<p>Reduction in people using private cars and traditional commuting transport post COVID.</p> <p>General consensus included long term predictions of fewer journeys, reduction in public transport and increase in active travel. Importance of reliability, convenience and frequency for public transport.</p>
<p>Stage 2B – Ensuring Effective Delivery</p>	<p>Importance of decarbonisation</p> <p>Engagement of young people in the consultation of the strategy</p>

4.3 ISA Report

The draft Transport Strategy and ISA report and the draft HRA will be subject to a full public consultation and stakeholder engagement process over an 8-week period. A wide range of environmental and community organisations, local government and statutory consultees have been invited to comment on the ISA Report, draft HRA, and draft Transport Strategy and draft Investment and Delivery Programme Approach as part of the consultation.

The ISA Report is also made available to the public to comment on through access to the following <https://www.transporteast.org.uk>.

5 ISA baseline, issues and trends

5.1 Introduction

This chapter sets out the study area baseline against which changes due to the Transport Strategy proposals can be assessed. An extensive baseline review has been conducted as part of the ISA Scoping stage and updated for the ISA. It considers current conditions, existing pressures and future trends and how the baseline is likely to develop without the influence of the proposals in the Transport Strategy. Potential issues and opportunities relevant to the assessment of the Strategy are also identified.

The study area for the baseline includes the Transport East region and bordering and connected areas where there are potential pathways for impacts such as, for example, within river catchment areas and the key transport corridors between neighbouring regions.

Information used to establish the baseline is based on publicly available data sources.

The following topics have been addressed:

- Population – Section 5.2
- Socioeconomics – Section 5.3
- Equality and Diversity – Section 5.4
- Health – Section 5.5
- Community Safety – Section 5.6
- Biodiversity – Section 5.7
- Water Environment – Section 5.8
- Air Quality – Section 5.9
- Noise and Vibration – Section 5.10
- Climatic Factors – Section 5.11
- Landscape/Townscape and Visual – Section 5.12
- Cultural Heritage and Archaeology – Section 5.13
- Soil, Geology and Contaminated Land – Section 5.14
- Material Assets and Resources – Section 5.15
- Natural Capital and Ecosystem Services – Section 5.16

5.2 Population

Transport East's area covers a total area of 12,849 sq km, and comprises five Local Transport Authorities: Norfolk, Essex, Suffolk, Southend-on-Sea, and Thurrock. In 2019 the population of this area was approximately 3.5 million²⁵. The population of each local authority area and the population density are presented in Table 5.1.

Table 5.1: Population of each constituent area in the Transport East Area

Constituent Areas	Population ²⁶ (rounded)	Population Density (per sq km) ²⁷
Norfolk	907,800	169
Essex	1,489,200	431
Suffolk	761,400	200
Southend-on-Sea	183,100	4,294
Thurrock	174,300	1,064
Transport East Area Total	3,515,800	273
England	56,343,100	432

Essex has the largest population with just under 1.5 million and is approximately 43% of the Transport East population. Thurrock and Southend-on-Sea are much smaller in geographical size and therefore have a significantly smaller population compared to Norfolk, Essex, and Suffolk. Of the constituent areas, the Unitary Authority of Southend-on-Sea has the highest population density of 4,294 people

sq. km, this is significantly larger than the other counties. Norfolk and Suffolk have the lowest population density at 169 per sq km and 200 per sq km respectively. These are lower than the Transport East (273 per sq km) and England national average (432 per sq km).

5.3 Socio - economics

Multiple deprivation (intra-regional comparison)

When a cross reference to all the Index of Multiple Deprivation (IMD) Metrics is compared across the Transport East Region, there are some stark differences between Coastal areas and Rural areas (see Figure 5.1) with shows the overall IMD score for the region. Coastal areas in the region tend to have higher levels of deprivation compared to the national average across all metrics. The region's coastal resorts are reliant on seasonal tourism, with other job opportunities more limited. The general pattern shows that the least deprived areas are more clustered towards urban centres and most deprived areas are dispersed along the coast and clustered in parts of north west Norfolk and east Essex.

There is a difference between the levels of deprivation between the types of settlement across the deprivation domains, with coastal communities to be below England's average, and in the bottom 20% or 40% respectively. Within many coastal communities, there are relatively affluent neighbourhoods adjacent to some of the most deprived neighbourhoods despite similar access to key services by walking and public transport.

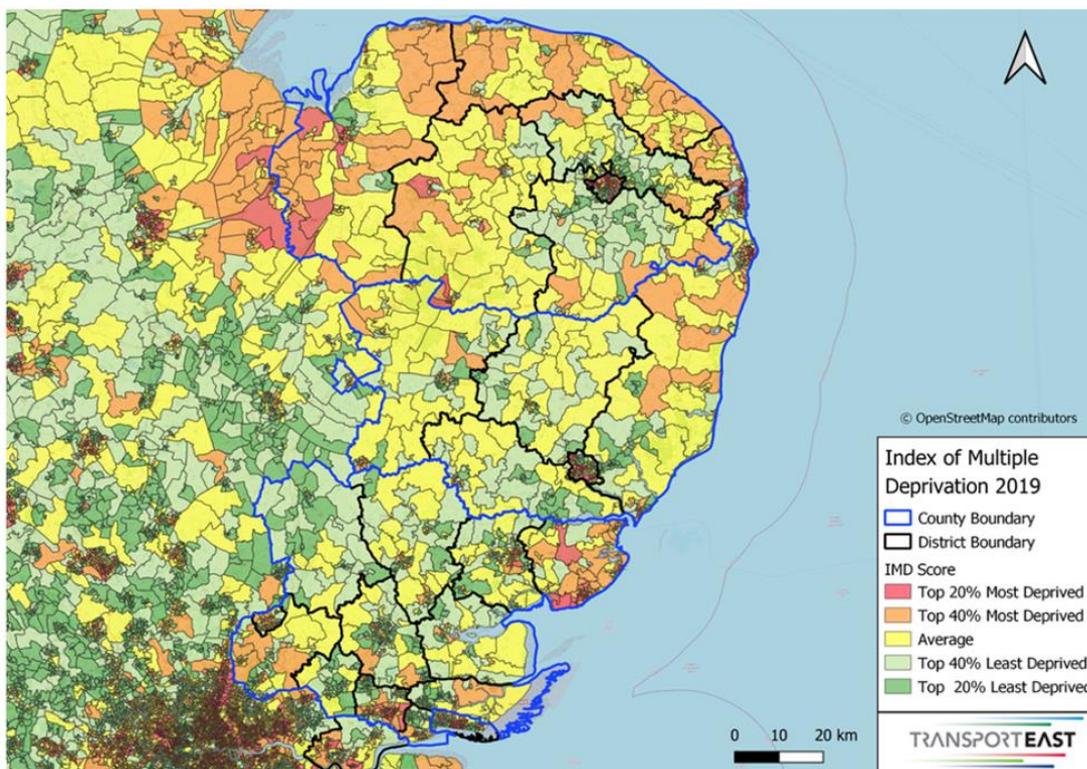


Figure 5.1: IMD scores for the Transport East Region (Source: MHCLG)

According to the 2011 census, approximately 700,000 people in the Transport East region live in coastal areas accounting for about 21% of the population. All Coastal Districts have over the UK average of 18% of over 65s with the exception of Southend-on-Sea and Thurrock with 17.8% and 12.7% respectively.

The Coastal Districts of North Norfolk and Tendring have the highest proportion of their population that are over 65 years old with 29% and 27% respectively. Coastal areas in the Region tend to have higher levels of deprivation compared to the national average across all metrics. The region's coastal resorts are reliant on seasonal tourism, with other job opportunities more limited.

According to the 2011 census, 33% of the Transport East Region live in rural areas, which is considerably higher than the national average of 18.5%. This varies considerably within the Region

with Norfolk and Suffolk more rural (50% and 40% of their populations living in rural areas respectively) than Essex (26%) and Thurrock (13%), with no rural population in Southend-on-Sea.

Within rural areas of the Transport East region, 22% of the population is over 65 years old, and 58% are between 18-65. Rural areas across the region tend to have higher levels of car ownership due to limited access to public transport and unwalkable journey times to key services. Many areas also suffer with retention issues for young graduates who are more attracted to more skilled, better paid jobs in urban areas.

In addition to coastal and rural areas, the Transport East region also comprises of a number large urban areas and settlements. A number of these urban areas experience urban deprivation to an extent, in particular Norwich with an estimated 35%²⁸ of children living in poverty, compared to the Norfolk average of 15%²⁹. Ipswich also has a number of deprivation determinants lower than the national average³⁰.

Education

Qualification data from the Census 2011 is presented in Table 5.2. The constituent area with the largest percent of no qualifications was Thurrock, closely followed by Norfolk. The proportion of people with level 1 to level 4 qualifications is broadly the same across the constituent areas. Norfolk and Suffolk had the largest proportion of apprenticeships (both 4.2%).

Table 5.2: Qualification levels across the Transport East population, 2011 (%)

Constituent Areas	No qualifications	Level 1 1-4 GCSEs	Level 2 5 or more GCSEs	Level 3 2 or more A levels	Level 4 degree, professional qualification	Apprenticeships	Other qualifications
Norfolk	26.3%	14.3%	16.2%	11.8%	21.9%	4.2%	5.3%
Essex	23.9%	16.1%	17.2%	11.6%	23.0%	3.8%	4.5%
Suffolk	24.3%	14.4%	16.5%	11.6%	23.5%	4.2%	5.5%
Southend-on-Sea	24.6%	16.4%	17.5%	11.4%	21.8%	3.0%	5.3%
Thurrock	26.5%	18.1%	17.5%	10.9%	17.4%	3.4%	6.1%

Employment and the Local Economy

In 2019, the employment rate across the Transport East area was 77.6%, similar across all authorities and is higher than the average for England (76%)³¹. Thurrock has the greatest proportion of unemployment across the counties with 5.5%, followed by Norfolk with 4.1%. The unemployment rate across the Transport East Area is 3.8%, higher than the average for the region (3.3%) but slightly less than the national average (4%). Employment is highest in the motor trades, wholesale and retail industry sectors for Norfolk (16.2%, Essex (16.4%), Suffolk (15.2%) and Thurrock (25.7%). The health sector provides the largest proportion of employment in Southend-on-Sea with 17.2%³². Table 5.3 shows the industry breakdown of employment across the Transport East area.

Table 5.3: Industry Breakdown of employment across the constituent areas, 2019³³

Industry Sector	Norfolk	Essex	Suffolk	Southend-on-Sea	Thurrock
Agriculture, forestry and fishing	2.2%	0.8%	1.5%	0.2%	0.2%
Mining, quarrying & utilities	1.2%	1.0%	1.4%	0.3%	1.5%
Manufacturing	9.2%	6.8%	9.5%	6.2%	4.5%
Construction	5.4%	7.8%	5.5%	4.7%	7.6%
Motor trades, wholesale, retail	16.2%	16.4%	15.2%	14.1%	25.7%

Industry Sector	Norfolk	Essex	Suffolk	Southend-on-Sea	Thurrock
Transport and storage	3.2%	5.1%	6.1%	2.3%	16.7%
Accommodation and food	8.4%	6.9%	7.3%	9.4%	6.8%
Information & communication	1.9%	3.4%	3.0%	2.3%	1.5%
Financial & insurance	3.5%	2.9%	2.7%	2.7%	0.9%
Property	1.6%	1.9%	1.4%	2.0%	1.2%
Professional, scientific & technical	6.2%	8.8%	6.1%	9.4%	3.8%
Business admin & support services	6.8%	8.1%	11.3%	7.8%	7.6%
Public admin & defense	4.9%	3.1%	4.0%	5.5%	3.4%
Education	9.2%	9.2%	8.2%	10.9%	9.1%
Health	15.4%	13.2%	11.9%	17.2%	7.6%
Arts, Entertainment, recreation & other services	4.6%	4.6%	4.9%	5.5%	3.0%

Gross value added (GVA) is the value generated from the production of goods and services. GVA per head on average across the Transport East area is £23,431. GVA per head is greatest in Suffolk (£25397) followed by Essex (£25318) and Norfolk (£20907). GVA per head for Southend-on-Sea and Thurrock were £17266 and £25262 respectively³⁴. The GVA for the Transport East Region is much less than the national for England which was £27,949 in 2017³⁵.

The industry sector which contributes the most to GVA across Suffolk and Thurrock is distribution, transport, accommodation, and food contributing 20% and 39% of GVA, respectively. In Norwich and Southend-on-Sea, the greatest contribution to GVA is from the public administration, education and health sectors, contributing 21% and 24% to GVA, respectively. In Essex, real estate activity contributes the largest proportion to GVA, approximately 15%³⁶.

Between October-December 2013 and October-December 2020, the number of disabled people in employment across the UK increased by 1.41 million, an increase of 47%³⁷. There were 3.5 million disabled people in work in 2017, with the Government aiming to increase this to 4.5 million by 2027.

Business Health

The business health indicator was obtained using data from the ONS on 2019 Business Demography startups and closures. All areas had a growth in business health with more business startups than closures in 2019³⁸. In 2019, Essex had the largest growth with 1,495 businesses, compared to Southend-on-Sea which had the smallest growth with only 60 businesses. Thurrock saw a growth of 430 businesses, while Norfolk and Suffolk saw a growth of 255 and 370, respectively³⁹.

Tourism

Within the Transport East Region in 2019 Norfolk had five of the most visited top 20 paid attractions in the East of England (Blickling Hall, Gardens and Park, Felbrigg Hall Garden and Park, Dinosaur Adventure, Pensthorpe Nature Reserve and Gardens and Holkham Hall). Essex had four attractions; RHS Garden Hyde Hall, Audley End Miniature railway, Audley End House and Gardens and Purfleet Heritage and Military Centre. Suffolk had three of the most visited paid attractions in the East of England; Ickworth House, Park and Gardens, Sutton Hoo Anglo Saxon Burial Mounds and West Stow Anglo Saxon Village⁴⁰.

In addition to tourism attractions, large recreational areas have become tourism hotspots. For example, there are nearly 200 nature reserves across the Transport East Region, including the Suffolk Wildlife Trust, North Cove Nature Reserve and Suffolk Coast and Heaths AONB. In addition, the Broads also attracts vast numbers of visitors each year, visiting for the unique landscape and wildlife. It is estimated to attract approximately eight million visitors per year, bringing with it, significant economic benefits for the region⁴¹.

5.4 Equality and Diversity

A baseline has been compiled using public Census data from 2011 and supplemented with more recent information where available.

Data from the Office for National Statistics (ONS) has also been gathered on the following protected characteristics from Section 4 of the Equality Act 2010:

- Age
- Sex and Gender
- Race
- Disability
- Marriage and Civil Partnership
- Pregnancy and maternity
- Religion or belief; and
- Sexual Orientation

Equality and diversity element strongly tie in with the concept of 'levelling up' introduced by the UK government in 2020. From previous assessments on the Index of Multiple Deprivation, it was observed that multiple disparities existed amongst the intra-regional areas within Transport East's area of influence. Of these, the biggest difference groups were observed to be the communities living in the rural areas and the coastal areas which are further described in the subsequent sections. Levelling up will contribute to addressing the needs of individual rural or coastal communities as each have different issues and challenges.

Age

Table 5.4 presents the split of the population across the different age ranges: Under 19s, 19 to 44 years old, 45 to 69 years old and the Over 70s. In 2019, Thurrock had a much younger population in comparison to the other areas, with the greatest proportion of under 19s (27%) and 19 to 44 year old's (35%). Thurrock also has a much smaller proportion of over 70s with 10%, compared with Norfolk and Suffolk who have 18% and 17% respectively. Accessibility to health care facilities is especially important for the older population.

Table 5.4: Age structure of the Transport East population, 2019 (%)⁴²

Constituent Areas	Under 19	19-44	45-69	Over 70s
Norfolk	20%	29%	33%	18%
Essex	22%	31%	32%	15%
Suffolk	21%	28%	33%	17%
Southend-on-Sea	23%	31%	31%	14%
Thurrock	27%	35%	28%	10%

Gender

Within the Transport East Region, approximately 49.1% of population are male and 50.9% female, which is comparable with the national male and female percentage of 49.2% and 50.8% respectively⁴³. Despite the near even split of gender of the population, the gross weekly pay (full time workers) difference between men and women are seen to be highest in Suffolk (£100.8) whilst the lowest difference is seen in Southend-on-Sea which has a difference (£45.7) lower than the national average (£78.6).

Similarly, the overall hourly pay (excluding overtime) is seen to be higher among men across the Region, with the exception of Southend-on-Sea. The hourly pay difference between gender is seen to be the highest in Suffolk (£1.42) and higher than the average national difference (£1.22)⁴⁴.

Ethnicity

Table 5.5 shows the split of the population across different ethnic groups. The largest proportion of the Transport East population stated they were white British (89.9%), this proportion was largest in Norfolk (90.8%). This proportion was much higher than the national average (78.7%). The second highest ethnicity across the Transport East area was all other white (4.4%), followed by Asian/ Asian British (2.5%).

Table 5.5: Ethnicity across the Transport East constituent Areas, 2016⁴⁵

Constituent Areas	White British	All Other White	Mixed / Multiple ethnic groups	Asian / Asian British	Black/ African / Caribbean / Black British	Other ethnic group
Norfolk	90.1%	5.6%	0.6%	2.1%	0.8%	0.8%
Essex	89.8%	3.4%	1.4%	2.6%	1.8%	1.0%
Suffolk	88.9%	5.6%	1.5%	1.9%	1.3%	0.8%
Southend-on-Sea	86.7%	5.0%	1.7%	2.8%	2.2%	1.7%
Thurrock	77.2%	6.6%	1.8%	3.0%	9.0%	2.4%
Transport East	89.9%	4.4%	1.5%	2.5%	1.9%	1.1%
England	78.7%	6.2%	1.8%	8.0%	3.5%	1.9%

Data from the latest Annual Population Survey (Jan –Dec 2019) shows that BAME women currently make up 16% of the female working age population of England and Wales. White women make up the remaining 84%. BAME men currently make up 15% of the male working age population⁴⁶.

Disability

Table 5.6 shows the proportion of the population whose day to day activities are limited by a long-term health problem or disability. The proportion of people with significant disabilities that affect their day to day across the Transport East Region (8.1%) is in line with the England average (8.3%) while Norfolk has the highest proportion of people with long term health problems or disabilities at 20.1% compared to the 17.6% England average.

Table 5.6: Proportion of the population whose day to day activities are limited by a long-term health problem or disability across the Transport East constituent Areas, 2011⁴⁷

Constituent Areas	Day-to-day activities limited a lot	Day-to-day activities limited a little	Day-to-day activities not limited
Norfolk	9.1%	11%	79.9%
Essex	7.7%	9.4%	82.9%
Suffolk	7.9%	10.1%	82.1%
Southend-on-Sea	8.8%	9.7%	81.5%
Thurrock	7.2%	8.3%	84.4%
Transport East	8.1%	9.7%	82.2%
England	8.3%	9.3%	82.4%

Religion

Table 5.7 below shows the breakdown of religious groups across the Transport East area.

Table 5.7: Religion across the Transport East constituent Areas, 2016⁴⁸

Constituent Areas	Christian	Buddhist	Hindu	Jewish	Muslim	Sikh	Other	None/ not stated
Norfolk	60.0%	0.5%	0.3%	0.3%	0.9%	*	1.6%	36.4%
Essex	58.3%	0.3%	0.8%	0.3%	1.3%	0.1%	1.4%	37.5%
Suffolk	62.8%	0.5%	0.3%	0.1%	0.9%	0.0%	1.65	33.7%
Southend-on-Sea	56.7%	0.6%	1.1%	1.7%	0.6%	0.0%	2.2%	37.2%
Thurrock	61.4%	0.6%	1.2%	*	2.4%	0.6%	1.8%	31.9%
England	56.6%	0.5%	1.7%	0.5%	5.6%	0.7%	1.5%	32.8%

* Data not available

Sexual orientation

Recent data on sexual orientation is limited, data from 2015, presented in Table 5.8 shows that the majority of the population across the constituent areas in Transport East identified as heterosexual/straight⁴⁹.

Some 48.9% of residents in the Transport East region are married or in same-sex civil partnerships, with 51.4% residents in Norfolk having the highest percentage of married couples. This overall percentage of marriages across Transport East region are seen to be slightly higher than the national at 46.8%⁵⁰.

Table 5.8: Sexual Orientation for the constituent areas, 2013 to 2015 (%)

Constituent Areas	Heterosexual or straight	Gay or lesbian	Bisexual	Other	Don't know or refuse to say
Norfolk	94.8%	0.5%	0.6%	0.3%	0.8%
Essex	96.7%	0.4%	0.2%	0.2%	0.6%
Suffolk	n/a	n/a	n/a	n/a	n/a
Southend-on-Sea	95.2%	0.6%	0.4%	0.45	1.1%
Thurrock	96.4%	0.6%	0.4%	0.3%	0.9%

Pregnancy and maternity

Table 5.9 shows that the conception rate varied across the constituent area for women aged 15 to 44. Thurrock had the highest rate with 91% while Norfolk had over 20% fewer with 69.2% in 2018. Essex, Suffolk and Southend-on-Sea were all broadly in line with the conception rate for England as a whole. Southend-on-Sea had a larger percent of Under 16 pregnancies with 5.2%, Thurrock had the least with 1.9%.

Table 5.9: Conceptions across the constituent areas, 2018⁵¹

Constituent Areas	All conceptions (rounded)	Conception rate per 1,000 women aged 15 to 44	Conceptions Under 16	Conception rate per 1,000 women aged 13 to 15
Norfolk	10,400	69.2%	38	2.9%
Essex	20,300	78.2%	47	2.0%
Suffolk	8,900	72.6%	26	2.1%

Constituent Areas	All conceptions (rounded)	Conception rate per 1,000 women aged 15 to 44	Conceptions Under 16	Conception rate per 1,000 women aged 13 to 15
Southend-on-Sea	2,600	78.9%	12	5.2%
Thurrock	3,200	91.0%	6	1.9%
England	800,200	75.7%	2,266	2.5%

Accessibility

Figure 5.2 shows the dominance of dispersed rural villages and rural towns with the ‘urban city and town’ close to, Norwich, Ipswich and Colchester. Thurrock, and Southend-on-Sea are closer to London and there is therefore a greater concentration of areas classed as ‘urban city and towns’ compared to the rest of the Region.

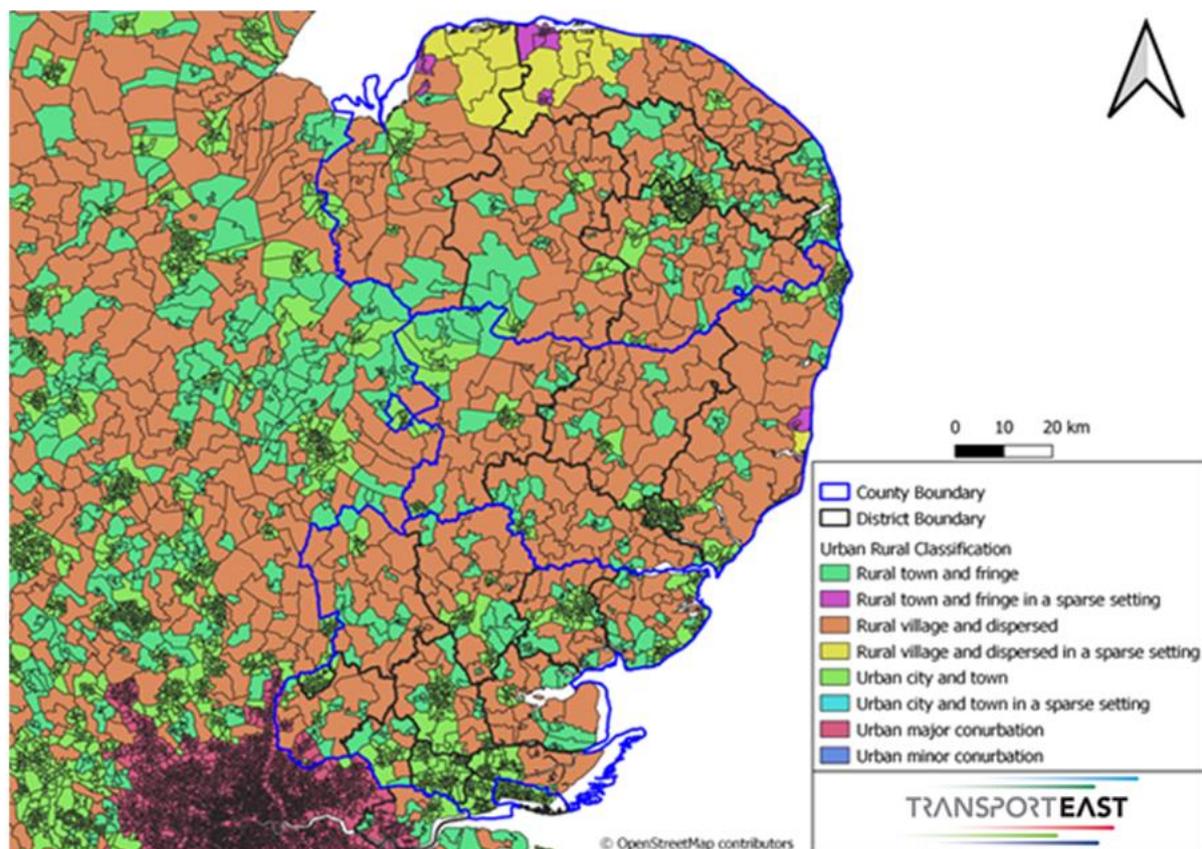


Figure 5.2: Urban / Rural area classification across the Transport East area

The characteristics of urban/rural geography of the Transport East region is shown in the Figure 5.2⁵². The focus of journey time calculations analysis has been on public transport / walking across these different urban/rural areas, to provide an understanding of accessibility that is available for the vast majority of potential users. There may be pockets of relative inaccessibility by walk/public transport, where cycling provides good access to services or transport hubs, but as often is the case, in these locations there is likely to be high car dependency. There are also groups in both rural and urban areas including those disabled or on low-income levels who are not car drivers or may not have access to a car for their daily access needs. These users are also often restricted to access by local services such as Door to Door services or Community cars which are limited to certain time periods and may need pre-booking.

Figure 5.3⁵³ shows the time taken to reach a town centre by walking and public transport, from 0 to 120 minutes. It shows that only a minority of coastal and rural communities have good access to town centres by walking and public transport. Across the Transport East Region, only 48% of the rural population can access a town centre in 30 minutes. This compares with 36% of rural Norfolk and 71% for rural Suffolk. Compared to an England average of 53%, accessibility to town centres from rural areas are low. Only 48% of residents over 65 are within 30 minutes of a town centre while only 50% of those aged between 14 and 19. There is also a need to consider journey time reliability of the transport network. In addition to reducing congestion to improve journey times, reducing demand on the road network will improve journey time reliability for users, while also benefiting pedestrians, cyclists and residents through lower volumes of vehicles and fewer air, noise and segregation issues.

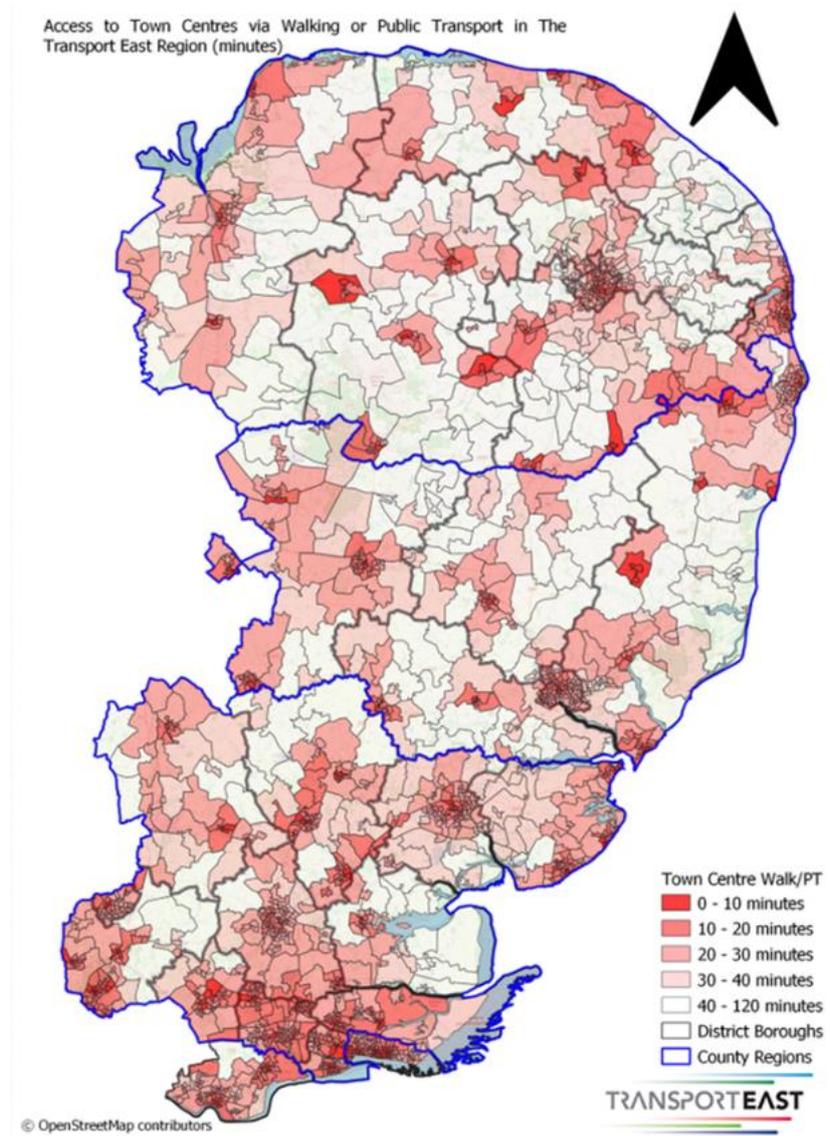


Figure 5.3: Access to Town Centres via walking or public transport

Rural areas and those who live in urban areas are more likely to not have a car in their household (see Table 5.10). Just over 43% of the households have access to one car or van, in line with the national average (42.2%).

Table 5.10: Car / van availability for households across the Transport East Area

Constituent Areas	No car / van	1 car / van	2 car / van	3 car / van	4 or more car / van
Norfolk	18.8%	44.8%	27.4%	6.4%	2.5%
Essex	18.0%	42.1%	29.6%	7.4%	3.0%
Suffolk	17.9%	43.5%	29.2%	6.8%	2.6%
Southend-on-Sea	27.3%	44.5%	22.2%	4.6%	1.4%
Thurrock	20.1%	43.9%	27.3%	6.45	2.3%
Transport East	18.8%	43.3%	28.4%	6.8%	2.6%
England	25.8%	42.2%	24.7%	5.5%	1.9%

Coastal areas are generally seen to have a higher rate of households with no car or van even if the coastal community is also rural.

Inaccessibility and loneliness, especially those residents living in households aged over 65 and those aged 16-24 years is a health consideration, however this challenge does not appear to exist beyond pockets in Norfolk’s rural towns and some coastal communities according to the ONS dataset⁵⁴. Loneliness appears to be more prevalent in more urban areas often with a correlation with the Index of Multiple Deprivation, especially in Tendring, Kings Lynn and West Norfolk, and Castle Point.

ONS data published in 2020 looked at coronavirus and loneliness and described a phenomenon of “lockdown loneliness”. Collecting more than 5,000 individual responses during the UK’s initial lockdown period (April 3–May 3, 2020), the survey found that the lockdown affected everyone asked, with 31% reported that their well-being had been impacted by loneliness. There was no link between lockdown loneliness and objective indicators such as having a health condition or disability.

Although the ONS survey included adults only, similar findings have been reported in young people. Place2Be, a UK-based organisation that provides mental health services in primary and secondary schools, found in a recent survey of over 200 frontline mental health professionals that loneliness and isolation was the most common topic discussed by young people, parents and carers during the lockdown.

Accessibility to recreational areas can encourage physical activity and provide access to nature having a beneficial effect on wellbeing, through increased opportunity for physical activity, social interaction and relaxation⁵⁵. Socially deprived communities are likely to benefit the most from the health benefits of natural environments, through reductions in stress, mortality and morbidity. Moreover, access to green space promotes community cohesion, reducing social isolation for minority groups and the elderly⁵⁶. Across the 2019/2020 period 65% of the Transport East adult population were physically active, slightly less than the 66.4% for England⁵⁷. Of adults aged 18 and above, over 62% were classified as overweight or obese, this was greatest in Thurrock (69.4%) and lowest in Norfolk (62.7%). The Transport East Region has a greater proportion of overweight or obese adults than the national average (62.8%)⁵⁸.

Key Trends

Population growth 2030 and 2040 (see Table 5.11) will see the Counties populations increasing by over 10%. Thurrock has the largest expected growth of 11% in 2030 and 21% in 2040. This increase in population will place greater demand on the transport infrastructure and network.

Table 5.11: Population Projections 2030 and 2040

Constituent Areas	2019 (rounded)	2030 ⁵⁹	% Increase from 2019	2040 ⁶⁰	% Increase from 2019
Norfolk	907,800	974,300	7%	1,017,668	12%
Essex	1,489,200	1,580,618	6%	1,647,398	11%
Suffolk	761,400	794,838	4%	819,172	7%
Southend-on-Sea	183,100	195,024	6%	203,587	11%
Thurrock	174,300	191,662	10%	202,327	16%
England	56,343,100	59,181,798	5%	61,157,868	9%

Data has also shown that ethnic diversity in the population make up across the Transport East Region is projected to increase between 20 to 40% and some areas increasing by 50 to 60%⁶¹.

Parts of the coastal communities such as North Norfolk and the former Suffolk Coastal District are projected to have over 37% of their residents over 65 by 2043^{62,63}, potentially contributing to an increase in loneliness.

Table 5.12: Population Projections by state pension age and working 2030 and 2040^{62,63}

Indicator	Norfolk	Essex	Suffolk	Southend-on-Sea	Thurrock	TE area total	England total
State Pension 2019	218,553	301,301	175,905	34,840	23,530	754,129	10,127,000
Working age 2019	538,206	905,212	448,855	112,849	110,524	2,115,646	35,393,000
State Pension Age 2030	240,920	324,374	196,600	37,618	24,950	824,462	11,211,000
% Increase from 2019	11%	9%	13%	10%	8%	9%	11%
Working Age 2030	582,383	972,378	468,940	122,399	125,073	2,271,173	37,529,000
% Increase from 2019	7%	6%	3%	7%	11%	7%	6%
State Pension Age 2040	282,504	376,518	230,975	44,933	30,339	965,269	13,209,000
% Increase from 2019	31%	27%	33%	31%	32%	28%	30%

Indicator	Norfolk	Essex	Suffolk	Southend-on-Sea	Thurrock	TE area total	England total
Working Age 2040	581,414	983,716	459,634	123,528	130,121	2,278,413	37,481,000
% Increase from 2019	6%	7%	1%	8%	16%	8%	6%

Table 5.12 shows population projection by state pension age and working age across the Transport East constituent areas for 2030 and 2040. Thurrock is the area with the highest increase from 2019 of working age population by 2030 and 2040, 11% and 16% respectively. In comparison, Suffolk is the area with the lowest increase from 2019 of working age population with only 3% for 2030 and 1% for 2040. Similarly, Suffolk is the area that is estimated to experience the highest increase of state age pension population by 2040 (33%). This is in line with the other areas within Transport East, whose state age population is predicted to increase an average of 30%.

Issues and Opportunities

Key issues and opportunities for population, equalities, and socioeconomics are:

- Population growth across all age groups will place pressure on the transport network, housing availability, amenities, education and health facilities.
- The transport network should aim to support and improve access to services and facilities for vulnerable groups including the elderly population, disabled, women, families with young children, and single parent families.
- There are opportunities to improve access to rural areas through transport services, digital services and bring services to people.
- COVID-19 has changed work habits increasing the number of people seeking to live outside the city centre, as the need to access workplaces is reduced. This may reduce daily commutes but will place different demand on transport services as more people travel into urban centres for leisure and social interaction
- COVID-19 is expected to increase staycations in the short term therefore transport infrastructure needs to be able to accommodate increased demand to coastal hotspots – an influx of tourists can create parking issues, congestion, environmental impacts e.g. litter
- Transport is a facilitator that allows efficient business and is essential for modern living. Sustainable transport interventions can support inclusive growth for communities which further helps social cohesion, access to employment and access to vital services.
- By helping disabled people into work, enables people to reach their potential and economic independence. Employers will also enjoy the advantages of a diverse workplace, the talents of disabled people and the potential for greater productivity⁶⁴.

5.5 Health

The World Health Organization (WHO) constitution defines health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’⁶⁵. Health is determined by a complex interaction between individual characteristics, lifestyle and the physical, social and economic environment. Most public health experts agree that these ‘wider determinants of health’ have a greater influence than formal healthcare for ensuring a healthy population. Figure 5.4⁶⁶ provides a conceptual illustration of wider determinants of health in our natural and built environment.

A related issue, of key importance to public health, is the issue of health inequalities. The Marmot Review into health inequalities⁶⁷ looked at differences in health and wellbeing between social groups and described how the social gradient on health inequalities is reflected in the social gradient on educational attainment, employment, income, quality of neighbourhood and other issues.

Understanding the wider determinants of health is seen as an important means of tackling health inequalities and improving population health.



Figure 5.4: Determinants of health and wellbeing in our neighbourhoods

Transport can have both positive and negative effects on health, and these effects can be distributed unequally across populations. Figure 5.5 illustrates potential pathways between transport policy and physical and mental health (including health inequalities). Physical and mental health are strongly interconnected, with physical health problems significantly increasing the risk of poor mental health and vice versa.

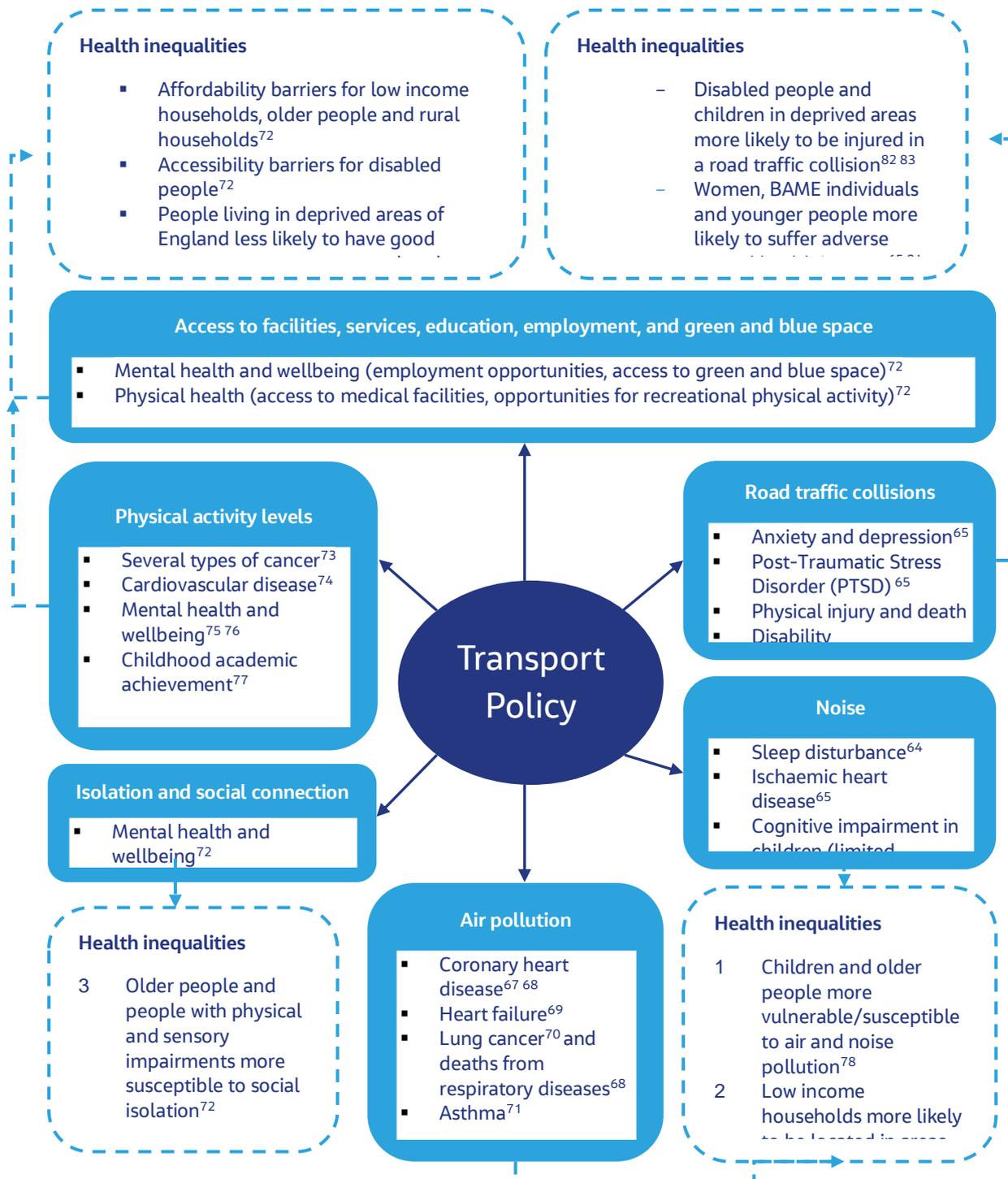


Figure 5.5: Links between transport policy and health outcomes

Whilst the Strategy has potential to alter transport patterns outside the Region, the primary health effects would happen within, rather than beyond the Region, consequently, baseline information for the Region has been derived from the following sources:

- Public Health England's (PHE) Local Authority Health Profiles webtool (<https://fingertips.phe.org.uk/profile/health-profiles>)
- PHE's Health Inequalities Segment Tool (<https://analytics.phe.gov.uk/apps/segment-tool/>)

- Suffolk County Council⁶⁸, Thurrock County Council⁶⁹⁷⁰, Norfolk County Council⁷¹, Essex County Council⁷² and Southend-on-Sea Borough Council⁷³⁷⁴ Joint Strategic Needs Assessments (JSNA)
- Transport East Regional Evidence Base⁷⁵
- Levelling up Rural and Coastal Communities evidence base⁷⁷

Table 5.13 presents key socio-demographic and health indicator data identified in Figure 5.5 as being particularly relevant to transport interventions. Data is presented at local authority level for the purposes of this scoping assessment. It is acknowledged that this will mask variation at the local level. For example, an initial review of local level data (Lower Layer Super Output Areas, or LSOA, is a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales) using PHE's Local Health webtool shows that rates of premature mortality all causes are higher in coastal towns in Norfolk, Suffolk and Essex than in other parts of the study area. At the assessment stage local level (LSOA where available) data will be obtained and reviewed in relation to specific transport interventions.

Table 5.13: Population health indicator data

Indicator	Local Authority					England average
	Essex	Norfolk	Southend-on-Sea	Suffolk	Thurrock	
Indicator data for populations particularly vulnerable to health impacts associated with transport						
Life expectancy at birth (male) (2017-2019)	80.4	80.1	79.1	80.9	79.4	79.8
Life expectancy at birth (female) (2017-2019)	83.5	84.1	82.5	84.3	82.7	83.4
Population aged under 19 (2019) (%)	See Table 5.4					18.9
Population aged over 65 (2019) (%)	See Table 5.4					18.8
Long term health problem or disability (2011) (%)	17.1	20.1	18.5	17.9	15.6	17.6
Deprivation score (IMD 2019)	See 'Multiple deprivation (intra-regional comparison)					
People aged 16-64 in employment (%) (2019/2020)	76.9	78.0	77.6	78.4	76.6	76.2
Health indicators relevant to transport						
Physically active adults (%) (2019/2020)	67.6	66.2	63.2	69.5	58.3	66.4
Adults aged 18+ classified as overweight or obese (%) (2019/2020)	63.8	62.3	65.1	62.7	69.4	62.8
Prevalence of obesity (including severe obesity) at Year 6 (%)	19.5	19.7	19.5	18.7	25.2	21.0
Physically active children and young people (%)	45.5 (East of England region)					44.9
Premature mortality rate (aged under 75) from all causes (2017-2019) (standardised rate per 1000)	300	304	353	281	329	326
Under 75 mortality rate from all cardiovascular diseases (2017-	60.7	64.7	75.5	60.3	74.5	70.4

Indicator	Local Authority					England average
	Essex	Norfolk	Southend-on-Sea	Suffolk	Thurrock	
2019) (standardised rate per 1000)						
Under 75 mortality rate from cancer (2017-2019) (standardised rate per 1000)	126.1	121.5	141.6	117.9	137.0	129.2
Emergency hospital admissions from COPD (2019/2020) (rate per 1,000)	351	341	535	327	582	416
Estimated prevalence of common mental health disorders (2017) (% of population aged over 16)	14.9	15.8	17.5	14.8	17.3	16.9
Estimated prevalence of common mental health disorders (2017) (% of population aged over 65)	9.5	10.1	10.6	9.4	10.4	10.2
Killed and seriously injured (KSI) casualties on England's roads (2016-2018) (crude rate per 1000)	54.3	47.6	43.5	39.2	49.5	42.6
Note: shaded cells indicate values that are either statistically significantly worse than the England average or are within the worst quintile for England (IMD data only)						

Table 5.14 describes the baseline for each of the six main pathways between transport policy and health identified in Figure 5.5, including evidence of health inequalities where available.

Table 5.14: Health outcomes and inequalities within the study area

Potential pathway to health impacts	Health outcomes in the study area	Health inequalities in the study area
Access to facilities, services, employment, education and green and blue space	Male and female life expectancies in Southend-on-Sea are significantly lower than the England average, and rates of premature mortality (all causes) are significantly higher. Female life expectancy in Thurrock is also significantly lower than the England average. Other leading and lagging health indicators linked to access to facilities, services and greenspace are generally similar or better than the England average.	Norfolk and Suffolk have a relatively high proportion of residents aged over 65 and with a long term health problem or disability, both to experience accessibility difficulties. King's Lynn and coastal areas in Norfolk, Suffolk and Essex in particular have a high proportion of residents with long term health problem or disability. As described in detail in 'Accessibility' (Refer to Section 5.3) only a minority of coastal and rural areas have good access to town centres and hospitals by walking and public transport, and for rural communities' access to GPs is worse than the England average ⁷⁶ .
Road traffic collisions	Three of the five local authorities (Essex, Norfolk and Suffolk) within the study area have rate of KSI casualties which is significantly higher than the England average.	Small area analysis of relationships between areas with high proportions of older people, people with a disability or high levels of deprivation and KSI casualty rates will be undertaken to support the health assessment in the ISA

Potential pathway to health impacts	Health outcomes in the study area	Health inequalities in the study area
		should relevant options taken forward to assessment
Air and noise pollution	<p>Air Quality Management Areas have been declared (where Air Quality Objectives are not likely to be achieved, due to road vehicle emissions) by 16 of the 26 local authorities in the region, and of the 46 AQMAs, 42 were for exceedances of annual mean NO₂, with four in Thurrock declared for exceedances of particulate matter (PM₁₀).</p> <p>The 46 NIAs are located mainly at major road junctions within urban areas (see 'Noise'). Rates of emergency hospital admissions for COPD are significantly higher than the England average in Southend-on-Sea and Thurrock. Respiratory diseases are the main contributor to the life expectancy gap between Southend-on-Sea and England in men and one of the main contributors for women.</p>	<p>Southend-on-Sea Joint Strategic Need Assessment (JSNA)^{104 105} recognises that there are higher levels of transport related pollution within the more deprived areas.</p> <p>Whilst coastal areas in Norfolk, Suffolk and Essex have high proportions of older residents, elevated air and noise pollution levels occur within urban conurbations.</p>
Physical activity levels	<p>Rates of physically active adults, overweight or obese adults and obese children are statistically significantly higher than the national average in Thurrock. However, data for health outcomes linked to physical activity levels (cardiovascular disease, cancer, anxiety and depression) are similar to the England average in Thurrock and across the Region</p>	<p>Data on rate of physical activity in adults and children is not currently publicly available at small area level. Small area analysis of relationships between leading health indicators and health outcomes linked to physical activity levels and levels of deprivation will be undertaken to support the health assessment within the ISA. An initial review suggests there is some correlation between deprivation and rates of premature mortality from cancer and circulatory diseases in coastal towns in Norfolk, Suffolk and Essex, and in Thurrock.</p>
Social connection and isolation	<p>The prevalence of common mental disorders (anxiety and depression) in people aged over 16 is similar to the England average across all local authorities.</p>	<p>Older people are more susceptible to social isolation, and Norfolk and Suffolk have a high proportion of residents aged over 65, particularly within coastal areas. However, health indicator data shows rates of common mental health disorders in over 65s is similar to the England average. However, levels of loneliness are generally higher in urban areas with a few exceptions such as a few rural towns in Norfolk and some coastal communities⁷⁷ (see 'Accessibility' for further detail).</p>

Key Trends

- All local authorities but particularly Norfolk and Suffolk, anticipate increases in the proportion of residents aged over 65 in the coming decades.
- Physical activity levels in some areas of Essex are declining, in contrast to the national trend.

- Rates of KSI casualties on roads in Essex and Norfolk have increased over the last decade, a trend common across the UK.
- Levels of deprivation are rising in coastal Suffolk.

Issues and Opportunities

Key issues and opportunities include:

Health protection

- Interventions which seek to reduce road traffic collisions would focus on encouraging modal shift towards public transport and active travel (see 'Health promotion' opportunities identified below), but where necessary would also include traffic calming measures such as speed limits and addressing new challenges such as from e scooters.
- Interventions reducing air and noise pollution also address inequalities in exposure to poor air quality such as within the existing AQMAs in Essex, Thurrock and Southend-on-Sea and NIAs within urban areas.

Health promotion

- Consideration of age friendly design, including design for dementia, and potential for increasing access to health services in development of transport proposals to better an older population.
- Interventions to encourage a shift towards public transport, walking and cycling which will provide benefits including air pollution and physical activity levels. These would include measures to improve the public realm within urban areas and increase public transport connectivity within rural and coastal areas, as well as provision of good pedestrian and cycling infrastructure.
- Continued support for access to recreational facilities and green and blue space, with opportunities to improve access.

5.6 Community Safety

Safety and community severance are important considerations for users accessing the transport network. In addition, safety is also an indicator of crime and the fear of crime on the network.

The statistics and terminology used in the following baseline has been derived from the Department for Transport's annual road traffic statistics. There was a total of 5,923 reported road accidents in the Transport East Region in 2020, of which 2,727 were on urban roads whilst 3,196 were on rural roads⁷⁸. The highest number of these road accidents was in Essex (2,385) whilst the lowest was in Thurrock (272).

Taking an average across the Transport East Region, 46.8 people (per 100,000 resident population) are killed or seriously injured (KSI) on the roads.⁷⁹ Suffolk has the lowest KSI at 39.2 per 100,000 population, lower than the England average of 46.7. Thurrock has the highest number of KSI at 49.5. The highest number of fatal accidents across the Transport East Region in 2020 were recorded in Essex with 38⁸⁰ while there were 98 fatal, 1513 serious, and 4,312 slight accidents across the Region in 2020.

Across England, car occupants accounted for 42% of road deaths, pedestrians 27%, motorcyclists 19% and pedal cyclists 6% in 2019⁸¹. Whilst 2019 saw an increase in pedestrians and pedal cyclists' accidents, 2020's change in travel patterns have contributed to a larger percentage reduction for pedestrians and a smaller reduction for pedal cyclists compared to other road users⁸². An impact of these collisions would be on the increased severance and perceptions of safety that active mode users have when accessing the network. Prior experience of an incident on the network is a significant factor influencing users' perceptions of safety. In the Bike Life cities survey (June 2018), both women and men believe safety for cycling needs to be improved in comparison to other transport modes. Safety is likely to include both road safety and personal safety⁸³ Road safety and perception of safety has a bigger impact on women, the Sustrans survey show that less than half of women (46%) think their city is a good place to cycle overall with adequate infrastructure, including the amount, directness, condition and signposting. Severance, perception of safety and road safety will be considered in the assessment of the strategy interventions with the aim that everyone should be able to access the network safely across the Transport East region.

A public transport survey (2020) for the Transport East Region shows that safety is among the top three categories considered 'Important' or 'Very important' when people use public transport. Further data showed that safety tends to be more of a factor for specific groups such as women and those retired and over 65 years of age. Women are also more likely to see safety as a 'very important' issue compared to men. When comparing personal security, especially on public transport services women tend to rate personal security as more important compared to men who tend to rate it of 'neutral' importance.

Transport interventions may affect the level of security for transport users. This includes vulnerability to crime both at stations and on the transport network. Different social groups have different perceptions and vulnerability to crime.

Evidence suggests that, younger people are likely to be more susceptible to crime as they have less ability to protect themselves or recognise the danger of a situation⁸⁴. Older individuals are also likely to have a greater fear of crime due to their insecurity or inability to protect themselves or withstand the effects of a crime. Moreover, the physical and mental weaknesses caused by old age make the elderly easy targets to those with criminal intent. Similarly, women's susceptibility to sexual assault and frequent experiences of various forms of harassment make them feel more vulnerable and perceive higher security risks⁸⁵

Ethnic minority groups tend to live in low-income urban areas where the risk of assault is higher. Furthermore, individuals living in deprived areas have less choice about where they live making them more exposed to crime⁸⁶.

In 2017/2018, the number of reported sexual offences committed on public transport in the UK, increased by 7.6% (over 60% of these assaults were against females). The number of violent offences increased by 16% to 13,591 in 2018/19. These trends have changed in 2019/2020 which saw recording of sexual offences decrease by 7.53% whilst violent offences still increased by 1.11%. In 2019/2020 for the Transport Police B division area North (which includes the Transport East Region in addition to Cambridgeshire) reported 248 sexual offences against females compared to 19 against men.⁸⁷

Between 2014 and 2016, the numbers of disability related hate crime incidents in England reported to the British Transport Police decreased by 37% while since 2016, the number of incidents has seen an increase of 24%.⁸⁸

Key Trends

Except for Suffolk, the number of people seriously hurt or killed on the roads is higher than the national average. As the population increases, this could lead to a greater number of vehicles on the roads with potential for increased accident risk but the demographic changes also indicate this population increase will be mainly in older age group so the number of two car households could decline and the average distance travelled could decline in some areas. There is also the general trend for declining accident rates despite increased vehicle numbers on the roads. Safer roads have contributed to this trend in the past and in the future road safety improvements and better technology in vehicle automation might be beneficial to help reduce accident rates further. New challenges include concerns over safety associated with e-scooter use.

Highways England has set a clear long-term goal to bring the number of people killed or injured on the network as close as possible to zero by 2040. It has committed that, by the end of 2020, 90% of travel on the roads for which it has responsibility will be on roads with a 3-star safety rating or better⁸⁹. In addition to this national agenda, Safer Essex roads partnership has recently launched Vision Zero as their ambition to have zero road deaths and serious injuries on roads in the Essex, Southend-on-Sea and Thurrock council areas by 2040⁹⁰. Alongside this Norfolk and Suffolk councils have teamed up with Think! and Road safety strategies to support safer travel. This could help contribute to a reduction in serious road accidents.

Issues and Opportunities

Key issues and opportunities around community safety include:

- With traffic levels reaching levels seen pre-pandemic, there is an increase in the number of accidents and casualties.

- Protection of children, particularly in deprived areas, and young people, who are greatly over-represented in the casualty statistics⁹¹.
- Fatalities on rural roads are more likely than on other road types.
- Crime on public transport in the UK particularly with regards to sexual assault, violent crimes, and disruption is increasing particularly affecting women, disabled and those from ethnic minority groups.
- Encourage the reporting of crimes as well as ensuring better safety provisions for all transport users.

5.7 Biodiversity

The biodiversity study area extends to include 2km from the Transport East Region boundary and areas with impact pathways such as where there are hydrological connections including river catchments that cross the Transport East boundary or changes to air pollution and nitrogen deposition along connecting transport corridors.

Information to inform this baseline has been gathered from multiple online sources:

- Magic Interactive Map⁹²
- Joint Nature Conservation Committee (JNCC)⁹³
- Natural England Website⁹⁴
- Norfolk Biodiversity Information Service⁹⁵
- Suffolk Biodiversity Information Service⁹⁶
- Essex Wildlife Trust Biological Records Centre⁹⁷

The distribution of statutory designated sites of international, national and local importance are presented in Appendix A: Figure 1 and are outlined below:

International/European

Sites protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) include:

- Special Areas of Conservation (SACs), designated under the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)
- Special Protection Areas (SPAs) designated under the Directive 2009/147/EC of the European Parliament and of the council of 30 November 2009 on the conservation of wild birds (the Birds Directive)
- Ramsar sites, designated to meet the commitments of the Convention on Wetlands of International Importance,
- These areas all contribute to an international network of protected sites.

There are 24 Special Protection Areas (SPAs) (Appendix C) within the biodiversity study area, predominantly associated with coastal habitats and designated for the protection of waterbirds. These SPAs cover a total area of approximately 520065 ha, of which 85.3% is marine habitat. The Outer Thames Estuary SPA, on offshore SPA covering 392,451.66 ha of marine habitat, is also within the biodiversity study area.

Additionally, there are 23 Ramsar sites (Appendix C) within the biodiversity study area, designated to protect wetland habitats, covering an area of approximately 123,141 ha.

National/Local

There are 401 Sites of Special Scientific Interest (SSSIs), 38 National Nature Reserves (NNRs) and 119 Local Nature Reserves (LNRs) (Appendix A: Figure 1). In addition to these statutory designated sites, there are more than 2300 county or local wildlife sites, including roadside nature reserves within the Transport East study area.

Within the Transport East Region boundary approximately 90% of SSSIs have been assessed as being in 'favourable' or 'favourable recovering' condition with the majority of the remaining 10% being in 'unfavourable-no change' or 'unfavourable – declining' condition

A variety of priority habitats and species (as defined in the Natural Environment and Rural Communities (NERC) Act 2006) are identified in the Region, including coastal and lowland habitats, such as coastal and floodplain grazing marsh, lowland dry acid grassland, deciduous woodland and traditional orchards. Priority species include bats, terrestrial mammals, reptiles, amphibians, insects and freshwater and marine species. (Note: Priority habitats and nature recovery sites are covered in the section on Natural Capital).

Key Trends

The 2019 State of Nature Report (State of Nature Partnership, 2019) highlighted the current trends in UK biodiversity since 1970. For England it was reported that 35% of species have experienced reductions in population, and 31% have reduced range. In comparison, 31% of species have seen increased populations and 24% have increased ranges.

Eight key drivers were identified for the changes in England's biodiversity: climate change, urbanisation, pollution, woodland management, fisheries, invasive non-native species, freshwater management and agricultural management, all relevant for the Transport East Region but particularly the latter two. The majority of sites within the Transport East Region. biodiversity study area that are designated for coastal habitat and birds report public access and disturbance as threats to qualifying features⁹⁸.

A 2020 review of UK biodiversity indicators found long-term deterioration for a number of indicators including pressure from invasive non-native species, status of threatened habitats and species, status of UK Priority species, birds in the countryside and at sea, and biodiversity and ecosystem. However, positive long-term trends including integration of biodiversity considerations into business activity, area of land in agri-environment schemes, pressure from pollution, protected areas, wintering water birds, mammals of the wider countryside (bats) and greenhouse gas removals by UK forests⁹⁹.

Recently, a focus on environmental commitments and schemes, such as the Water Framework Directive, Environmental Land Management Schemes (ELMS) and biodiversity net gain for development is seeking to halt and reverse the negative biodiversity trends. Agri-environment schemes have recently demonstrated positive associations with winter bird populations in England¹⁰⁰. Particularly significant is the pending inclusion of biodiversity net gain as a planning requirement for all developments in England as will be required through the Environment Act 2021. The Environment Act also sets out a requirement for Local Nature Recovery Strategies.

Issues and Opportunities

The Transport East Transport Strategy has the potential to affect biodiversity in both positive and negative ways. New infrastructure required to meet the aims of the strategy may result in direct loss of habitats and associated species as well as indirect effects due to pollution and disturbance, including nitrogen deposition. Designated sites already under pressure from recreational access and disturbance may be negatively affected by increased accessibility as a result of the strategy. However, the Transport Strategy may have positive effects through habitat enhancement measures as well as reduced pollution due to the decarbonisation theme.

5.8 Water Environment

The water environment baseline has been derived from the following sources:

- Water Framework Directive – River Basin Districts (Cycle 2)¹⁰¹
- Environment Agency - Flood Risk Maps¹⁰²
- Environment Agency – Catchment Data¹⁰³
- MagicMap¹⁰⁴

The study area has an extensive water environment consisting of river networks throughout the areas, estuaries on the coastline, and surface water bodies found throughout the region, and ground water aquifers. Water from groundwater and surface water sources is essential for the environment, public water supply, agriculture and industry. The different Water Framework Directive water body categories are provided in Table 5.15.

Table 5.15: Number of water bodies in the Anglian River Basin District¹⁰⁵

Water Body categories	Natural	Artificial	Heavily modified	Total
Rivers, canals, and surface water transfers	189	44	293	526
Lake	10	19	17	46
Coastal	4	1	8	13
Estuarine	3	0	15	18
Groundwater	31	0	0	31
Total	237	64	333	634

The water environment has the potential to be both directly and indirectly affected by the Transport Strategy, while the functionality and the service of the infrastructure can be affected by flooding. The construction of land-based transport can potentially contribute to pollution of nearby watercourses and groundwater.

To protect the water environment, there are nationally significant legislation and corresponding standards, established within the EU Water Framework Directive (2000/60/EC), which seeks to protect and maintain water quality standards. The Water Framework Directive (WFD) sets an objective to achieve at least 'good ecological status' for all waterbodies by 2021. Very few water bodies meet 'good ecological status' particularly in Norfolk and Suffolk (see Table 5.16).

Table 5.16: Ecological and chemical classification for surface waters* (2019)¹⁰⁶

Number of Water bodies	Ecological status or potential					Chemical Status	
	Bad	Poor	Moderate	Good	High	Fail	Good
603	22	105	428	47	0	603	0

*Anglian River Basin District data used

Table 5.17: Chemical and quantitative classification for groundwater* (2019)¹⁰⁷

Number of Water bodies	Quantitative status		Chemical status	
	Poor	Good	Poor	Good
31	14	17	15	16

*Anglian River Basin District data used

The region falls within the Anglian River Basin District, which is made up of 338 management catchments. The Anglian River Basin Management Plan¹⁰⁸ (2015), states priority issues they aim to tackle include diffuse pollution from rural areas (see landscape Section 5.11) and pollution from wastewater. It is worth noting that the current river basin management plans are due to be revised in 2021. The Region also has groundwater Source Protection Zones (SPZs), which are areas to protect drinking water sources from pollution. SPZs in the Region include Zone III (total catchment), Zone II areas (outer Protection Zone) and Zone I (Inner Protection Zone) areas.

Due to the extensive coastline and land-based water bodies, the region is susceptible to flooding and coastal erosion with consequential impacts on transport infrastructure. Road and rail infrastructure may become in-operatable due to flooding. Large areas within Norfolk and Thurrock are categorised as Flood Zone 3 (high risk) and Flood Zone 2 (medium risk) see (Figure 3 Appendix A) and Table 5.18.

Table 5.18: Flood Risk areas for Groundwater and Surface water¹⁰⁹

Flood Risk	
Ground and Sea Flood Risk	Surface Water Flood Risk
London and Thames Estuary	Canvey Island
Saffron Walden	Thurrock
Lowestoft	Chelmsford
Great Yarmouth	Colchester
Hunstanton	Ipswich
Kings Lynn	Norwich
	Harlow

The study area coastline excluding Thurrock is within Shoreline Management Plan Areas (SMPAs) and these are important for coastal management and flood protection.

Also within the Transport East area is the Broadland Catchment, covering the Broads, and also further into Norfolk and Suffolk. The Broadland Catchment includes four main rivers; the Bure, Waveney, Wensum and Yare, with the water ultimately flowing through or under the Broads and out to sea at Great Yarmouth or Lowestoft. The Broadland Catchment Partnership comprises of a range of organisations, groups and individuals, with the aim of improving the catchment utilising a Catchment Based Approach (CaBA)¹¹⁰.

Key Trends

The Water Framework Directive seeks to protect and maintain water quality standards, and where necessary highlights conditions to be improved. These standards are statutory requirements, and therefore water quality should continue to improve. This is reflected in the objectives for surface water bodies for the Anglian River Basin District, which aims to have 176 water bodies achieving good ecological status by 2027 (compared to the 47 in 2019). However, with pressure for urban development rising, the impact on poorly managed construction may result in increased pollutants within water bodies.

The Environment Agency reports¹¹¹ that urban and transport pollution sources are among the main activities that prevent water bodies reaching good status - agriculture and rural land management (31% of reasons for water bodies not achieving good status), the water industry (28%), and urban and transport (13%). Runoff from roads can pollute watercourses when pollutants from oil spills and vehicle tyre and brake wear build up and are washed into nearby rivers when it rains. Vehicle tyre wear is the largest source of plastic entering UK waters and is also estimated to account for approximately 30% of all microplastic pollution in the worlds oceans¹¹². Road runoff can carry over 300 different pollutants including trace metals, hydrocarbons and other organic pollutants which also pose a threat to river health in the short and longer term, and in extreme cases can cause 'fish kills'.

A recent study of major roads in outer London¹¹³ found that all the roads assessed had a high potential for damaging river health, and recommended the use of sustainable drainage systems (SuDS) at the roadside (close to the sources of pollution), and wetlands downstream, to use natural vegetation to capture and treat road runoff pollutants before they enter rivers or surface water sewers. The Broadland Catchment Partnership have identified that at times, some groundwater and river sources exceed drinking water standards for nitrate and pesticides. This increases the need for treatment and can therefore be costly.

Due to climate change and isostatic change the sea level continues to rise affecting the region. Sea level rise can also result in saline intrusion into groundwater which, combined with over abstraction, may result in reductions in groundwater quality. Other notable trends is that of increasing extreme weather events, and consequently flood risk and droughts.

Issues and Opportunities

Transport East Transport Strategy has the potential to negatively affect the water environment as new infrastructure may increase water pollution and affect flood risk while also offering an opportunity to potentially increase the resilience to flooding. There is also the opportunity to incorporate SuDS and wetlands in scheme design to reduce river pollution from road runoff.

5.9 Air Quality

The Air Quality baseline has been derived from the following sources:

- Clean Air Strategy (2019)¹¹⁴
- Road to Zero strategy (2018)¹¹⁵
- Clean Growth Strategy (2017)¹¹⁶
- UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (2017/18)¹¹⁷
- DEFRA/DfT, 2017. Air Quality Plan for tackling roadside nitrogen dioxide concentrations in Eastern¹¹⁸
- DEFRA, UK Air Information Resource, AQMA¹¹⁹

Poor air quality contributes directly to ill health, with elderly people and those with health conditions such as asthma and heart disease being more at risk. Deposition of nitrogen oxides can change soil chemistry and affect biodiversity in sensitive habitats. In addition, ozone, formed when volatile organic compounds react with other air pollutants in the presence of sunlight, can travel long distances from its source and trigger asthma attacks and other respiratory problems as well as damage to crops.

The UK Government's Clean Air Strategy (DEFRA, 2019) reports that road transport, domestic shipping, aviation and rail are responsible for a significant proportion of air pollutant emissions - 50% of nitrogen oxides (NO_x), 16% of fine particulate matter (PM_{2.5}) and 5% of non-methane volatile organic compounds (NMVOCs). Road transport is the largest source of nitrogen oxides in the UK and is the main source of exposure at the roadside, as well as producing particulate matter and VOCs. Airports also have an adverse effect on air quality from surface access via road transport and also on stratospheric ozone. The region is host to one major international airport at London Stansted and two small international airports at Norwich International and London Southend. The region is host to several major ports on the Suffolk and Essex coastline, including Felixstowe, the UK's busiest container port where shipping is a contributor to SO₂ and NO_x emissions.

Legally binding air quality objectives (AQOs) have been established in the UK based on European law, to limit outdoor exposure to a range of air pollutants, as set out in the UK's Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007). The UK Clean Air Strategy (2019) outlines further actions the Government is taking to tackle emissions. The UK plan for tackling roadside nitrogen dioxide (2017) produced regional Zone Plans, including for the Eastern zone, which examined air quality in the Transport East area and adjacent counties to the west and parts of London. The Plan required local authorities to prepare feasibility studies to deliver NO₂ concentration compliance in the shortest possible time, including Southend-on-Sea Borough Council in 2018.

Local authorities are responsible for monitoring and assessing air quality in their areas, and where AQOs are not likely to be achieved, they must declare Air Quality Management Area (AQMA) and prepare an Action Plan to tackle the issue. AQMAs are mainly declared where nitrogen dioxide (NO₂) levels from road vehicles exceed the AQO.

Across the region, 16 of 26 of authorities have declared AQMAs. Of the 46 AQMAs, 42 were for exceedances of annual mean NO₂, with four in Thurrock declared for exceedances of particulate matter (PM₁₀). AQMAs have been declared in the following council areas: Thurrock (18 AQMAs); Southend-on-Sea Borough (1); 12 in Essex districts: Colchester (3), Brentwood (3), Chelmsford (2), Uttlesford, Maldon, Epping Forest, and Rochford; 11 in Suffolk: Ipswich (5), West Suffolk (3), East Suffolk (2) and Babergh; and 4 in Norfolk: King's Lynn and West Norfolk Borough (2), Norwich City, and Breckland (see Appendix A: Figure 2).

Key Trends

Air quality has improved across the UK in recent years. Emissions of nitrogen oxides fell by 27% between 2010 and 2016 and are also at their lowest level since records began (DEFRA, 2019). The first UK lockdown for the Covid-19 pandemic in early 2020 led to a substantial improvement in air quality in major cities due to sudden reductions in road and air traffic. Ozone levels however are expected to require longer term changes before reduced levels are measured. The question remains whether this will be sustained when lockdown restrictions are fully eased. Nevertheless, poor air quality remains a significant issue for public health.

The UK Government has adopted more stringent legally binding ceilings for national emissions of air pollutants for 2020 and 2030 and has published proposals to tackle emissions in the Clean Air Strategy (2019), the Road to Zero strategy (2018), a plan for tackling roadside nitrogen dioxide concentrations (2017/18), and the Clean Growth Strategy (2017) which sets out measures to reduce air pollutant emissions from the transport sector. These policies include:

- increasing the use of electric and other low emission vehicles (as electric vehicles have zero exhaust emissions at street level; however even electric vehicles emit particulate matter from road, tyre and break wear)
- ending the sale of new petrol and diesel cars and vans by 2030
- encouraging and facilitating more active forms of travel (walking and cycling)
- encouraging a shift to public transport (including through the National Bus Strategy for England (March 2021) and
- introducing low emission buses and electric trains
- shifting passenger and freight traffic from road to rail
- adoption of Clean Air / Low Emission or Ultra Low Emission Zones

However, these improvements could be countered by general increases in road, shipping and air traffic. Transport projects can affect air quality through increased vehicle traffic on new or dualled roads, or increased train capacity on rail lines. Vehicle and train engines are a contributor to air pollution through the emission of nitrogen oxides (NOx), which has potential to result in significant effects on biodiversity as well as posing an economic risk as previous developments have been halted due to nitrogen levels in protected areas.

Issues and Opportunities

The Transport Strategy can support national and local policies to reduce air pollutant emissions from road, rail, and ports, in conjunction with similar policies and interventions supporting those above.

5.10 Noise and Vibration

The noise and vibration baseline has been derived from the following web sources:

- Environmental Noise Directive (2002/49/EC)¹²⁰
- Extrim – Noise and Air Quality Viewer¹²¹

Noise is considered as any additional unwanted sound, which has the potential to cause harm to human and ecosystem health. Transport is the largest contributor to noise pollution in the UK¹²², and therefore should be considered when developing the strategy, to minimise the potential for harm to human and ecosystem health (see Section 5.4). Due to these effects the EU Environmental Noise Directive (2002/49/EC) introduced strategic noise mapping and noise Actions Plans. The Transport East region has a number of major infrastructure routes including road and rail, in close proximity to urban areas (See Appendix A: Figure 2). To reduce this impact, Noise Important Areas (NIAs) have been introduced in areas where transport noise is considered to be a problem.

Within the Transport East Region, there are more than 100 NIAs, all located around major road infrastructure, particularly the A12, A13 and A127. In addition to this, there is significant noise around transport connection hubs such as ports and airports. Both noise and vibration can also occur as a result of rail transport, including freight.

Beyond high noise areas, tranquil areas are where there is peace, quiet and calm¹²³, which is often referred to within planning and policy documents as something to be protected or achieved. Tranquil areas are likely to be far from major transport infrastructure, in rural areas.

Key Trends

Due to both an increasing population and the preference of road use as a primary form of transport, car usage may increase and with increased road usage, urban areas and holiday destinations may experience increased congestion. However, improved vehicle technologies such as hybrid and electric cars, are quieter than conventional vehicles, so may also contribute to a reduction in general transport noise although at higher speeds when tyre noise dominates benefits may be more limited. Travel pattern changes due to the COVID-19 pandemic and related restrictions, showed an initial decline in road, rail and air transport. However, the long-term travel behaviour changes are difficult to predict. Over the last 20 years, tranquillity mapping produced by CPRE¹²⁴, demonstrated a long-term trend of a reduction of tranquil areas, which therefore should be considered by the Strategy as something to protect.

Issues and Opportunities

With an increasing and more elderly population and road usage previously discussed, there is the potential for the Transport Strategy to increase noise pollution. Equally, it could look to decentralise and reduce congestion in urban areas, as well as promote active lifestyles. Under the multi-centred growth key theme, the promotion of walking and cycling, which with the vehicle technology changes could contribute to reducing noise and vibration particularly in close proximity to the identified NIAs, although within limits as tyre noise is a more dominant source of noise than engine noise at higher speeds. Also identified within the baseline, is the exposure to noise and vibration as a result of rail transport. This provides an opportunity to consider measure which may help to mitigate this such as choice of train, technology, stations and noise barriers. This will require further consideration during the assessment.

5.11 Climatic Factors

The climatic factors baseline is derived from the following sources:

- Met Office¹²⁵
- Reports from the UK Department for Business, Energy and Industrial Strategy, UK Committee on Climate Change, IPCC¹²⁶

The climate of the Transport East Region is generally mild and dry. It is one of the driest regions of the UK, with many areas receiving less than 700mm of rainfall a year. Hours of sunshine are higher towards the coast. This is also one of the more sheltered parts of the UK, although sea breezes are an important feature of the weather in late spring and summer. Mean annual temperature over the region varies from around 9.5 °C to just over 10.5 °C (compared to a UK average of between 7 and over 11 °C, and some of the UK maximum temperature records are held by stations in the region.¹²⁷

Managing climate change has been defined as one of the two key challenges of this century¹²⁸. The UN Intergovernmental Panel on Climate Change has found that anthropogenic greenhouse gas emissions (principally carbon dioxide and methane, but also nitrous oxide and fluorinated gases) and other human activities are estimated to have caused approximately 1°C of global warming above pre-industrial levels, and that global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate¹²⁹.

More recently, the IPCC has finalised the first part of the Sixth Assessment Report, *Climate Change 2021: The Physical Science Basis*¹³⁰ which address the most up-to-date physical understanding of the climate system and climate change.

In 2019, total UK greenhouse gas emissions were 45% lower than in 1990 and 3.6% lower than 2018. Transport is now the largest sector source of UK domestic greenhouse gas emissions, almost entirely through carbon dioxide emissions, with 122 MtCO₂e, 27% of the total, in 2019 (BEIS, 2021)¹³¹. Emissions from transport fell (by 1.8%) in 2019 for the second year in a row, despite an increase in road traffic. Road transport is the most significant source of emissions in this sector, dominated by passenger cars (67.7 MtCO₂e), followed by HGVs (19.5 MtCO₂e) and light duty vehicles (19.2 MtCO₂e), with national shipping (5.5 MtCO₂e), buses (3.1 MtCO₂e) and railways (1.7 MtCO₂e) much smaller sources. Domestic transport emissions are only 4.6% lower than in 1990, with increased road traffic largely offsetting the improvements in vehicle fuel efficiency. In 2019 based on fuel supplied

from UK bunkers, emissions from international aviation fuel use were estimated at 37.0 MtCO_{2e}, a rise of 1% from 2018, and emissions from international shipping were 7.5 MtCO_{2e}, a fall of 4.8%.

In the Transport East Region, transport was the highest emitting sector in 2018, responsible for 41% of emissions (7,667 kt CO_{2e}), 96% from road vehicles. Emissions have increased since 2010 contributing approximately 5% of UK transport emissions (see Transport East *Decarbonisation Evidence Base and Strategic Recommendations Report*¹³²). The Region is however, one of the largest low-carbon energy producers in the UK, from nuclear power and offshore wind, and has potential to contribute to the decarbonisation of the UK electricity supply.

The Transport East Region is likely to become warmer and drier generally, with hotter, drier summers and heavier bursts of rainfall increasing localised flood risks, which transport infrastructure will need to accommodate. The risks comprise:

- Flooding and exposure to high temperatures and heatwaves
- Water shortages
- Damage to wildlife and natural ecosystems,
- Damage to soils
- Sea level rise and coastal erosion
- Loss of food production and trade
- Pests and diseases¹³³.

Global agreements and national commitments are attempting to limit greenhouse gas emissions. The Kyoto Protocol in 2005 first committed the UK to reduce emissions by 12.5% over the period 2008 to 2012, and the Climate Change Act 2008 set a legally binding target to reduce emissions to 80% of 1990 levels by 2050. The UK was subsequently one of 195 signatories to the historic 2015 United Nations Paris Agreement which seeks to achieve significant reductions in greenhouse gas emissions to avoid the worst effects of climate change by limiting global warming to well below 2°C and pursue efforts towards 1.5°C.

In June 2019 the Climate Change Act 2008 (2050 Target Amendment) Order 2019 required at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) by 2050 (the 'net zero' target). The Government's Sixth Carbon Budget (April 2021) commits the UK to reduce emissions by 78% by 2035 compared to 1990 levels, and incorporates the UK's share of international aviation and shipping emissions¹³⁴.

Measures to reduce greenhouse gases have been made by the Committee on Climate Change¹³⁵, the UK Climate Assembly¹³⁶ and the UK Government's *Decarbonising Transport: Setting the Challenge* report¹³⁷ and *Decarbonising Transport: A Better, Greener Britain* published July 2021.¹³⁸

The recently published *Decarbonising Transport: A Better, Greener Britain* includes a number of commitments to decarbonise transport. The following commitments were included:

Part 2a:

- Increasing cycling and walking
- Zero emission buses and coaches
- Decarbonising our railways
- A zero emission fleet of cars, vans, motorcycles, and scooters
- Accelerating maritime decarbonisation
- Accelerating aviation decarbonisation
- Any additional guidance or commitments published following the recent COP26 in Glasgow will be considered where relevant to the Strategy.

Key Trends

There is increasing local political will to tackle climate change, as evident Babergh, Breckland, East Suffolk, Ipswich, Mid Suffolk, North Norfolk, Norwich, Suffolk, Thurrock and West Suffolk councils have declared climate emergencies¹³⁹, while some of which have made commitments to work towards net zero emissions by 2030. Others have aimed for carbon neutrality at a later date, a key aim of the Net Zero: Making Essex Carbon Neutral plan.

Public concern about climate change remains high. In the latest BEIS Public Attitudes Tracker (March 2021), 80% of the public said they were either very concerned (33%) or fairly concerned (47%) about climate change. Transport choices were also among the top three behaviours expected to have the largest impact on tackling climate change - everyone choosing to walk, cycle or use public transport more instead of using a car (49%) and everyone driving an electric or hybrid car (35%).

In 2020, greenhouse gas emissions fell due Covid-19 pandemic (7% globally and by 13% in the UK)¹⁴⁰. A key challenge will be to sustain reductions in emissions after Covid restrictions are lifted.

The Transport East *Decarbonisation Evidence Base and Strategic Recommendations Report* (November 2020) examines trends including business opportunities for sustainable economic growth and the need for R&D, innovation and legal support to develop new and improved carbon reduction practices and technologies. It also notes:

- electric vehicle (EV) use is increasing assisted by an increasing number of public EV charging points (568 at the last count);
- plans for local low emission public transport projects including electric buses and light rail;
- new railway lines into deep-sea container ports to enable movement of freight by rail rather than road, and other ports are also investing in electrification and decarbonisation.

Issues and Opportunities

As the highest greenhouse gas emitting sector, transport in the region has the opportunity to play a significant role in reducing greenhouse gas emissions, in line with the UK's international commitments and national targets. Key recommendations and opportunities are set out in Transport East's *Decarbonisation Evidence Base and Strategic Recommendations Report* (November 2020), the Committee on Climate Change's Net Zero report¹⁴¹, the UK Climate Assembly report¹⁴² and the *DfT's Decarbonising Transport - Setting the Challenge report* (2020)¹⁴³. Transport East has the opportunity to deliver change by:

- Reducing the need to travel by diesel and petrol vehicles;
- Accelerating a shift from the private car to active transport (walking and cycling) and to improved low-carbon public transport (electric buses and trains);
- Decarbonising road vehicles, including increasing the uptake of electric vehicles;
- Tackle emissions from ports and airports;
- Understanding what works where - place based solutions;
- Supporting research and development for green transport technology and innovation;
- Delivering resilience to climate change.

5.12 Landscape/Townscape and Visual

The landscape/townscape baseline has been derived using the following web sources:

- MagicMap¹⁴⁴
- Natural England¹⁴⁵
- Nationaltrails.com¹⁴⁶
- Landscapes for Life¹⁴⁷
- Landscape East¹⁴⁸
- CPRE Night Blight¹⁴⁹

The landscape and townscape of the Transport East region is diverse. As seen in Figure 4 (Appendix A), beyond Norwich, Ipswich and Colchester the region is largely rural with many smaller villages and three Areas of Outstanding Natural Beauty (AONB):

- Dedham Vale
- Suffolk Coast and Heaths
- Norfolk Coast

Extension of the Suffolk Coast and Heaths AONB by an 38km² into Essex was announced in July¹⁵⁰. The Stour Valley is a prospective AONB.

In addition to the three AONBs, the Norfolk and Suffolk Broads can also be found within the TE Region. The Broads has status equivalent to a National Park, due to its unique landscape, wildlife and culture and is made up of over 60 open areas of water¹⁵¹. The Brecks is also considered particularly sensitive on the basis of its open and gently undulating character and is identified as a nationally distinctive landscape.

National trails include: The Peddars Way and Norfolk Coast Path run from Knettishall Heath Country Park in Suffolk, to Holme next the Sea in Norfolk¹⁵². The Region also has 124 long distance paths¹⁵³, for example, Nelsons Way, a 650km beginning in Burnham Thorpe, Norfolk.

Living landscapes is a vision shared by local wildlife trusts, with the aim of restoring, recreating and reconnecting habitat. Norfolk Wildlife Trust have identified 6 priority living landscapes within the county boundary, and Essex Wildlife Trust have identified 80 areas to improve over the next decade. Suffolk Wildlife Trust have also identified areas for living landscapes.

The Region comprises 14 National Character Areas¹⁵⁴ (NCAs) consisting of a variety of landscape types (see Figure 5.6 and Table 5.19):

- North West Norfolk
- East Anglian Chalk
- North Norfolk Coast
- Mid Norfolk
- The Brecklands
- The Fens
- South Suffolk and North Essex Claylands
- South Norfolk and High Suffolk Claylands
- Central North Norfolk
- Suffolk Coast and Heaths
- Northern Thames Basin
- Greater Thames Estuary
- The Broads; and
- North East Norfolk and Flegg

Table 5.19: Landscape Character Types in the Transport East Region¹⁵⁵

Landscape Character Type	Description	Location
Broadland Marshes	Low lying wetland	East Norfolk
Chalk Hills and Scarps	Chalk hills incised by dry valleys	Predominately outside the TE region but is found in west Suffolk
Coastal Dunes	Sand dunes	North and east coastline
Coastal Levels	Marshland	East and north coast
Forested Estate Sandlands	Conifer plantations, arable land and remnant heaths	Found mainly in the Brecks of Norfolk and Suffolk
Lowland Settled Claylands	Coastal farmland	Southern Essex, Thurrock
Lowland Settled Farmlands	Settled agricultural landscape	North east Norfolk, Southern Essex, Thurrock
Lowland Village Chalklands	Low lying arable landscape	Central/west Norfolk
Lowland Village Farmlands	Low lying landscape	West Norfolk
Planned Peat Fen	Low lying, dark peaty soils	South west Norfolk and north-west Suffolk
Planned Silt Fen	Engineered open landscape	West Norfolk

Landscape Character Type	Description	Location
Plateau Estate Farmlands	Arable landscape	Norfolk and north-east Essex
Saltmarsh and Intertidal Flats	Natural habitats of saltmarsh and intertidal mudflats	North Norfolk coast and east tidal creeks
Settled Chalk Valleys	Chalk valley landscape, often soft rounded topography	North-west Essex
Settled Marsh	Flat, intensively farmed arable landscape	West Norfolk
Settled Plateau Claylands	Extensive, elevated plateau landscape	North Suffolk and South Norfolk
Valley Meadowlands	Low lying valley floors	North Norfolk
Valley Settled Farmlands	Settled, busy landscapes	Extending from Chelmsford to Fakenham
Wooded Hills and Ridges	Varied and textured landscape	Essex
Woodland Peat Fen	Poorly drained wetland	Norfolk and Suffolk
Wooded Plateau Claylands	Ancient wooded landscape of arable farms	Norfolk, Suffolk, Essex
Wooded Plateau Farmlands	Enclosed landscape	North Essex and south-west Suffolk
Note: Shaded cells indicate dominant Landscape Character Types within the Transport East region		

Coastal landscapes are particularly important in the region and are recognised in the local coastal heritage designations (see cultural heritage section 5.13 also).

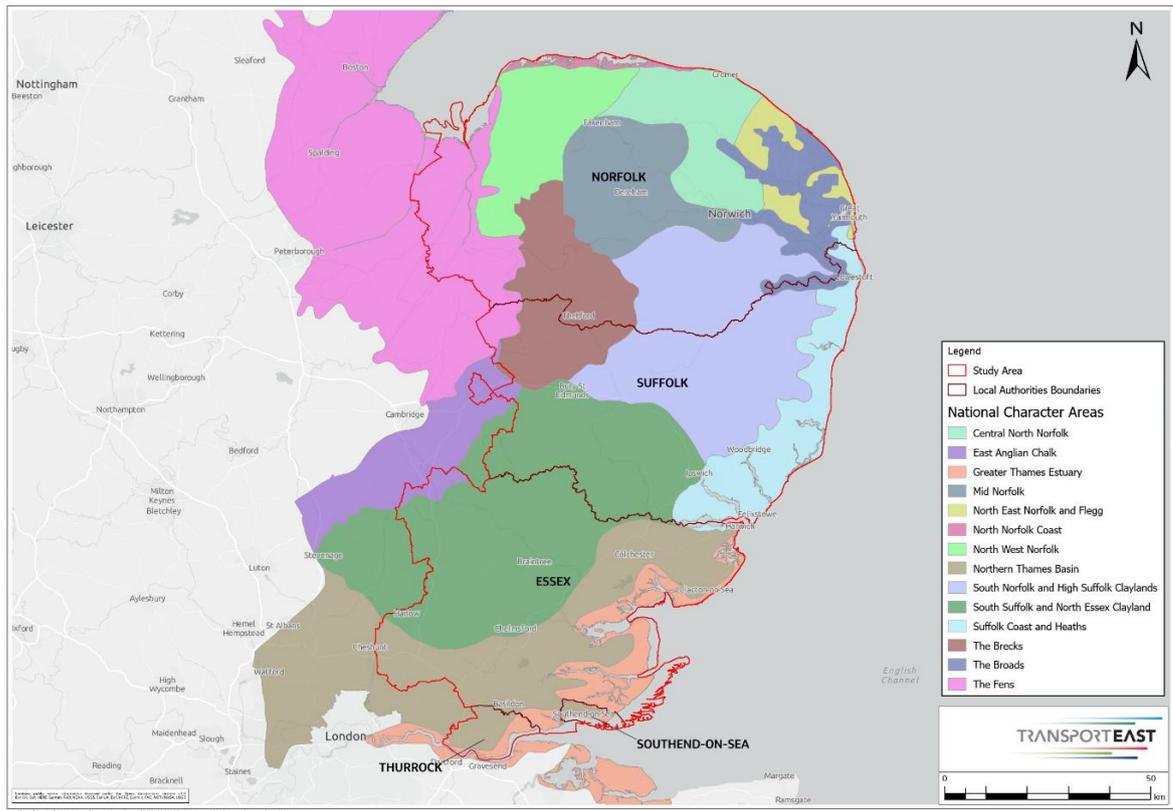


Figure 5.6: National Character Areas

In addition to landscape character, the landscape baseline also considers the presence of light pollution and dark skies. The CPRE’s Night Blight report¹⁵⁶ finds the East of England (which includes the Transport East region) to be the second darkest region at night in England. Online mapping shows considerable darker sky areas in the rural and coastal parts of Norfolk, Suffolk, north west and coastal Essex away from major settlements, including in the Broads and AONBs, and the highest levels of light pollution in the urban areas of southern Essex, Southend-on-Sea, Thurrock, Felixstowe, Ipswich, Lowestoft, Great Yarmouth, Norwich and along the A12 corridor in Essex, largely due to street lighting.

Local landscape designations and local landscape character assessments are also recognised as important sources of baseline information along with sustainability appraisals for local plans. This information is not available for mapping regionally. Registered Parks and Gardens have important landscape as well as heritage value and are included with the cultural heritage baseline.

Key Trends

The current landscape is subject to pressure from climate change, urbanisation and intensive agricultural practices. There are noted to be a number of proposed Nationally Significant Infrastructure Projects (NSIPs) in the region which potential landscape impacts. Designated area policies will provide protection against some pressures, but they are vulnerable to recreational and agricultural pressures. In the future there could be landscape benefits from the implementation of the new agricultural and environmental support through Environmental Land Management Schemes (ELMS).

In July 2020 it was announced that the Suffolk Coast and Heaths AONB is due to be expanded by an additional 38km², extending the designated area to across county borders and into Essex¹⁵⁷.

Issues and Opportunities

A key theme of the draft Transport Strategy is improving rural and urban connectivity, and therefore improved access to rural assets could result in negative impacts on landscape features the absence

of effective management. The draft Transport Strategy also refers to promoting healthy lifestyles and improved access to trails which may also require active management. New infrastructure may adversely affect landscape quality, and light pollution levels, including the character and visual amenity of areas beyond designations. There are also opportunities to control and reduce the upward light spill from street and road lighting in new infrastructure schemes in accordance with good practice guidance¹⁵⁸.

5.13 Cultural Heritage and Archaeology

The cultural heritage and archaeology baseline mapping has been derived using the following:

- MagicMap¹⁵⁹
- Historic England¹⁶⁰

While there are not any UNESCO World Heritage Sites in the Region, other designated cultural assets exist. For example, the Region has 1093 scheduled monuments protected under the Ancient Monuments and Archaeological Areas Act 1979. There are 1,218 Grade 1 and 37,422 Grade 2 listed buildings designated due to their special architectural and historic features and protected under the Planning (Listed Buildings and Conservation Areas) Act 1990. Figure 5.7, Figure 5.8 and Figure 5.9 show the distribution of heritage assets in Essex, Thurrock and Southend-on-Sea, Norfolk and Suffolk respectively.

There is one registered battlefield (Battle of Maldon, 991) protected under the Historic Buildings and Ancient Monuments Act 1983 (as amended) and 116 Registered Parks and Gardens, for which the NPPF requires consideration of their conservation value.

Finally, the Region exhibits two non-statutory Heritage Coast designations in North Norfolk and Suffolk that are protected under the NPPF.

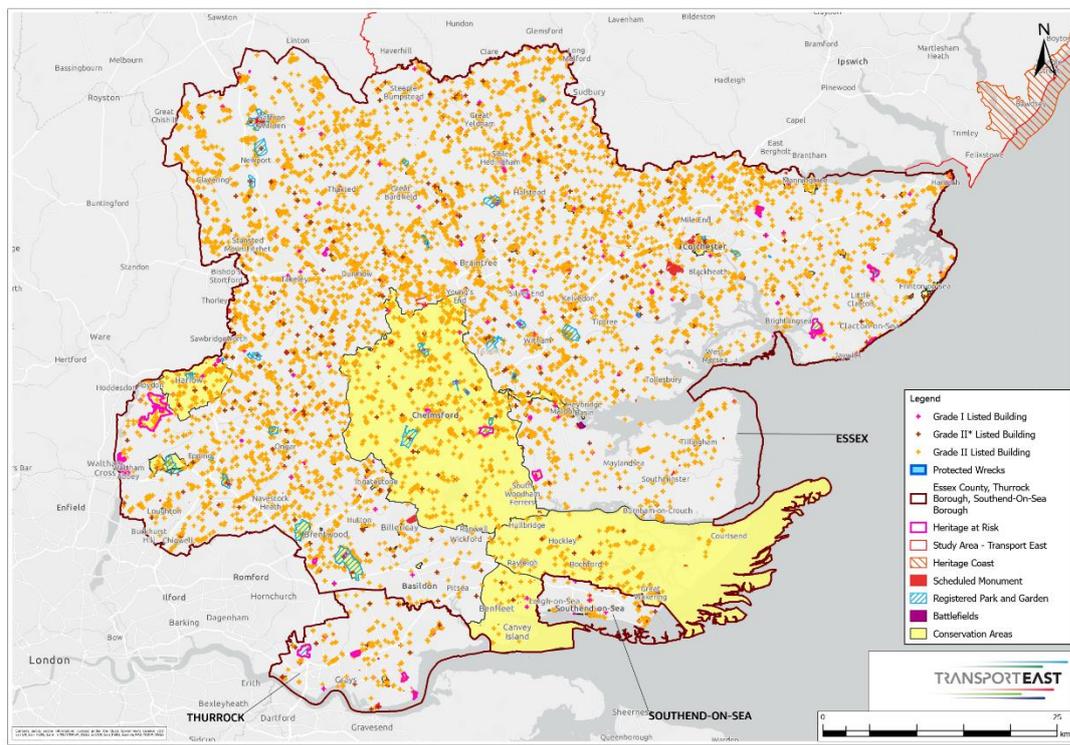


Figure 5.7: Heritage assets in Essex, Thurrock and Southend-on-Sea

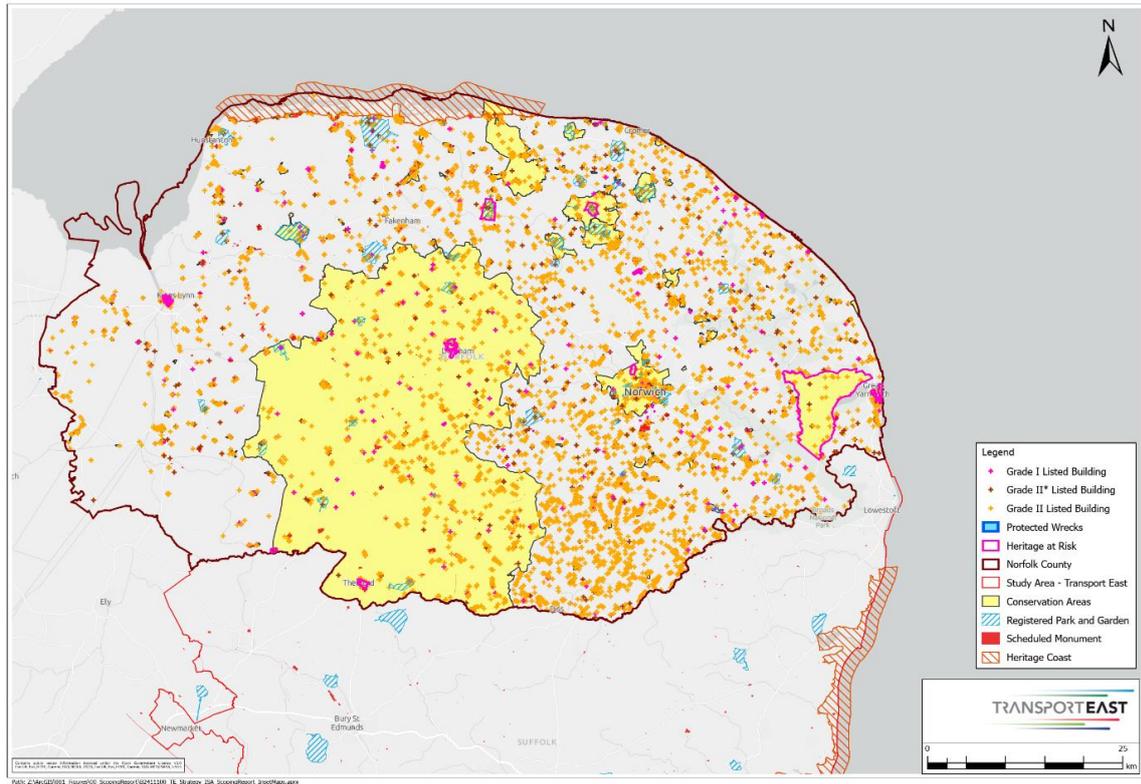


Figure 5.8: Heritage assets in Norfolk

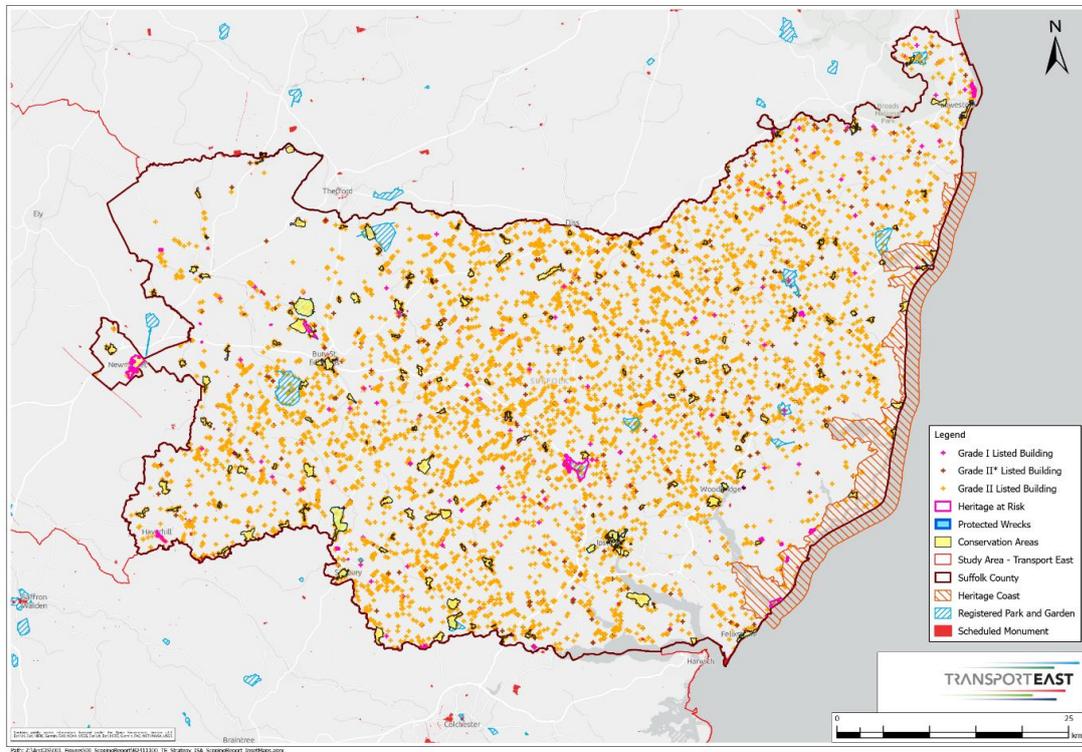


Figure 5.9: Heritage assets in Suffolk

There are 618 Conservation Areas, defined as ‘areas of special architectural or heritage interest, the character or appearance of which it is desirable to preserve or enhance’ within the Region (see Table 5.20).

Table 5.20: Conservation Areas within the TE region*

Constituent Areas	Conservation Areas
Norfolk	234
Suffolk	173
Essex	190
Southend-on-Sea	14
Thurrock	7
Total	618

*Data on numbers of Conservation Areas unavailable for the districts of Colchester (Essex) and Breckland (Norfolk)

There are also significant archaeological and paleo-archaeological interests, including potential and unknown interests in the region which can be affected by infrastructure development disturbing soils or changing drainage.

Historic landscapes are another aspect of cultural heritage, including settlements and land boundary patterns and the layers of evidence of past land use both spatially and through time. These are closely linked to a sense of place and the value and knowledge communities have for an area.

Historic England maintain a ‘Heritage at Risk’ register for designated assets such as listed buildings, Conservation Areas, Registered Parks and Gardens or scheduled monuments that are at risk of being lost as a result of neglect, decay or inappropriate development, or are vulnerable to becoming so. The latest Heritage at Risk register for the East of England ¹⁶¹ includes 249 designated heritage assets in the Transport East region, including 162 listed buildings and structures (including places of worship, not including grade II listed buildings), 51 scheduled monuments, 6 registered parks and gardens, and 30 Conservation Areas, that are considered at risk of being lost, and these should therefore be considered.

In addition to designated heritage assets, it should be noted that there are a large number of non-designated heritage assets, including archaeological remains, in the region. These are buildings, monuments, sites or landscapes identified by local authorities as having a degree of heritage significance that merit consideration in planning decisions, but which do not meet the criteria for designated heritage assets. The majority of non-designated assets are recorded on the Historic Environment Records held by County and unitary councils, who are consulted on the scope and results of the ISA.

Key Trends

There is potential for adverse direct effects from development on the setting of designated heritage features from lighting, noise and vibration and visually intrusive activity as well as effects from climate change and air pollution. The adverse effects associated with climate change include an increase in extreme weather, which may deteriorate heritage features, particularly those already in a vulnerable and poor condition or affect soils and drainage with potential effects on both built heritage but also buried archaeological interest. Air pollution can also contribute to the degradation of heritage assets¹⁶².

Issues and Opportunities

The Transport Strategy may negatively affect heritage assets due to loss or damage or setting impacts. By improving connectivity of rural areas, the public may have better access to heritage

assets. The Transport Strategy could bring long term benefits from reducing air pollution. Archaeological and paleo-archaeological interests could however be at risk from infrastructure development. There is an opportunity to consider heritage at risk assets, including their setting. Further potential issues include potential adverse effects on the significance of assets due to loss of or severance of an asset from its setting.

5.14 Soils, Geology and Contaminated Land

The baseline for soils, geology and contaminated land has been derived using the following web sources:

- Landis Soilscales¹⁶³
- BGS Geology of Britain viewer¹⁶⁴
- MagicMap¹⁶⁵
- Natural England¹⁶⁶

The Regions' bedrock comprise three dominant sedimentary rock types - White Chalk; Neogene And Quaternary Rocks (Gravel, Sand, Silt and Clay) and Thames Group (Clay, Silt, Sand and Gravel). There are also smaller outcrops of Mudstone, Sandstone and Limestone. Superficially, the geology primarily includes Till (Diamicton) and Glacial Sand and Gravel¹⁶⁷.

There are 99 SSSIs recognised for their geological significance, nearly half of which are found in Norfolk (40 in Norfolk, 33 in Suffolk, 22 in Essex and 4 in Thurrock). There are also Regionally Important Geological Sites (RIGS) and Local Geological Sites (LoGS).

Throughout the study area, the following soils are prevalent:

- Stagnosols
- Gleysols
- Cambisols
- Luvisols
- Leptosols

Deep peaty soils can be found in the East Anglia Fens, which includes areas within Norfolk and parts of Suffolk. Natural peatland is an important habitat for a number of species and is also identified as a significant carbon sink and considered vital to climate regulation¹⁶⁸. Due to the ongoing national commitments of decarbonisation, this habitat should remain untouched.

The regions agricultural land has been identified using MagicMaps, which shows the regions agricultural land classification (ALC) is predominantly Grade 2 and Grade 3, with some minor Grade 1 and Grade 4. Grade 1 land is excellent quality land with no or minor limitations for cultivation, Grade 2 is very good quality land and Grade 3 refers to land which is 'good to moderate' quality, meaning there are minor limitations to the choice of crop and Grade 4 is 'poor quality'. Grade 3 can be subdivided as 3a and 3b although this subdivision is not available for the regional mapping. A large proportion of the region is considered 'best and most versatile land' (Grade 1, 2 or 3a) (see Figure 5.10).

Key Trends

The main area for change is the potential pressure for development may cause an increase in pressure for land and result in the loss of valuable soils. Changes to agricultural practices can also influence erosion rate and loss of soil nutrients and climate change will also affect soils and drainage and their vulnerability to erosion. Climate change and more frequent extreme weather may result in peat drying out, which will release stored carbon¹⁶⁹. Increased areas required for waste disposal may cause land contamination.

Issues and Opportunities

The 99 SSSIs designated for their geological significance, local geological sites and areas of natural peatland should be avoided to ensure there is no detriment. There may be opportunities to link decarbonisation aims to initiatives to improve soil carbon storage and peatland restoration.

5.15 Material Assets and Resources

The baseline for material assets and resources has been derived using the following sources:

- Regional Evidence Based (Transport East)¹⁷⁰
- CORINE Land Cover¹⁷¹

Material assets and resources are broad terms, taken in this context to mean physical materials that are valued and/or used by people. This can include buildings and infrastructure, including urban areas, transport routes, minerals and land. Assets and resources relating to cultural heritage, the natural environment / biodiversity and water resources are examined under other headings in this report.

The material assets and resources that could be considered in the Transport East region¹⁷² include:

Population and housing:

- Approximately 3.5 million people live in the region, 33% in rural locations (a highly rural area, as compared to the 19% average for England), in around 1.54 million homes. The number of dwellings in the region has increased by 5% between 2009 and 2017 with an average increase of 8,784 homes a year.
- The region has two cities (Norwich and Chelmsford) and these and the largest towns (Southend-on-Sea, Ipswich, Colchester, Grays, Harlow and Thurrock) are the main population and economic centres, supported by a large number of smaller towns including King's Lynn, Great Yarmouth, Bury St Edmunds, Lowestoft, Basildon, Braintree, Clacton-on-Sea, Epping, Brentwood, Canvey Island and Harwich.

Transport infrastructure:

- There are 15 strategic road and rail corridors in the region, which has approximately 82 km of motorways (the M11 and M25 in Essex and Thurrock) and 589 km of dual carriageway A roads. The major road network provides important north-south connectivity within Norfolk and Suffolk (A140, A12, A146, A131, A134, A1307) and east-west connectivity in Essex, Southend-on-Sea and Thurrock (A127, A13, A130, A133 and A1159).
- Three main radial railway routes (Great Eastern Main Line, West Anglia Main Line and Essex Thameside) connect the main urban settlements with London and limited east-west connections (Felixstowe to Ipswich, Ipswich to Cambridge, Norwich to Cambridge and Norwich to Peterborough via Ely), with branch lines connecting smaller settlements (See Figure 5.10).
- Walking and cycling is supported by the region's National Trails (including the Peddar's Way and Norfolk Coast Path), public rights of ways and National Cycle Network routes.
- There are 13 ports, including the UK's busiest container port at Felixstowe, Harwich Port, Port of Tilbury and DP World London Gateway, and three international airports (London Stansted Airport, London Southend Airport and Norwich Airport). Heavy goods vehicle traffic in the region is dominated by routes accessing the main ports (Figure 5.10). There are also operational military airfields within the region, at RAF Marham in Norfolk, and RAF Lakenheath and RAF Mildenhall in Suffolk (both hosting US Air Force and other US Visiting Forces units).

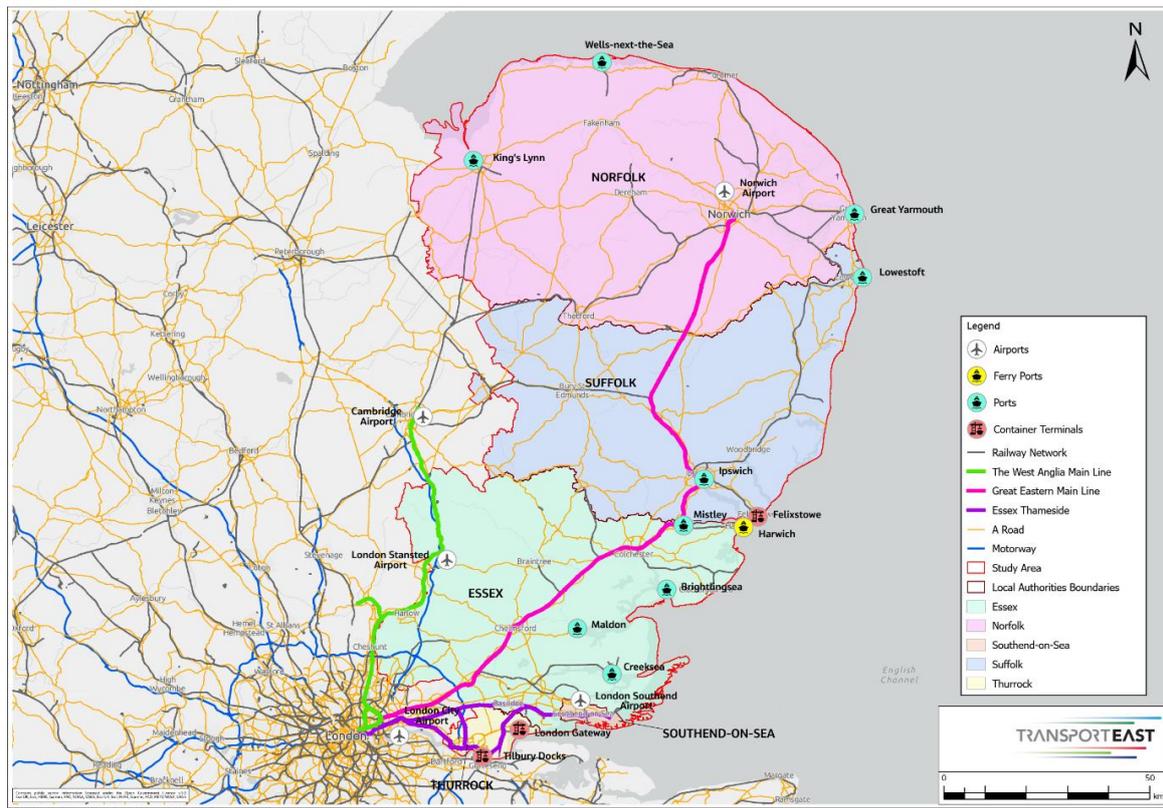


Figure 5.10: Transport Infrastructure in the Transport East region

Economic:

- The Transport East Region has a diverse economy, the main sectors being distribution, public administration, real estate and manufacturing, and there are also key strengths in ICT, agri-tech, biosciences, green energy production, financial industries and the visitor economy.
- Construction, transport and logistics have particular importance, with the UK's busiest container port at Felixstowe and the international shipping ports of DP World London Gateway and Tilbury, which require good rail and road links.

Energy:

- The Region's coastline hosts the nuclear power (Bradwell and Sizewell) industry and the offshore renewables industry with major offshore windfarms including Scroby Sands, Sheringham Shoal, Greater Gabbard, London Array, Gunfleet Sands and Galloper.

Agriculture:

- Around three quarters of the Region's land is used as productive farmland, half being arable. Farms are on average (118 hectares) larger than England as a whole (86 hectares; data from 2018) and are major producers of wheat, barley and oil seed rape, sugar beet, potatoes, pigs, chickens and eggs.
- Half of the farmland in Essex, and large parts of Norfolk and Suffolk, are classed as 'best and most versatile land', of Grade 1, 2 or 3a under the Agricultural Land Classification. (Figure 5.11)

Minerals:

- The Region has working and allocated sites for sand and extraction, and a smaller number of sites that make an important contribution to the national production of silica sand. Minerals are transported long distances by both road and rail, including through strategic rail depots and marine wharves.

- The Norfolk Minerals and Waste Local Plan Review 2019¹⁷³ proposes to plan for the extraction of 10.5 million tonnes of silica sand in West Norfolk, 340,000 tonnes of carstone and 20.3 million tonnes of sand and gravel during the Plan period to 2036.
- The Suffolk Minerals and Waste Local Plan 2020¹⁷⁴ allocated nine sites for the extraction of sand and gravel sufficient to supply 9.3 million tonnes over the Plan period to the end of 2036.
- Essex Minerals Local Plan 2014¹⁷⁵ sets out additional provision for 40.67 million tonnes of sand and gravel and 0.39 million tonnes for silica sand within the Plan period to 2029.

Forestry:

- The CORINE inventory¹⁷⁶ estimates that 5% of the region has woodland cover. The largest forested areas are Thetford Forest in Norfolk/Suffolk (the largest lowland pine forest, and largest man-made lowland forest in the UK), and Epping Forest in Essex/ London.

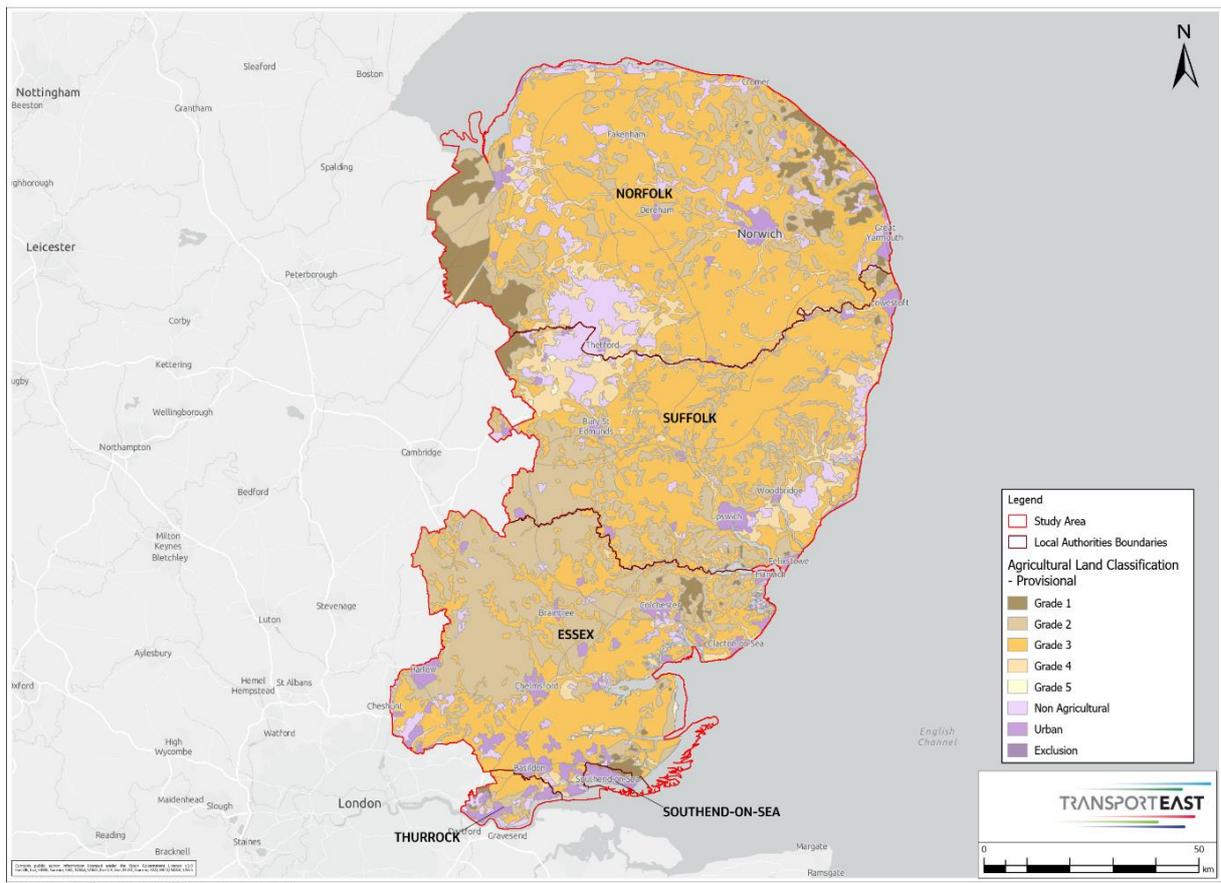


Figure 5.11: ALC for Transport East region

Key Trends

Land use changes including development and planning pressures for the expansion of housing and urban land uses, transport investment decisions including a range of existing planned road and rail schemes, demand for minerals, and agricultural change.

Issues and Opportunities

Potential issues include loss of sterilisation of material assets from infrastructure development or conflict with other land uses. There are opportunities to improve access along congested or poorly connected routes

5.16 Natural Capital and Ecosystem Services

Natural capital can be defined as: *‘the sum of our ecosystems, species, freshwater, land, soils, minerals, our air and our seas. These are all elements of nature that either directly or indirectly bring value to people and the country at large. They do this in many ways but chiefly by providing us with food, clean air and water, wildlife, energy, wood, recreation and protection from hazards’*¹⁷⁷. The direct and indirect benefits provided by natural capital assets are known as **ecosystem services**.

To develop a natural capital baseline, a proportionate two-staged approach has been taken including spatial analysis and review of strategic documents.

Spatial Analysis

Several approaches to developing natural capital approaches are available, as detailed in resources such as Defra’s Enabling a Natural Capital Approach¹⁷⁸ and Natural England’s Natural Capital Indicator work¹⁷⁹. For the purposes of this Scoping Report, it has been considered important to:

- Identify a method to indicate the coverage of natural capital assets, allowing for interpretation as to potential ecosystem services; and
- Identify high-value habitats and opportunities for future enhancement.

The following datasets have been utilised for the purposes of developing a natural capital baseline:

- CORINE Land Cover 2018 – Provides a continuous coverage of land cover across the study area, allowing the quantity and spatial coverage of natural capital assets to be identified. Subsequently, assumptions can be made in regards ecosystem service provision.
- Natural England’s Habitat Networks (Combined Habitats) (England)¹⁸⁰ – Provides the geographic extent and location of 18 priority habitats nationally which may support biodiversity net gain and potential environmental net gains.

In addition, the following have been reviewed:

- Natural Capital Compendium for Norfolk and Suffolk¹⁸¹ - Presents information on natural assets across Norfolk and Suffolk and considers potential risks to these assets.
- Essex Green Infrastructure Strategy¹⁸² (includes Thurrock and Southend-on-Sea) – Describes the need for green infrastructure in Greater Essex and sets out a vision and objectives for its delivery.
- OpenNESS case study: Mapping Cultural Ecosystem Services in Essex¹⁸³ - Investigates how cultural ecosystem services can be used in decision-making in Essex.
- Whilst it is acknowledged that a ‘Natural Capital Check’ has been produced for Essex, this document is not publicly available and therefore has not been incorporated into the natural capital baseline for the purposes of the Transport East Transport Strategy – Integrated Sustainability Assessment.

The CORINE inventory consists of 44 classes of land cover using a different classification system to the UK Broad Habitat Types identified in the UK National Ecosystem Assessment (NEA)¹⁸⁴ typically used for natural capital assessments. Nonetheless, a translation of CORINE 2018 Land Cover data classifications to UK Broad Habitat Types has been completed as presented below in Table 5.21 and Figure 5.12.

Table 5.21: UK Broad Habitat Type area and percentage cover across the study area

Broad Habitat Type	Area (ha)	Percentage (%)
Coastal margins	52,814	4%
Enclosed farmland	906,882	68%
Freshwater	13,832	1%
Marine	1,554	0.1%

Broad Habitat Type	Area (ha)	Percentage (%)
Mountain, moor, and heathland	5,060	0.4%
Semi-natural grassland	162,931	12%
Urban	122,919	9%
Woodland	64,608	5%

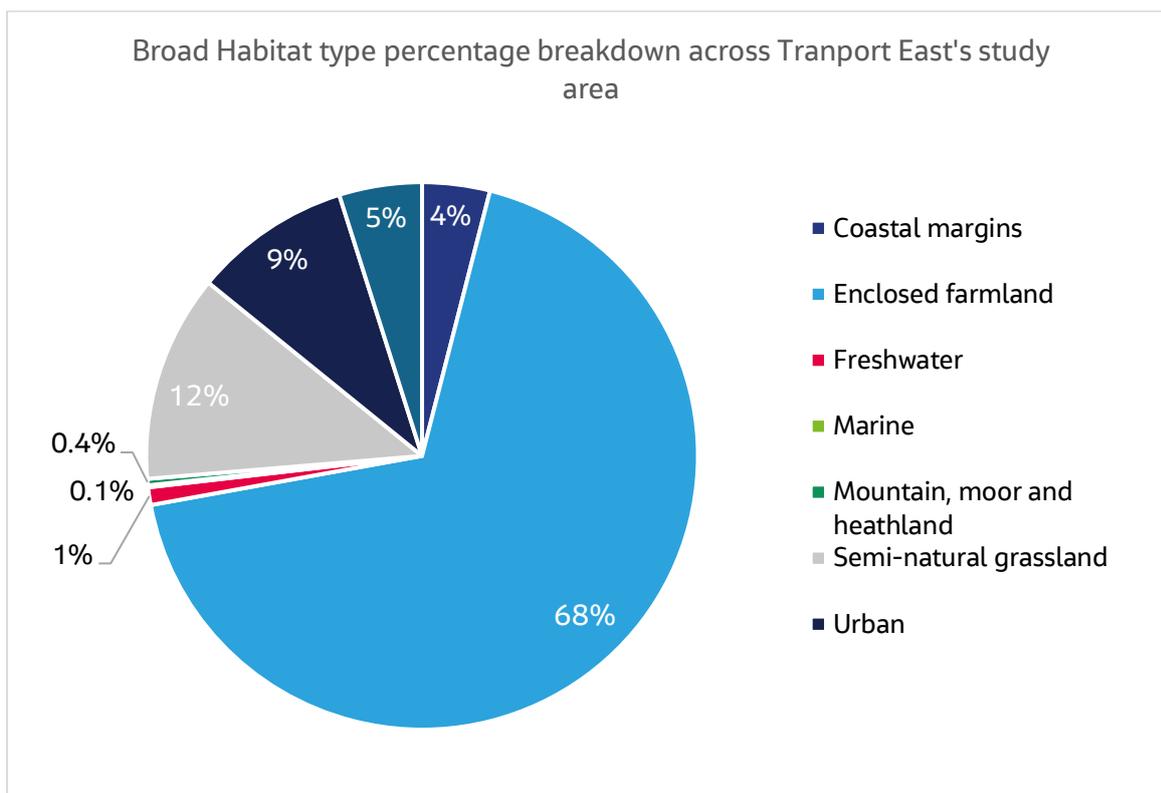


Figure 5.12: Broad Habitat Type percentage across study area

Each of the UK Broad Habitat types present can provide a variety of ecosystem services as listed in Appendix D.

When assessing the benefits and values associated with natural capital and ecosystem services, a logic chain approach (as developed by Natural England¹⁸⁵) can be used, as presented below in Figure 5.13. This looks at data on natural capital asset quantity, quality and location, the ecosystem services likely to be provided, the benefits and the value and benefits to society. For this baseline, an assessment of ecosystem asset **quantity** has been provided.



Figure 5.13: Natural England logic chain for assessing natural capital assets

Habitat Networks

Priority habitats, those that are most threatened and in need of conservation, across the Region (see Figure 6 – Appendix 6) comprise offering opportunities for biodiversity net gain:

- Ancient woodland
- Coastal
- Lowland dry acid grassland
- Lakes
- Lowland calcareous grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Purple moorgrass and rush pasture
- Reedbeds
- Rivers
- Traditional orchards
- Wood-pasture and parkland

Natural England's Habitat Networks (Individual Habitats) (England) data also presents information on habitat restoration and creation opportunities with Table 5.22 providing an overview of the restoration and creation opportunities, which include:

- **Restorable habitats:** Sites where data suggests small fragments of the primary habitat or degraded habitat exists and where restoration may be possible.
- **Network Enhancement Zone 1:** Land within close proximity to the existing habitat components that are more likely to be suitable for habitat re-creation for the particular habitat.
- **Network Enhancement Zone 2:** Land within close proximity to the existing habitat components that are unlikely to be suitable for habitat re-creation but where other types of habitat may be created, or land management may be enhanced including delivery of suitable Green Infrastructure.
- **Fragmentation Action Zone:** Land immediately adjoining existing habitat patches that are small or have excessive edge to area ratio where habitat creation is likely to help reduce the effects of habitat fragmentation.
- **Network Expansion Zone:** Land within relatively close proximity to the Network Enhancement Zones 1 & 2 that are more likely to be suitable for habitat creation for the particular habitat and identifying possible locations for connecting and linking up networks across a landscape and identifying possible locations for connecting and linking up networks across a landscape

Table 5.22: Restoration and creation opportunity area by habitat type within the Transport East study area

Habitat	Restorable Habitat (ha)	Network Enhancement Zone 1 (ha)	Network Enhancement Zone 2 (ha)	Fragmentation Action Zone (ha)	Network Expansion Zone (ha)	Total
Ancient Woodland	2,148	-	50,932	527	-	53,607
Coastal	27,403	16,662	20,573	3,210	12,940	80,788
Lowland dry acid grassland	935	9,587	5,819	2,304	34,494	53,139
Lakes	2,370	-	43,868	80	-	46,318
Lowland calcareous grassland	345	6,545	5,227	498	28,431	41,046

Habitat	Restorable Habitat (ha)	Network Enhancement Zone 1 (ha)	Network Enhancement Zone 2 (ha)	Fragmentation Action Zone (ha)	Network Expansion Zone (ha)	Total
Lowland fens	15,564	21,271	36,133	5,271	50,994	129,233
Lowland heathland	600	12,793	7,272	3,799	44,699	69,163
Lowland meadows	7,601	22,540	6,616	1,274	77,276	115,307
Purple moorgrass and rush pasture	35	5,752	3,635	1,083	31,225	41,730
Reedbeds	17,144	32,173	5,190	3,771	40,650	98,928
Rivers	1,517	-	14,205	5	-	15,727
Traditional orchards	1,150	39,576	2,255	-	-	42,981
Wood-pasture & parkland	4,011	8,217	745	160	25,505	38,638
Total	78,675	175,116	151,538	21,455	346,214	-

Table 5.22 displays that the largest opportunities for creation and restoration include lowland meadow and lowland fens. For network expansion, d ancient woodland and lakes, where habitat re-creation is unlikely but where other types of habitat may be created, or land management may be enhanced.

Enhancing priority habitats can also provide carbon sequestration opportunities.

Key trends

Key trends are presented in Table 5.23 below.

Table 5.23: Natural assets, features, key trends, and risks across the Transport East study area

Asset	Feature	Key trends	Risks
Land	Food producing land	More of the best food-producing land grades than English average in Norfolk and Suffolk (25.5% Grades 1&2 and 53.8% Grade 3). 61% of Essex graded agricultural land.	Growing risk: Reducing water availability impacting food production. Risk to productivity from climate change, poor management and pollution.
	Productive woodland	The Brecks has 27.6% forest cover. Provides recreation, as well as timber and energy from waste wood. Woodland cover of Greater Essex is 5.3% of total land area, of which 3.5% is defined as ancient woodland	Growing risk: Risk from pests, pathogens, invasive species, and climate change induced extreme weather events.

Asset	Feature	Key trends	Risks
	Land under conservation management	<p>Sites designated for nature conservation cover 10% of Norfolk and Suffolk's land.</p> <p>Multiple designations across the counties.</p> <p>Broad scatter of smaller sites that form island sanctuaries in agricultural landscapes also important to enable species to migrate across the landscape.</p>	Growing risk: Risk to species and habitats from climate change, urbanisation and salinisation.
	Carbon density in vegetation	<p>Woodland, heaths, and freshwater margins have the highest rates of carbon storage in the counties.</p> <p>Due to the land area under agriculture, the total amount of carbon stored by farmland is greater than all other land uses combined in Norfolk and Suffolk.</p>	Growing risk: Fire risk and drought impact on carbon stored.
Soil and Sub-Surface	Soil physical properties	High soil loss by water erosion (16t/ha/yr) in North Norfolk and other smaller areas across the counties.	Growing risk: Climate Change with drier summers increasing wind erosion, soil shrinkage etc.
	Soil biological health	Soil invertebrate abundance is highest in freshwater margins and less disturbed habitats ¹	Growing risk: Intensive agriculture caused arable soils to lose organic carbon, climate change could exacerbate organic matter decomposition.
	Aquifers	<p>Around 90% of Norfolk and Suffolk is underlain by aquifers of high/medium productivity.</p> <p>More prevalent areas are The Brecks, and Suffolk Coast & Heaths AONB.</p>	High risk: Increasing demand and over abstraction, increasing saline intrusion.
	Fenland/wetland soils	Drainage for agricultural production has led to considerable shrinkage and loss.	High risk: Climate change causing drying out of peatlands, reducing habitat extent and quality, risking natural carbon stores and increased emissions.
Habitats and Species	Priority habitats	Coastal saltmarsh, peatlands, and heathland habitats are regionally important.	High risk: Climate change, loss of habitat to sea level rise, coastal erosion, flooding, increased incidence of pests and diseases, invasive species, urbanisation.
	Extent and condition of SSSIs	<p>Norfolk has 8.2% of land within a SSSI and Suffolk has 7.5%.</p> <p>Essex has 86 sites designated as SSSI.</p>	Medium risk: Degradation through lack/reduced frequency of monitoring and appropriate management.

¹ The Norfolk and Suffolk Natural Capital Compendium (<https://norfolkbiodiversity.org/assets/Uploads/NCC-SCC-Natural-Capital-Assets-Evidence-Compendium-30oct20.pdf>) identifies that soil bacteria diversity is relatively uniform across natural habitats and cultivated land. This information originates from the mean estimates of bacterial diversity in topsoil per 1km² which have been extrapolated from sets of sample locations by CEH. It is acknowledged that agricultural activity can alter soil bacteria diversity and local assessments may show varying results.

Asset	Feature	Key trends	Risks
	Habitat connectivity	More than 75% of priority habitats are in patches under 10ha in size and connectivity needs to be improved.	Growing risk: Due to increasing development and urbanisation
	Natural woodlands	Very little ancient woodland (0.8%) in Norfolk and Suffolk. 5.1% is broadleaf and mixed woodland. Woodland cover of Greater Essex is 5.3% (195km ²) of total land area, of which 3.5 % (128km ²) is defined as ancient woodlands over 2 hectares in size, of which 73km ² is Ancient Semi Natural Woodlands (ASNW).	Growing risk: Impacts of climate change, frequency of droughts and storms events, pressures from pest and pathogens.
	Lowland heath and dry acid grasslands	4,711ha of lowland heath, 8.4% of England's total holding of this habitat in Norfolk and Suffolk. 4,203ha of dry acid grasslands, 27.7% of England's total holding of this habitat in Norfolk and Suffolk.	Growing risk: Pollution, climate change, seasonal fires and change in precipitation levels.
	Saltmarsh and coastal habitats	Norfolk and Suffolk's coasts hold over 12% of England's total Saltmarshes and over 17% of vegetated shingle habitat.	High risk: Coastal erosion, sea level rise, invasive species, and nutrient enrichment.
	Wetlands and grazing marsh	Lowland fen within Norfolk and Suffolk, accounts for 19.4% of England's total holding and reedbeds account for 45.8%.	High risk: Wetland drying out, eutrophication, oxidation of peat, reducing habitat extent and quality.
Freshwater	Surface water quality	Very few water bodies meet 'good' status, largely due to ecological shortcomings in Norfolk and Suffolk.	High risk: Risk to clean water provision due to increasing demand and pollution from agriculture and urban areas.
	Ground water quality	Overall 'poor' ground water status of virtually the whole of Norfolk and Suffolk.	Growing risk: Reduction in groundwater quality due to over abstraction, pollution and saline intrusion due to sea level rise.
	Water availability	Driest region in the UK, with projections indicating a regional net deficit of around 200Ml/d by 2050.	High risk: Projected deficit in future supply over demand, climate change may further impact.
	Flood risk	Over 11% of Norfolk and Suffolk is rated by the Environment Agency as having at least a 1 in 100 flooding risk in any given year. Approximately 50,000 houses in Essex are at risk of coastal flooding and 36,000 are at risk from surface water flooding.	Medium risk: Due to urban expansion and surface water flooding from impermeable surfaces. More intense rainfall due to climate change.
	Chalk rivers	Norfolk and Suffolk have 565km of chalk river, nearly 17% of England's total and hosts many distinctive species. Threats to these rivers include pollution, abstraction, sedimentation, and invasive species	Growing risk: Biodiversity loss due to pollution and invasive species.
	Recreational use of waterways	Recreation within the Broads generated over £600 million in 2017.	Medium risk: Deterioration of water quality could have

Asset	Feature	Key trends	Risks
		Managing visitor and wildlife needs is an ongoing challenge.	implications for recreational opportunities.
Coast and Marine	Marine habitats and protected areas	Over 90% of inshore/coastal marine habitats in Norfolk and Suffolk falls within Marine Protected Areas.	Growing risk: Invasive species, marine litter, underwater noise, and water quality.
	Fish stocks	Economic uncertainty regarding future of commercial fishing in the region due to regulation and sustainability of fish stocks from environmental pressures.	Medium risk: Increase in ocean temperature due to global warming.
	Seabird and migratory birds	North Norfolk particularly important for migration and provides winter refuge for large flocks of waders/wildfowl. Summer breeding of terns and other seabirds, wildfowl and waders along the coast. Good Ecological Status (GES) is not being achieved for most birds.	Medium risk: Reasons for not achieving GES need to be investigated. Wind turbine collisions.
	Recreation	Coast attracts nearly 12 million day visits and total visitor spend of around £330m in Norfolk and Suffolk.	Medium risk: Sea level rise and loss of natural assets.
Atmosphere	Air quality - particles	PM2.5 levels in much of Norfolk and Suffolk, above the average for England. The annual concentration of human made fine particulate Matter in Essex in 2016 was 9.6µg/M3 (adjusted to account for population exposure) compared to England's average of 9.3 µg/M3.	Medium risk: Health and environment impacts from particles with increasing urbanisation. Transition to electric vehicles should help to mitigate this.
	Greenhouse gas emissions	Norfolk and Suffolk have higher per capita emissions (5.6 t/pp/yr) than the average for England (5.0t/pp/yr). Point-source emitters produce approximately one quarter of CO ₂ emission in the two counties (2,088,303 tCO ₂ e).	High risk: Greenhouse gases have induced global warming.

In addition to the specific risks to natural assets highlighted in Table 5.23, the document review identified drivers and pressures affecting the ability of natural capital assets to deliver ecosystem services:

- Changing climate: Mean summer and winter temperatures increasing, with projections for a further increase in summer temperatures of 1.2-1.6°C by the 2040s.
- Environmental change – precipitation: Future projections suggest a decrease in mean summer precipitation and an increase in mean winter precipitation in the Region. Rainfall intensity is expected to increase, with implications for runoff, flooding and loss of soils.
- Environmental change – sea level rise: Local sea level rise projections show an increase in sea level between 2007 and 2100 e.g. projections for Great Yarmouth indicate a 0.2-0.4m rise by mid-century and potentially 0.6-1m+ by 2100.
- Social change: Population expected to increase with an increased proportion of elderly and further urbanisation.
- Economic setting: funding and resourcing are needed to deliver new or manage and maintain existing green infrastructure.

Issues and opportunities

There are potential impacts on natural capital and ecosystem services from direct land take or land use change or impacts on condition from transport related infrastructure development. Opportunities include contributing to biodiversity net gain and environmental net gain through enhancement of habitats and connectivity, and linked opportunities for carbon sequestration and water regulation and provision of recreational benefits. Opportunities and issues are detailed further in for each of the ecosystem services identified in Appendix D and incorporated with the related topics and ISA objectives.

6 Assessment Methodology

6.1 Scope of the assessment

The ISA is a high level and objective based assessment. The ISA objectives were developed to cover the ISA topics (as set out in Table 6.1) following a review of relevant Plans, Policies and Strategies, an appreciation of the baseline context and feedback from consultations at the Scoping Stage. These reviews are also reflected in the criteria to be used as the framework for the development and assessment of the draft Transport Strategy and IDP.

Table 6.1: ISA objectives

ISA Topic	ISA Objectives	Question to consider in assessing performance against the ISA objectives
Population and Socioeconomics	Support local economic development and accessibility to economic opportunities, employment and community facilities	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ Affect quality of life in terms of improved access to transport to jobs, schools, shops and other community facilities including for those without access to a car? ▪ Reduce and avoid creation of real or perceived severance from linear infrastructure? ▪ Reduce journey times for commuting? ▪ Improve reliability of journey times? ▪ Improve quality of travel and access to information? ▪ Support local economic development for employment and community facilities? ▪ Support employment and training opportunities? ▪ Support access for tourism and recreation ▪ Support changes resulting from effects of COVID/Brexit on the economy and transport
Equality and Diversity	Support and promote improved access for all	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ Improve access for rural populations and towns outside main growth areas dependent on public transport? ▪ Support improved services for transport deserts? ▪ Improve physical access for all groups with protected characteristics, including for example, the elderly and young, women, physically and cognitively disabled and mobility impaired people? ▪ Improve accessibility to services, facilities and amenities for all? ▪ Improved affordability of transport and access to electric vehicle transport (including e-bikes for example)?
Health	Protect and enhance health and well being	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ Improve opportunities and access for active travel and raise public awareness of active travel? ▪ Reduce congestion, noise and air quality impacts from transport? ▪ Improve access to greenspace (such as parks and countryside) blue space (water related amenity areas) rivers, wetlands, lakes, and coast) and opportunities for physical activity?
Community Safety	Support and promote community safety	<ul style="list-style-type: none"> ▪ Improve road user safety and reduce risk of collisions and road danger including for active travel? ▪ Improve actual and perceived safety and security for users of public transport for all groups?
Biodiversity	Protect and enhance biodiversity	Are there potential adverse effects on or improvements to:

ISA Topic	ISA Objectives	Question to consider in assessing performance against the ISA objectives
	Protect and enhance International and European sites	<ul style="list-style-type: none"> ▪ European; (Natura 2000) or species protected in Annex II and IV of Habitats Directive and Annex I of Birds Directive? ▪ Nationally designated sites NNR/SSSI or protected species? ▪ Local, county biodiversity including Biodiversity Strategy objectives? ▪ Wildlife corridors or connectivity?
Water Environment	Protect and enhance water resources and water quality and contribute to reduction in flood risk and disruption from flood events	<p>Is there potential for:</p> <ul style="list-style-type: none"> ▪ Conflict with River Basin Management Plan proposed measures /or Water Framework Directive objectives? ▪ Is there potential to affect water quality through pollution ▪ Are there opportunities to contribute to improvements (such as removal of barriers as part of schemes)? <p>Is there a potential to increase flood risk?</p> <ul style="list-style-type: none"> ▪ Is there potential to increase surface water run off or ground water flood risk ? ▪ Is there potential to reduce existing flood risk vulnerability?
Air Quality	Contribute to the mitigation of air pollution issues from transport and optimize potential for reduction in air pollution	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ contribute to improvements to air quality or to increase air pollution? ▪ Is there potential to contribute to air pollution reduction affecting sensitive habitats
Noise and Vibration	Contribute to mitigation of noise pollution as a result of transport and optimize potential for reducing noise/vibration	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ reduce or increase the number of people exposed to high levels of transport related noise? ▪ Will areas of high tranquility be affected by increased disturbance or is there potential to increase tranquil areas?
Climatic Factors	<p>Climate change mitigation: Contribute to achieving net zero carbon targets by reducing greenhouse gas emissions from construction of new/upgraded transport infrastructure or operation of existing and new transport networks, modal shift changes or new technologies.</p> <p>Climate change adaptation: improve resilience to climate change for the transport network and promote improved environmental resilience to climate change.</p>	<p>Is there potential for:</p> <ul style="list-style-type: none"> ▪ Proposals to support modal shift, active travel, reduce traffic and contribute to reducing carbon emissions? ▪ Increase vulnerability or improve resilience of the environment and transport network and other strategic infrastructure to climate change? (Note flood risk increase addressed under water environment topic)
Landscape/ Townscape and Visual	Protect and enhance the character and diversity of the landscape/ townscape and avoid or minimise adverse visual effects on sensitive,	<p>Is there potential to</p> <ul style="list-style-type: none"> ▪ Impact or contribute to improvement to designated or sensitive and valued landscapes including the Broads,

ISA Topic	ISA Objectives	Question to consider in assessing performance against the ISA objectives
	valued and designated landscapes and public views	<p>Areas of Outstanding Natural Beauty, rural landscapes, townscapes and coastal views or affect visual amenity</p> <ul style="list-style-type: none"> ▪ Potential to cause light pollution in dark skies (as defined in the CPRE's interactive map England's Light Pollution and Dark Skies) ? ▪ Impact protected landscapes and their settings?
Cultural Heritage and Archaeology	Protect cultural heritage and archaeological assets and contribute to improved access to cultural heritage sites	<p>Is there potential to:</p> <ul style="list-style-type: none"> ▪ Impact on, or to conserve and enhance, the significance of designated and non-designated heritage assets, including any contribution made to that significance by setting, and any Heritage at Risk historic landscapes or to archaeological interest (including coastal / marine based archaeology, old bridges and railway corridors and undiscovered archaeology)? ▪ Potential to improve access to cultural heritage sites?
Soils, Geology and Contaminated Land	Avoid conflicts with geological sites of value. Minimise loss of soil resources and contribute towards the appropriate management of soil resources and quality.	<p>Would there be any effects on:</p> <ul style="list-style-type: none"> ▪ Designated geological sites, valuable soils or potential for pollution from contaminated land sites? ▪ Would peat and wetland soils be at risk?
Material Assets and Resources	Promote the sustainable use of natural resources including land and mineral bearing land, encourage reuse, recycling and waste minimization and effective use of existing infrastructure.	<p>Is there potential for:</p> <ul style="list-style-type: none"> ▪ Conflicts with critical infrastructure or with existing and planned land use or valuable agricultural land? <p>Does the strategy encourage:</p> <ul style="list-style-type: none"> ▪ Reuse of existing transport infrastructure and/or brownfield sites? ▪ Change to renewable energy for transport
Natural Capital and Ecosystems Services	Protect natural capital and associated ecosystem services, whilst seeking to provide opportunities for enhancement	<ul style="list-style-type: none"> ▪ Is the strategy likely to result in change to natural capital and associated ecosystem services and is there scope for contributing to future requirements for biodiversity and environmental net gain to be accommodated within strategy implementation? ▪ Will there be severance or loss of connectivity or opportunity to improve connectivity?

Interaction between topics

The potential interaction, in particular to consider potential cumulative and in combination effects, across ISA topics is recognised and summarised in Table 6.2.

Table 6.2: Interactions between topics

	Population and Socioeconomics	Equality and Diversity	Health	Community Safety	Biodiversity	Water Environment	Air Quality	Noise and Vibration	Climatic Factors	Landscape/ Townscape and Visual	Cultural Heritage and Archaeology	Soils, Geology and Contaminated Land	Material Assets and Resources	Natural Capital and Ecosystem Services
Population and Socioeconomics														
Equality and Diversity	■													
Health	■	■												
Community Safety	■	■	■											
Biodiversity	■		■											
Water Environment	■		■		■									
Air Quality	■	■	■		■									
Noise and Vibration	■	■	■		■									
Climatic Factors	■	■	■		■	■	■							
Landscape/Townscape and Visual	■	■	■	■	■	■			■					
Cultural Heritage and Archaeology	■		■		■	■	■	■	■	■				
Soils, Geology and Contaminated Land			■		■	■			■	■	■			
Material Assets and Resources	■	■	■	■		■	■	■	■	■	■	■		
Natural Capital and Ecosystem Services	■	■	■		■	■	■	■	■	■	■	■	■	

6.2 Influencing the Transport Strategy and IDP through the ISA

Development of the draft Transport Strategy and draft IDP and completion of the ISA has been an integrated and iterative process, with ISA mitigation recommendations contributing to the evolution of the Transport Strategy.

A Sustainability Action Plan and ISA Monitoring Plan have been developed as draft for consultation based on the ISA assessment of the draft Transport Strategy and IDP. Both Plans provide a framework and mechanism for monitoring the beneficial and adverse effects (including cumulative effects) of the Transport Strategy and IDP. The results of monitoring then provide an evidence base to inform future revisions of the Transport Strategy and IDP.

6.3 Assessment approach

The assessment provided within this ISA Report considers both the draft Transport Strategy itself and interventions included within the accompanying draft Investment Delivery Programme (IDP)

The assessment regulations require consideration of alternative approaches or options; a description of how a proposed approach was selected; as well as assessment of potential significant adverse effects. These are described for the Transport Strategy and IDP separately below.

Assessment of the Draft Transport Strategy

The draft Transport Strategy has been developed with consideration of a range of economic and population growth and post Covid return to workplace scenarios. These represented a range of future conditions that the Transport Strategy would need to respond to and be delivered within. The assessment considers the viable alternative approaches that the Transport Strategy could adopt before detailing the proposed approach and how this is proposed to be taken forward as described in the draft Transport Strategy.

Alternatives

Three potential transport approaches have been considered during development of goals included under the Transport Strategy strategic pathways. These are:

- Focus primarily on promotion and facilitation of the use of alternative fuels.
- Focus primarily on promotion and facilitation of modal shift towards passenger transport and active travel modes.
- Combined approach to delivery including both promotion and facilitation of the use of alternative fuels and also modal shift towards passenger transport and active travel modes.

A high-level assessment of these approaches has been undertaken using the criteria set out in Table 6.3 to identify which would be the most supportive for the ISA objectives and help facilitate identification of goals under the strategic priorities and associated pathways. The assessment is also informed by baseline analysis and key trends set out in section 5.

Table 6.3: Significance criteria for assessment of the Transport Strategy and compatibility with ISA objectives

Description of Effect/Risk	Assessment against objectives
The transport strategy objective or goal has potential for contribute significant positive effect on the ISA receptors associated with this or contribute to achieving the objective.	+
The transport strategy objective or goal has potential for neutral or significant positive effects on the environmental receptors associated with this objective depending on how the policy or objective is delivered.	0/+
The transport strategy objective or goal has potential for mixed significant positive & negative effects on the environmental receptors associated with this objective.	+/-
The transport strategy objective or goal has potential for neutral effect on the environmental receptors associated with this objective.	0

Description of Effect/Risk	Assessment against objectives
The transport strategy objective or goal has potential for neutral or significant negative effects on the environmental receptors or conflicts with the ISA objective depending on how the policy or objective is delivered.	0/-
The transport strategy objective or goal has potential for significant negative effect on the environmental receptors or conflicts with the ISA objective.	-
The transport strategy objective or goal effects are uncertain/there is insufficient information on which to determine effect on potential environmental receptors associated with this objective at this stage.	?

Proposed Draft Transport Strategy

The assessment of the Draft Transport Strategy has been undertaken in two stages as set out below. At each stage, the assessment criteria established in Table 6.4 have been used to identify where objectives or goals are supportive of the ISA objectives or where there is potential for conflict.

- Assessment of the transport strategy against the ISA objectives, including recommendations regarding the nature of the objectives have been made where opportunities to improve alignment with the ISA objectives have been identified.
- Assessment of goals and measures included under each of the four strategic priority pathways for the Transport Strategy against the ISA objectives, including recommendations regarding the content and delivery of goals and measures in order to better align with the ISA objectives and guide the identification of interventions to be included in the IDP.

Cumulative effects

The assessment of cumulative effects for the Transport Strategy considers where positive or negative impacts on the ISA objectives would occur either as a result of:

- Additive or synergistic effects between goals and measures included under each of the four strategic priority pathways (i.e intra-plan cumulative effects).
- Additive or synergistic effects between the Transport Strategy and other national or regional level plans or policies (i.e. inter-plan cumulative effects).

Assessment of the Draft IDP

Interventions included within the 'Approach to the IDP' and identified for delivery within a 0-5 year timescale, termed priority interventions, have been assessed in accordance with the process described below under 'Assessment of the IDP'.

Interventions planned for delivery within a 5-10 year timescale have not been assessed further at this stage as the Transport Strategy and IDP will be regularly updated to ensure that they remain relevant to the evolving transport challenges that the region faces and continue to support the Government in achieving national aspirations for new homes and jobs, levelling up, boosting international trade, and achieving net zero as we recover from the COVID-19 pandemic. As such, there is some uncertainty regarding the nature and delivery of schemes currently included in the IDP for the 5-10 year timescale.

Alternatives

All potential interventions included within the draft IDP have been subject to a high-level risk-based assessment for compatibility with the ISA objectives in accordance with the criteria set out in Table 6.4. This was undertaken to identify options considered at higher risk of conflict with the ISA objectives and contribute towards the planned delivery timescales for interventions. The higher risk options are where possible scheduled towards the end of the delivery period to allow time for re-evaluation of need/alternatives and further study to inform mitigation recommendations.

Proposed Draft IDP Approach

Each intervention included within the draft IDP with a delivery timescale of 0-5 years has been assessed against the ISA objectives in accordance with the nine-point significance set out in Table 6.4. ISA mitigation is identified and recorded against each option and ISA objective combination (where required).

Table 6.4: Significance criteria for assessment of IDP interventions against ISA objectives

Description of Effects/Risks	Scale of Effect
Major benefits / contribution to meeting ISA objectives (widespread/large scale)	+++
Moderate benefits /contribution to meeting ISA objectives	++
Minor benefits /contribution to meeting ISA objectives (local and small scale)	0/+
Neutral or not applicable	0
Minor adverse effects or potential conflicts with ISA objectives (local and small scale)	0/-
Moderate adverse effects or potential conflicts with ISA objectives	--
Major adverse effects or potential conflicts with ISA objectives (widespread / large scale)	---
Mixed positive and negative	-/+
Uncertain	?

Cumulative effects

The assessment of cumulative effects considers:

- Additive or synergistic effects on ISA objectives and individual receptors arising from one or more of the options included within the IDP for delivery within 0-5 years (i.e. intra-plan cumulative effects)
- Additive or synergistic effects on individual ISA objectives and individual receptors arising from one or more of the options included within the IDP for delivery within 0-5 years and (a) sub-regional, county or local level plan and policies or (b) planned development within the study area (i.e. inter-plan cumulative effects).

For the purposes of the assessment of inter-plan cumulative effects, the following are defined as planned development:

- Nationally Significant Infrastructure Projects (NSIPs) listed on the Planning Inspectorate's register of projects (Planning Act 2008)
- Development of transport systems authorised by Transport and Works Act Order (Transport and Works Act 1992)
- Hybrid bills currently before Parliament
- Committed transport schemes identified in the draft IDP as schemes in the region that are either under construction, have planning consent or committed funding to take forward.

6.4 Assumptions and limitations

Assumptions

The assessment for the Transport Strategy is based on technical judgement, knowledge of similar measures and consideration of how the proposed measures are likely to be carried out and contribute or conflict with each ISA.

The assessment takes the procedures or legislative protection identified below into account and the standard good practice measures that are expected to be applied. These include:

Studies and Surveys

- Feasibility and scheme option studies aimed at avoiding adverse effects on designated sites and protected structures following Design Manual for Roads and Bridges (DMRB) and TAG requirements current at the time of scheme assessment.
- Studies, surveys and consultation on environmental and social effects of development proposed under the strategy and associated IDP

Standard good practice approaches are applied to design and construction

- Alignment/siting of new or improved infrastructure applying hierarchy of avoid, minimize, mitigate and compensate to keep adverse impacts to a minimum
- Identification of relevant mitigation expected to support consenting and licensing requirements
- Application of good practice approaches to construction and pollution management including appropriate supervision and control.

Operational management

- Measures to meet legal obligations during operational management of transport infrastructure or supporting measures, such as precautions for pollution prevention, safety during maintenance activities or meeting licensing requirements for protected species.

Limitations

The assessment of the draft Transport Strategy proposals is high-level and focused on how they support strategic objectives with the identification of appropriate mitigation measures aim to reduce uncertainty and risk so that intended outcomes are achieved.

The level of availability of public information on design and environmental impacts of priority interventions included in the draft IDP is variable. Locally designated areas were not consistently available for mapping across the region for example. Interventions range from ideas to well-developed schemes under preparation for funding. In many, cases however spatial extents, defined routes and sites are not known, or proposed measures are not fully defined. The level of uncertainty associated with the interventions is recorded for each intervention assessment. Mitigation measures are also identified to minimise uncertainty and risk for the interventions taken forward and are expected to be developed and assessed further at the project level.

7 Assessment of the Draft Transport Strategy

7.1 Strategy alternatives

As reported in the ISA Scoping report, as part of developing the draft Transport Strategy, a series of scenarios were considered and the results compared against the proposed wider outcomes and the four Strategic priorities (See Transport Strategy Evidence Base 1C Initial Future Scenarios: <https://www.transporteast.org.uk/consultation-documents>).

The purpose of the scenario development and testing procedure was to identify a set of possible futures for the region, to quantify these and then to explore their implications for the ability of the adopted Transport Strategy to deliver both the transport and wider regional outcomes. Economic, Spatial and Workplace assumptions underpinned a range of alternative potential outcomes for the Transport East area, see below:

Three Economic Trajectories

- **Central Trajectory** – The baseline economic trajectory for the local authority districts within the Transport East area, representing a “business-as-usual” case.
- **High Investment, High Housing Growth** – This trajectory is intended to represent the ambitions of the two LEP areas covering the region, with high levels of investment leading to growth in productivity, employment and GVA in key sectors, and regional housing needs being fully met.
- **Low Investment, Low Housing Growth** – This trajectory is intended to represent a situation in which both investment in the region and workers are lost to other areas of the UK who have taken more proactive steps to develop their region, resulting in a more pessimistic outlook for the East.

Two Spatial Scenarios

- **Centralised** – Urban growth rate doubled after Local Plan period (up to 2035) and rural growth rate scaled down accordingly - 52% of people living in the 13 largest urban areas.
- **Dispersed** – Urban growth rate halved after Local Plan period (up to 2035) and rural growth rate scaled up accordingly – 47% of people living in the 13 largest urban areas.

Two Workplace Scenarios

- **Back to normal** – Share of people working remotely by occupation will return to 2019 levels – 15% of people working remotely.
- **Remote** – Share of people working remotely by occupation will be 32% of people working remotely at least 50 % of the week.
(Note: remote working shares were calculated at an occupational level, hence changes to projected occupational composition also directly impacts the overall proportion of remote workers. Assumptions were based on a combination of workforce remote working data taken before and during the COVID-19 pandemic, and research by Adams-Prassl et. al into the likely future remote working potential¹⁸⁶)

The results of scenario testing have demonstrated that location of growth and take-up of remote working would affect the delivery of the “optimum economic vision” for the region.

For example, if future growth was more centralised (around urban areas), with high participation in remote working, the transport solutions might focus on local mode shift to sustainable modes. The other scenarios presented additional transport challenges, for example a dispersed growth trend, or return to higher long-distance commuting, could increase demand for car use, and alternative fuels may need to play a bigger role in decarbonisation.

In all scenarios, high levels of investment and growth would increase productivity, prosperity and wage levels within the region while remote working would offset the potential emissions from the impact of high growth and locating growth in urban areas would reduce car dependency.

Hybrids of all the scenarios could play out in the future, and it is recognised that the Strategy needs to be resilient and flexible to meet the needs of the region.

Transport East are looking to develop a clear delivery pipeline that sets out key actions / initiatives / schemes that are required under each of the four key themes to deliver the strategic actions of each pathway. In taking this approach there is flexibility to ensure that Transport East addresses the regional challenges, enables growth and is aligned to central Government's priorities. Table 7.1 shows the potential strategic approaches considered for each strategic priority.

Table 7.1: Transport East Emerging Pathway Activities

Strategic priorities	Potential Strategic Approaches Considered
Decarbonisation	<ul style="list-style-type: none"> ▪ Negative Carbon Developments: All development is located and designed to generate zero emissions from transport, and to facilitate the removal of carbon from the wider transport network. ▪ Substitute Trips: Trips are substituted through digital, transport and land use planning interventions. (Reducing the need to travel through working from home and online conferencing/meetings where working practices, employer and employee preferences and broadband connections allow. Working near home and integrating public transport and active travel links into new residential developments.) ▪ Shift Modes: Vehicle trips are reduced by switching modes to active and public transport, based on current UK best practice benchmarks. Under the 'additional target', trips are further reduced through increased mode shift to active and public transport, based on more ambitious assumptions that exceed current UK benchmarks. ▪ Switch Fuels: Private vehicles, public transport and freight switch to zero carbon fuels in line with the projected UK national pathway up to 2030.
Unlocking our International Gateways	<p>Ports:</p> <ul style="list-style-type: none"> ▪ Capacity and Reliability Improvements: Rail Capacity and journey time improvements for freight. ▪ Alternative Fuels: Charging and Hydrogen infrastructure plus electrification of rail routes. ▪ Mode Shift: HGV Shift to electrified rail or short sea shipping freight. Also, mode shift for employees. <p>Airports:</p> <ul style="list-style-type: none"> ▪ Improve connectivity to airports: Sustainable surface access to airports for passengers and employees. ▪ Mode Shift: Vehicle trips are reduced by switching to more sustainable modes based on current UK best practice benchmarks. ▪ Alternative Fuels: Both ground and air operations.
Re-energising our Rural and Coastal Communities	<ul style="list-style-type: none"> ▪ Getting people to places sustainably: Use of alternative fuels and vehicle trips are reduced by switching modes. The role of active modes to reduce car dependency can improve local health indicators and leisure and tourism opportunities. ▪ Getting services to people: Connectivity for businesses, and how transport accessibility and connectivity can assist deprivation levels in rural and coastal areas. Improving levels of rural/coastal accessibility via passenger transport facilities & rural hubs. ▪ Substitute transport trips with digital: Vehicle trips substituted through digital transport and land use planning. ▪ Connectivity of coastal areas: Improvement in connectivity and accessibility to coastal communities & economies.
Connecting our Growing Towns and Cities	<ul style="list-style-type: none"> ▪ Intra-Urban Connectivity & Accessibility: Connectivity between key attractors within the urban centres and corridors in the region. ▪ Inter-Urban Connectivity & Accessibility: Connectivity between key urban centres and corridors in the region, improving retention of skill and business sectors. ▪ Mode Shift: Vehicle trips are reduced by switching modes to active and public transport, based on current UK best practice benchmarks. The strategy needs to consider opportunities for modal shift to PT or active modes in urban and low-density residential areas.

The scenarios considered reflect the wider external factors influencing economic growth, employment, working patterns and how these might need to be supported by or be affected by approaches that can be taken by the Transport Strategy.

Three potential approaches to the development of activities included under the strategic priorities and associated pathways were considered during development of the draft Strategy:

- Focus primarily on promotion and facilitation of the use of alternative fuels.
- Focus primarily on promotion and facilitation of modal shift towards passenger transport and active travel modes.
- Combined approach to delivery including both promotion, encouraging use of alternative fuels and also modal shift towards passenger transport and active travel modes.

Table 7.2 assesses the three transport approaches considered during development of goals included within the strategic pathways as outlined in section 2.2 against the ISA objectives (see Table 6.3). The key elements of the assessment are as follows:

- **Alternative fuels** is assessed as having a mixed positive/negative impact on the population objective because electric vehicles (EVs) are expensive to purchase and run (particularly compared to public transport), and therefore this approach would have reduced potential for accessibility improvements for lower income households.
- **Modal shift** is assessed as having mixed positive/negative effects against the people and equalities objectives. This is because whilst passenger transport is cost effective relative to the use of private vehicles and can therefore be more accessible for low-income households, it can also be less accessible for people with disabilities unless their needs are appropriately accommodated. In addition, in less densely populated and rural areas demand may be insufficient for passenger transport options to be commercially viable. Also, journey distances may be too great for active travel, limiting the scope of connectivity improvements that could be achieved.
- **Combined approach** is assessed as addressing or to some extent balancing the potential negative impacts on accessibility from alternative fuels and modal shift.

All three potential approaches would reduce transport related carbon and air pollutant emissions, with direct positive effects against the climate and air ISA objectives and indirect positive effects against the biodiversity, water and natural capital ISA objectives. However, Approaches 2 and 3 would be likely to provide greater benefit against these ISA objectives than Approach 1 as alternative fuels can be used by a greater range of vehicle types including road freight.

New infrastructure construction required for alternative fuels (for example, a charging network for EVs) would be relatively small-scale local interventions. New infrastructure required to facilitate modal shift towards passenger transport and active travel modes could include potential to re-allocate existing road space. For this reason, a neutral effect is assessed against the landscape, heritage and soils and geology ISA objectives for all three approaches. However, where land take is associated with supporting modal shift there could be associated effects on biodiversity, landscape, heritage and soils and geology.

Modal shift towards the use of passenger transport and active travel under Approaches 2 and 3 is assessed as having an uncertain effect against the community safety objective. Whilst DfT road accident statistics¹⁸⁷ show that bus passengers have a lower casualty rate per mile than private vehicle passengers, walkers and cyclists do not. There is evidence to suggest that accident rates may decrease when the number of people undertaking active travel increases¹⁸⁸. Overall effects are likely to be dependent on how the approach is delivered and the degree of modal shift achieved. Nevertheless, a focus on passenger and active transport provides an opportunity to improve the quality of environment of existing and new supporting infrastructure through design such that perceptions of safety are improved.

Overall, Approach 3 (combined approach) performs best against the ISA objectives as it provides flexibility, and inclusivity, in the delivery of accessibility and connectivity improvements.

Table 7.2: Assessment of transport approaches against ISA objectives

Transport approaches		ISA objectives													
		Population	Equalities	Health	Safety	Biodiversity	Water	Air	Noise/vibration	Climate	Landscape	Heritage	Soils/geology	Material assets	Natural capital
1	Focus primarily on promotion and facilitation of the use of alternative fuels	+/-	+/-	+/0	0	+	+	+	0/+	+	0	0	0	+	+
2	Focus primarily on promotion and facilitation of modal shift towards passenger transport and active travel modes	+/-	+/-	+	+/0	+	+	+	0/+	+	0	0	0	+	+
3	Combined approach to delivery including both promotion and facilitation of the use of alternative fuels and also modal shift towards passenger transport and active travel modes	+	0	+	+/0	+	+	+	0/+	+	0	0	0	+	+

7.2 Draft proposed strategy

Wider outcomes

Table 7.3 provides an assessment of the draft Strategy wider outcomes against the ISA objectives, including an assessment of significance following inclusion of the ISA mitigation recommendations. Justification for the assessment of effects against ISA objectives for each of the seven wider outcomes is set out below.

- Wider Outcome 1 would have a positive impact on the **climate** objective as it supports reductions in carbon emissions. Wider Outcomes 4 and 7 also have potential for indirect positive impacts on the **climate** objective through facilitation of active travel modes and support for the sustainable energy sector.
- Potential for positive effect on the **population** and **equality** objectives are identified for Wider Outcomes 2 and 6 which would likely have a beneficial impact on employment and training opportunities and prosperity throughout the region.
- Wider Outcomes 2, 3, 4, 5 and 6 are considered likely to have potential for positive impacts on the **health** objective through support for wider determinants of health including access to work and education, healthcare services, housing and the natural environment, and also indirectly as a result of a positive effect on the safety objective under Wider Outcome 5 only.
- Wider Outcome 3 would have a neutral/positive effect on all objectives relating to the of the physical environment (i.e. **air, noise, biodiversity, water, landscape, heritage, material assets, soils/geology, natural capital**).
- Wider Outcome 4 would likely have positive or neutral impacts on the **landscape** and **material assets** objectives. However, the potential impacts of both Wider Outcomes 2 and 4 on the physical environment is dependent on how they are implemented. For this reason, the effects are assessed as uncertain for ISA objectives relating to the physical environment with the exception of the **landscape** and **material assets** objectives.
- Wider Outcome 5 could potentially have an indirect positive impact on the **biodiversity, air, noise** and **natural capital** objectives. For this to be the case, interventions would support modal shift and active travel including provision of recreational walking, cycling facilities and access to leisure facilities or outdoor recreation.

Table 7.3: Assessment of Transport Strategy wider outcomes

Wider outcomes		ISA objectives														ISA recommendations			
		Population	Equalities	Health	Safety	Biodiversity	Water	Air	Noise/vibration	Climate	Landscape	Heritage	Soils/geology	Material assets	Natural capital				
1	Reducing carbon emissions to net zero by 2040	0	0	+	0	0	0	0	+	0	+	0	0	0	0	0	0	0	<p>Acknowledgement of time frame for achievement of net zero emissions, which should meet or preferably better the Climate Act (2008) (2050 Target Amendment Order) 2019 target and interim targets included in relevant UK Government Carbon Budget</p> <p><i>Strategy response: wording amended to include 2040 time constraint</i></p>
2	Promoting active, healthy and safe lives for all	0	+	+	+	+/0	0	+/0	+/0	+/0	0	0	0	0	0	0	0	+/0	<p>'Promoting active, healthy and safe lives <i>for all</i> to increase emphasis on inclusivity of this statement</p> <p><i>Strategy response: proposed amendment accepted.</i></p>

Wider outcomes		ISA objectives													ISA recommendations		
		Population	Equalities	Health	Safety	Biodiversity	Water	Air	Noise/vibration	Climate	Landscape	Heritage	Soils/geology	Material assets		Natural capital	
3	Promoting and supporting a productive, sustainable and diverse economy	+	0	+	0	0	0	0	0	0	0	0	0	0	0	0	Amend to 'Promoting and supporting a productive, <i>sustainable</i> and diverse economy <i>Strategy response: proposed amendment accepted.</i>
4	Supporting access to education, training and employment opportunities for all	+	+	+	0	0	0	0	0	0	0	0	0	0	0	0	'Supporting access to education, training and employment opportunities <i>for all</i> to increase emphasis on inclusivity of this statement <i>Strategy response: proposed amendment accepted.</i>

Strategic priorities and goals under associated pathways

An assessment against the ISA objectives for all activities included under each of the four Transport Strategy strategic priorities and associated pathways are provided in the following subsections and tables:

- **Decarbonisation:** Net zero carbon emissions from transport by 2040, building on our status as the UK's premier renewable energy region –Table 7.5;
- **Connecting growing towns and cities:** Enhanced links between the fastest growing places and business clusters, improving access for people to jobs, supplies, services and learning; thereby enabling the area to function as a coherent economy with improved productivity – Table 7.6;
- **Energising rural and coastal communities:** A reinvented sustainable coast for the 21st century which powers the UK through energy generation. Supporting our productive rural communities and attracting visitors all year -Table 7.7; and
- **Unlocking international gateways:** Better connected ports and airports to help UK businesses thrive, boosting the nation's economy through better access to international markets and facilitating foreign direct investment – Table 7.8 and Table 7.9.

Mitigation and enhancement opportunities have been identified and a potential significance of effect assigned against each goal taking into account the mitigation measures identified in Table 7.4. The goal specific ISA mitigation measures identified against specific pathways and goals are outlined in the assessment tables (Tables 7.5 to 7.9). These mitigation measures will be implemented through the Sustainability Action Plan and Monitoring Plan (see Table 9.2).

Table 7.4: General ISA mitigation measures for the Transport Strategy

General ISA mitigation measures for the Transport Strategy
<p>The measures are to be implemented by Transport East and the Partners responsible for the individual schemes:</p> <ul style="list-style-type: none"> ▪ Strategy Goals and measures will be supportive of the Integrated Sustainability Assessment (ISA) Objectives ▪ Carbon emissions resulting from the construction, operation or implementation of goals and measures implemented under the four strategic pathways will overall lead to a net reduction in transport related carbon emissions within the TE region in line with the UK Government's 78% emissions reduction by 2030 and 2050 net zero targets. ▪ Policies, programmes and new infrastructure design will be inclusive in nature and reduce risk of transport (particularly) collisions, crime and anti-social behaviour. ▪ Where new infrastructure development required is required, the following general principles will apply where practicable: <ul style="list-style-type: none"> – Design will seek to minimise capital carbon emissions, will be compliant with PAS 2080:2016 and PAS 1878:2021 – Land take from designated or priority habitats, housing, commercial premises (including agricultural land holdings), heritage assets (including Registered Parks and Gardens) and valuable soils including Best and Most Versatile (BMV) agricultural land and peatland soils will be avoided – Risks of disturbance to wildlife (including protected species) and to unknown archaeology will be minimised – Infrastructure proposals will adopt context sensitive design and be sited to minimise negative impacts on landscapes, townscapes and visual amenity and on the setting of built heritage assets – Infrastructure will be designed and sited such that flood risk is not worsened, or preferably improved – Brownfield sites will be used in preference to greenfield land – Infrastructure will be designed for resilience to the latest likely worst case climate projections (currently considered to be UK Climate Projections 2018 (UKCP18) Representative Concentration Pathway (RCP) 8.5) – Statutory biodiversity net gain target of 10% across the IDP implemented consented schemes will be exceeded and for each individual consented scheme biodiversity net gain requirements will be met.

General ISA mitigation measures for the Transport Strategy

- New infrastructure development will be subject to environmental assessment, including Environmental Impact Assessment (EIA) (either statutory or non-statutory), and including Landscape and Visual Assessment (LVIA), Habitat Regulations Assessment (HRA), Water Framework Directive (WFD) compliance assessment, Flood Risk Assessment (FRA), Equalities Impact Assessment (EqIA) and Health Impact Assessment (HIA) as appropriate. These assessments will be undertaken at project level, and mitigation recommendations therein adhered to during construction and operation.

For each of the draft Transport Strategy strategic priorities, a number of goals are identified along with proposed actions to achieve them. These are assessed against the ISA objectives in the sections below.

Decarbonisation

- Goals 1 and 2 would have positive effects on the **population, socioeconomics** and **equalities** objectives arising from support for development of new housing in proximity to jobs. Improved public transport access would help support good quality of life and access to employment, education and other key community facilities. Support for improved road and rail digital connectivity would likely help improve access economic opportunities for residents of rural areas and address existing economic inequalities across the region.
- Goals 3 and 4 could potentially have negative effects on the **population** and **equalities** objective unless the ISA mitigation recommendations provided in Table 7.5 which seek to ensure that social groups who have more difficulty accessing active or passenger travel modes, or who may have more difficulty making accessing the EV market or making use of charging infrastructure, are catered for. This required that groups are not disadvantaged by private vehicle demand management measures. However, with the proposed ISA mitigation in place, effects on these objectives are assessed as neutral/positive.
- All goals are anticipated to have a positive or neutral/positive impact on the **air quality, climate, biodiversity and natural capital** objectives linked to reductions in carbon and transport related air pollutant (including NOx, PM and SO2) emissions. These would be achieved through modal shift away from the use of conventionally fuelled private vehicles and measures to reduce demand on the transport network.
- Modal shift and demand management may also reduce transport related noise emissions while modal shift towards EVs is anticipated to have a beneficial effect on traffic related noise emissions in urban areas. As a result, performance against the noise objective are assessed as neutral/positive for all goals.
- Impacts on the **landscape, heritage, soil/geology, material assets objectives** are assessed as neutral as new infrastructure required infrastructure required to support EV charging and digital connectivity roll out. This is likely to be small scale and predominantly located within the physical footprint of the existing transport network, and whilst reduced traffic movements on the highway network arising have potential for positive impacts on townscapes and built heritage assets there is currently no evidence to confirm that this impact would be significant.

Table 7.5: Transport Strategy strategic priority assessment: Decarbonisation pathway

Decarbonisation: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
<p>Goal 1: Zero carbon growth - by supporting authorities and developers to plan, locate and design new development that reduces the need for people to make carbon intensive transport trips in the future</p>			
<ul style="list-style-type: none"> ▪ Create a 'future network plan' and lead 'strategic corridor connectivity studies' to support local authorities with new evidence to: <ul style="list-style-type: none"> – Deliver new housing close to local jobs and essential services, and in areas with high levels of sustainable transport accessibility. – Complete reviews of planning applications to make sure associated transport proposals maximise opportunities supporting the use of alternatives to conventional motor vehicles, including electric vehicles and sustainable modes. ▪ Deliver a Future of Freight Plan to inform planning authorities, logistics businesses and their supply chains of the potential for consolidating freight transport at a strategic scale. ▪ Through our Decarbonisation Pathway and analytical framework, provide evidence and guidance to support local authorities and national government to strengthen carbon reduction requirements of Transport Assessments and Travel Plans for new developments in the East, including measures to reduce car dependency. 	<p>No amendments identified. Whilst the focus on supporting the use of alternatives to conventional motor vehicles and reducing car dependency requires consideration in terms of impacts on access to economic and social opportunities for low income households, people with disabilities and other social groups who are less able or less comfortable making use of alternative modes, these potential impacts are considered to be addressed via measures and ISA mitigation recommendations provided under Goal 3 and Goal 4 of this pathway.</p> <p><i>See Goals 3 and 4 for Strategy response.</i></p>	Population	+
		Equalities	0
		Health	0/+
		Safety	0/+
		Biodiversity	0/+
		Water	0/+
		Air	+
		Noise/vibration	0/+
		Climate	+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

Decarbonisation: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 2: Reduce demand for carbon intensive transport trips by local living and by making it easier for people to access services locally or by digital means			
<ul style="list-style-type: none"> ▪ Work in partnership with government, National Highways and Network Rail to improve digital connectivity along main roads and railways, using evidence from our strategic network and corridor studies ▪ Partner with the region's private sector to foster digital innovation, to make the best use of transport networks and discourage unnecessary travel at peak times. ▪ Coordinate with partners to make sure our Transport Strategy and Investment Programme fully aligns with and supports: <ul style="list-style-type: none"> – the Government and telecommunications providers' plans to roll-out ultra-fast broadband and 5G mobile in the region. – the work of our local authorities, developers, and telecommunications providers to embed improved digital connections in new developments across the region. 	<p>No amendments are identified to the goals in addition to the general ISA mitigation recommendations listed in Table 7.3.</p> <p><i>Strategy response: none required.</i></p>	Population	+
		Equalities	+
		Health	0/+
		Safety	0
		Biodiversity	0/+
		Water	0/+
		Air	0/+
		Noise/vibration	0/+
		Climate	0/+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

Decarbonisation: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 3: Shift modes - by supporting people to switch from private car to active and passenger transport			
<ul style="list-style-type: none"> ▪ Lead sub-national Active Travel, Bus and Rail action groups, and implement the recommendations of our bus and active travel strategies, to make sustainable transport easier to use and more attractive to people. ▪ Work with local authorities, government and businesses to deliver effective regional level public travel behaviour change campaigns, including Commute Zero. ▪ Create a new regional level analytical and modelling function to enhance the region's understanding of the barriers our communities face in shifting modes, where there is greatest potential for shift, and test new solutions. ▪ Lead input into the future UK national approach to paying for transport so it delivers the best outcomes. Build an evidence base and co-ordinate a regional level approach to traffic demand management measures to reduce private car use. 	<ul style="list-style-type: none"> ▪ Make specific reference to making sustainable transport options easier to use and more attractive for all people, including groups who may find active and public transport modes more challenging to make use of such as: <ul style="list-style-type: none"> – people with disabilities (including physical disabilities, intellectual disabilities, sensory disabilities and mental illnesses) – people with caring responsibilities who are more likely to be undertaking trip chaining journeys – groups who express greater levels of concern regarding personal safety when using active or passenger transport modes, including women disabled people and black and ethnic minority (BAME) individuals – shift workers and night workers. ▪ Commitment to consideration and mitigation of the potential differential impact on implementing demand management measures to reduce private car use on access to economic opportunities, community facilities and social opportunities for the groups listed in the bullet point above for whom active and passenger transport modes are less accessible. <p><i>Strategy response: Inclusion of 'A Strategy for everyone' within Chapter 4 Strategic Approach, measure SSA-GEN-2 within the Sustainability Action Plan and measures against the equalities objective within the draft Monitoring Plan.</i></p>	Population	0
		Equalities	0/+
		Health	0/+
		Safety	0/+
		Biodiversity	0/+
		Water	0/+
		Air	+
		Noise/vibration	0/+
		Climate	0/+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

Decarbonisation: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 4: Switch fuels - with all private, passenger transport, fleet and freight vehicles switching to net zero carbon fuels at the earliest opportunity			
<ul style="list-style-type: none"> Lead a region-wide Electric Vehicle infrastructure task force in collaboration with the Office for Zero Emission Vehicles, local authorities, neighbouring regions and other partners to accelerate the roll-out of charging infrastructure and identify the sub-regional actions need to unblock and speed delivery. Create a partnership with National Grid and UK Power Networks to make sure the roll-out of charging infrastructure in the East aligns with plans for upgrading electricity supply networks and is powered by clean energy sources. Coordinate partner organisations including Net Zero East, Hydrogen East, National Highways, Network Rail and local authorities to elevate and make the case for investment in the East to decarbonise vehicle fleets and networks, including operational fleets, buses, taxis, private hire, trains and freight. Accelerate the roll-out of ultra-rapid EV charging points on the Strategic Road Network, working with National Highways and using evidence from our strategic corridor connectivity studies. Work with government and partners to identify barriers to people and businesses switching fuels across our region and make the case for solutions that will work best in the East – potentially including plug-in grants for cars and financial incentives to support zero emission buses, taxis, private-hire and freight vehicles. 	<ul style="list-style-type: none"> Include commitment to provide support for the use of renewable energy sources in supporting electric vehicle charging supply networks Consider including new measure around supporting LTAs with electric vehicle charging infrastructure outwith the SRN and MRN. At home charging, or another alternative of equivalent convenience and which facilitates overnight charging, is likely to be key in facilitating the uptake of EVs, and approximately one third of residential dwellings in the UK do not have access to off-road parking. Consider including commitment to support plug in grants for wheelchair accessible taxis. People with mobility difficulties make three times more trips by taxi or private hire vehicle annually than those without mobility difficulties.¹⁸⁹ <p><i>Strategy response: Amendment to wording of second measure under this goal to specify clean energy sources, and to wording of fifth measure to include taxis and PHVs.</i></p>	Population	0
		Equalities	0
		Health	0/+
		Safety	0
		Biodiversity	0/+
		Water	0/+
		Air	+
		Noise/vibration	0/+
		Climate	+
		Landscape	0
		Heritage	0
		Soil/geology	0/+
		Material assets	0
		Natural capital	0/+

Connecting growing towns and cities

- All goals would have a positive or neutral/positive effect on the **climate** objective and neutral/positive impact on the **air** objective arising from support for modal shift towards passenger transport and active travel and reduced congestion on the Strategic Road Network (SRN) and Major Road Network (MRN).
- Support for increased physical activity levels through active travel, reduced risks of road collisions and reduced exposure to air and noise pollution would also all make a positive contribution towards the **health** objective.
- All goals are also assessed as having a positive or neutral/positive impact on the safety objective through support for pedestrian and cyclist prioritisation over traffic and better accommodation of sustainable travel modes within design, reduced congestion on the SRN and MRN and support for Brake's 'Vision Zero' initiative.
- Reduced transport air pollutant emissions would make a positive contribution to the biodiversity and soils/geology objective for Goals 5, 6 and 7, but where new highway and rail infrastructure is required to facilitate measures under Goal 6 then this is likely to have a negative impact on these objectives due to associated land take and disturbance and therefore effects are assessed as neutral/positive for Goals 5 and 7 and mixed positive/negative for Goal 6.
- Construction of new highway and rail infrastructure has potential negative impacts on **landscape, heritage, soils/geology, material assets and natural capital** objectives depending on how schemes are delivered. Potential positive impacts on the **soils/geology** objective could arise where brownfield sites are reused or opportunities for remediation are taken up. The **material assets and resources** objective may also benefit through the re-use of existing infrastructure, particularly EV charging on the SRN. Impacts on the **landscape and visual, cultural heritage, soils and geology, material assets and resources and natural capital and ecosystems services** objectives are highly dependent on the nature and location of any new infrastructure, and so a negative/neutral effect is assessed as a reasonable worst case outcome at strategy level for Goal 6.

Table 7.6: Transport Strategy strategic priority assessment: Connecting growing towns and cities pathway

Connecting growing towns and cities: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA Recomm.
Goal 5: Enhanced sustainable transport - improve connectivity within our towns and cities for walking, cycling and public transport to support sustainable access to services, education, training, employment and leisure			
<ul style="list-style-type: none"> ▪ Increase the capacity and capability of local authorities in urban areas to deliver a step-change in urban connectivity through: <ul style="list-style-type: none"> – Commissioning and providing enhanced regional level data and evidence to strengthen co-ordinated multi-modal transport plans – Developing a toolkit to help planners in the East design urban roads and streets prioritising sustainable modes, reflecting our region’s unique features ▪ Make the case for increased and stable funding for the development, construction, and maintenance of comprehensive walking and cycling networks in the East, supported by dedicated safe and inclusive infrastructure, high quality signage and wayfinding, and priority over traffic. ▪ Lead an action plan to identify and drive forward regional-level projects to complement Local Transport Authorities’ local Bus Service Improvement Plans, accelerating the delivery of comprehensive networks of accessible, high frequency ‘turn up and go’ bus services supported by real-time information and integrated cashless ticketing. ▪ Lead our sub-national Active Travel, Bus and Rail action groups, and implement the regional recommendations of our bus and active travel strategies, to make sustainable transport more accessible, easier to use and more attractive to all people. 	<p>Strategy should make specific commitment to ensuring public transport improvements and improvements to walking and cycling infrastructure will be made accessible for those with disabilities, people with caring responsibilities who are more likely to be undertaking trip chains or groups who express greater concern for personal safety when using public transport or undertaking active travel (including ethnic minorities and women), and how demand management measures will avoid disproportionate negative impacts on these groups.</p> <p><i>Strategy response – amendments to wording of second and fourth measures under this goal to emphasise inclusivity. Inclusion of ‘A Strategy for everyone’ within Chapter 4 Strategic Approach, measure SSA-GEN-2 within the Sustainability Action Plan and measures against the equalities objective within the draft Monitoring Plan.</i></p>	Population	+
		Equalities	0/+
		Health	0/+
		Safety	0/+
		Biodiversity	0/+
		Water	0/+
		Air	0/+
		Noise/vibration	0/+
		Climate	+
		Landscape	0/+
		Heritage	0
		Soil/geology	0
		Material assets	0
Natural capital	0/+		
Goal 6: Faster and more reliable transport connections - between growing towns and cities - deliver faster and more reliable transport connections between our growing towns, cities and economic corridors and to the rest of the UK, to support business growth, skills development and employment			

Connecting growing towns and cities: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA Recomm.
<ul style="list-style-type: none"> Lead regional network analysis and corridor connectivity studies to present a new and compelling case for investment in existing and future priorities on our strategic corridors Lead strategic thinking on the enhanced role of rail in the East to 2050, through the formation of a Transport East Rail Task Group Enhance the business cases for investment in our rail priorities in the East and accelerate delivery of our priorities, including proposals to deliver faster and more capacity on the Great Eastern Mainline, West Anglia Main Line, Thameside Line, and the Eastern Section of the East West Rail (EWR) Main Line between Oxford and the Transport East region Work with National Highways and local authorities to enhance the case for investment in and maintenance of our high priority road network connections to deliver reliable, fast and safe journeys, including the A47, A14, A11, A120, A12, A13, A127, M25 and M11 Lead new thinking on the future use of roads in the region, including unlocking game-changing Rapid Passenger Transit networks, autonomous vehicles, shared transport and integration with other modes and technologies, to ensure users of our road network are collectively achieving our decarbonisation and economic growth goals. 	<p>Include emphasis on sustainable future use of roads in the region.</p> <p>Goal includes use of existing infrastructure and also potential new infrastructure -see ISA mitigation recommendations to minimise impacts from these and also opportunities to consider early in design or for maintenance (for example changing verge cutting regimes to enhance biodiversity).</p>	Population	0/+
		Equalities	0
		Health	0/+
		Safety	0/+
		Biodiversity	+/-
		Water	+/-
		Air	0/+
		Noise/vibration	?
		Climate	0/+
		Landscape	0/-
		Heritage	0/-
		Soil/geology	0/-
		Material assets	+/-
Natural capital	+/-		
<p>Goal 7: Fully integrated transport - networks with customers at the heart – fully integrated services and operations, through a customer focused approach, enabling seamless and safe end-to-end journeys by sustainable modes that are attractive to all people</p>			
<ul style="list-style-type: none"> Work with local authorities in the region to ensure that multi-modal transport plans for urban areas are developed along user-centric lines, considering the needs of different groups, provision of services, door-to- 	<ul style="list-style-type: none"> Include specific reference to support for reducing road danger and road collision rates for vulnerable groups including children (particularly in areas of high deprivation), pedestrians and cyclists. 	Population	+
		Equalities	0/+
		Health	+

Connecting growing towns and cities: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA Recomm.
<p>door journeys, and the role of transport in creating high-quality public spaces.</p> <ul style="list-style-type: none"> Coordinate with partners, including the police, to promote and make the case for a greater investment in a Vision Zero 'safer systems' approach to eliminating road danger across the region. Lead our sub-national Active Travel, Bus and Rail action groups, and implement the regional recommendations of our bus and active travel strategies, to make sustainable transport easier to use and more attractive to people. 	<ul style="list-style-type: none"> Mitigation recommendation relating to bus and active travel strategies as outlined against Goal 1. <p><i>Strategy response: Measure S3 against Safety objective within the draft Monitoring Plan. Also see Strategy response to Goal 1.</i></p>	Safety	+
		Biodiversity	0/+
		Water	0/+
		Air	0/+
		Noise/vibration	0/+
		Climate	0/+
		Landscape	0/+
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

Energising rural and coastal communities

- Effects upon the **population** and **equalities** objectives are assessed as positive or neutral/positive for both goals as a result of support for transport and digital connectivity for rural populations and the benefits that these bring in terms of access to economic opportunities and reduce inequalities. The **health** objective is also assessed as neutral/positive for both goals as support for delivery of demand responsive public transport services and 'lifeline' bus routes would likely improve access to healthcare, community facilities and social and leisure opportunities in isolated areas. Improvements to the public rights of way network and East of England coastal path will also support increased rates of physical activity through increasing the attractiveness of outdoor recreation and potentially also contribute to active travel.
- Support for the transition to electric vehicles in rural and coastal areas, development of Bus Service Improvement Plans, demand responsive public transport and PRoW network improvements under Goal 8 would help reduce transport carbon and air pollutant emissions, and therefore a neutral/positive effect is assessed against the climate, air, biodiversity and soil/geology objectives is assessed.
- Should new rail infrastructure (or other types of new infrastructure as identified as necessary under the Coastal Connectivity Sub-National Action Plan) be required under Goal 9 then there is potential for negative impacts on the **biodiversity, noise, landscape, heritage, soils/geology** and natural capital objectives depending on design and routing (the detail of which is not available at Strategy level).
- Water based transport also could have negative impacts on biodiversity and landscape objectives depending on the nature and location of the proposals (the detail of which is not available at Strategy level). For this reason, the effects against the **biodiversity, water and natural capital** objectives are assessed as mixed positive/negative and effects against the **landscape, heritage, soils/geology** and **material assets** objectives are assessed as negative/neutral at Strategy level as a reasonable worst-case assessment.

Table 7.7: Transport Strategy strategic priority assessment: Energising rural and coastal communities

Energising rural and coastal communities: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recom m.
Goal 8: Increasing accessibility to education, training, services and employment for rural and coastal communities			
<ul style="list-style-type: none"> Create a Centre of Excellence for Rural Mobility in the East, to make the case for investment in our rural and coastal communities and tackle regional and national blockers to better more inclusive rural transport services Lead and co-ordinate the English Sub-national Transport Bodies to champion rural outcomes with national government. Establish a sub-national EV task force to support local authorities across the East to unblock and accelerate the roll-out of charging infrastructure in rural and coastal communities, powered by clean energy. Lead an action plan to drive forward regional projects to maximise the benefits from Local Transport Authorities' local Bus Service Improvement Plans – tackling integrated ticketing, cross-border travel, and financial sustainability. Showcase our local authorities' and LEP transport innovation in rural communities through a best practice guide and develop a strategic business case to scale-up, fund and roll-out more rural transport innovation across the region including demand responsive transport and access to skills and training for young people in rural areas. Through our Sub-national Active Travel Strategy, set out the East's unique case for investment and investment in walking and cycling infrastructure for all people in rural and coastal areas, encouraging more active lifestyles and integrating with regional tourism and health strategies. Lead strategic co-ordination with local authorities to plan and make the case for investment regional active travel networks (walking, cycling and rights of way). 	<ul style="list-style-type: none"> Strategy should make specific reference to support for increasing the accessibility of the rights of way network for people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory disabilities and mental illness). Consider including targets relating to improving access to healthcare facilities by active travel and public transport modes. <p><i>Strategy response: amendments to wording of goal to emphasise inclusiveness for measures relating to public transport, walking and cycling. Measure P2 against Population objective within draft Monitoring Plan.</i></p>	<p>Population</p> <p>Equalities</p> <p>Health</p> <p>Safety</p> <p>Biodiversity</p> <p>Water</p> <p>Air</p> <p>Noise/vibration</p> <p>Climate</p> <p>Landscape</p> <p>Heritage</p> <p>Soil/geology</p> <p>Material assets</p>	<p>+</p> <p>0/+</p> <p>0/+</p> <p>0</p> <p>0/+</p> <p>0/+</p> <p>0/+</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>

Energising rural and coastal communities: Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recom m.
		Natural capital	0
Goal 9: Improving connectivity along our coastline - and connect our coastal towns and communities to the rest of the UK, to support levelling up			
<ul style="list-style-type: none"> Evaluate and promote the transport needs of our coastal towns as part of our strategic network plan and corridor studies, to improve sustainable connections from our coast with the rest of the region and the UK Work with government and Network Rail to prioritise the next generation of investment in rail to connect coastal communities. Through our new Rail Group, work with government and Network Rail to prioritise investment in rail to better connect our coastal communities with the rest of our region and the UK. Co-ordinate our partners and local authorities to establish an investment programme to tackle severance and level-up communities along our 500-mile coastline, identifying the best value and most sustainable projects potentially including water-based transport for coastal communities and the East of England coastal path. 	<p>Strategy should commit to exploring and developing sustainable transport modes in fulfilling the identified coastal connection needs.</p> <p><i>Strategy response: amendments to wording of first measure.</i></p>	Population	+
		Equalities	0/+
		Health	0/+
		Safety	0/+
		Biodiversity	+/-
		Water	+/-
		Air	0/+
		Noise/vibration	?
		Climate	0/+
		Landscape	0/-
		Heritage	0/-
		Soil/geology	0/-
		Material assets	0/-
Natural capital	+/-		

Unlocking international gateways – Ports

- Goal 10 is assessed as having mixed positive/negative effects against the **health, biodiversity, water, air, noise, material assets** and **natural capital** objectives. Whilst measures to consider options for reducing road freight and support a reduction in freight related issues of congestion would help reduce carbon, air pollutant and noise emissions associated with freight movement. Measures to support new highway and ro-ro freight park construction has potential for negative effects on these objectives and also on the **landscape, heritage, soil/geology** and **material assets** objectives due to land take as well as changes in traffic patterns and induced land use change (particularly in proximity to ro-ro freight parks). Effects against the **population** objective are assessed as positive through support for local and regional economies.
- Goal 11 is assessed as having positive or neutral/positive effects on the **health, biodiversity, water, air, climate** and **natural capital** objectives associated with support for the decarbonisation of the freight industry, which would help reduce transport-related emissions of air pollutants such as NO₂ as well as reducing carbon emissions. No significant impacts on other objectives are anticipated under Goal 11.
- Measures under Goal 12 to improve rail and other sustainable transport connections to ports, establish rail freight hubs at ports with existing rail infrastructure and promote an expansion of short sea shipping could help reduce carbon emissions associated with freight transport with positive effect on the **climate** objective. Measures to promote modal shift towards short sea shipping and manage demand on the local road network surrounding ports under Goal 12 could potentially have a positive impact on the **safety** objective by reducing the risk of road collisions.
- Modal shift towards short sea shipping has potential for positive effects against the **air, noise, biodiversity** and **natural capital** objectives through reduced air pollutant emissions from land-based transport. However increased shipping can also increase risk of marine pollution and noise disturbance to marine fauna.
- Short sea shipping (including construction of new supporting infrastructure) and new rail infrastructure (if required) could also potentially have a negative impact on these objectives and also the **landscape, heritage** and **material assets** objectives associated with air and noise pollutant emissions, land take, ground disturbance, water pollution, habitat severance and disturbance to wildlife and noise and views of new infrastructure. ISA mitigation has been identified to minimise the impact of these potential negative impacts, however at the Strategy level there is uncertainty on the likelihood of ISA mitigation successful delivery. For this reason, the significance of effect on these receptors is assessed as neutral/negative with ISA mitigation in place.

Table 7.8: Transport Strategy strategic priority assessment: Unlocking international gateways (Ports)

Unlocking international gateways (Ports) Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 10: Better access - improve capacity, journey time and reliability for freight and passenger surface access to ports			
<ul style="list-style-type: none"> Make the case for investment to ensure road improvement projects facilitating freight flows are prioritised through programmes such as the Roads Investment Strategy. Lead the development of a regional Future of Freight plan to identify high priority network solutions and consider options for reducing freight demand on the road network. Produce key corridor studies to support the development of freight parks to better manage the flow of HGVs and reduce congestion on roads. 	<ul style="list-style-type: none"> Qualification of support for road improvement schemes – sustainable freight modes should be prioritised wherever practicable. Freight parks to be located on brownfield sites wherever practicable, air quality and noise assessments undertaken to ensure no unacceptable impacts on local sensitive receptors. <p><i>Strategy response: SEA monitoring plan includes the development of targets relating to the use of brownfield sites and use of noise and air quality modelling to inform site selection and identify appropriate mitigation where required.</i></p>	Population	+
		Equalities	0
		Health	+/-
		Safety	0/+
		Biodiversity	+/-
		Water	+/-
		Air	+/-
		Noise/vibration	+/-
		Climate	+/-
		Landscape	0/-
		Heritage	0/-
		Soil/geology	0/-
		Material assets	0/-
		Natural capital	+/-

Unlocking international gateways (Ports) Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 11: Alternative fuels -support ports and freight sector to increase their use of alternative fuels through supporting infrastructure, electrified/hydrogen rail routes and road vehicles, and supporting innovation in new and emerging fuels			
<ul style="list-style-type: none"> Lead strategic thinking and develop evidence to accelerate hydrogen and EV infrastructure across the East Engage regionally and nationally with logistics businesses and HGV operators to promote the transition to low carbon freight. Collaborate with local authorities, the freight industry, and government to provide a regional voice at national level, to make the case for further financial support to incentivise operators to transition to new zero emission vehicles. Collaborate with local partners to promote the acceleration of research and development into alternative fuels for ports and freight transport, supporting the export of best practice to boost the regional economy. 	<p>No amendments identified</p> <p>ISA Recommendation - See Section 9 Sustainability Action Plan: SSA GEN 5</p>	Population	0
		Equalities	0
		Health	0/+
		Safety	0
		Biodiversity	0/+
		Water	0/+
		Air	+
		Noise/vibration	0
		Climate	+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

Unlocking international gateways (Ports) Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 12: Shift Modes - modal shift of freight from road to rail or short sea shipping and increase sustainable transport by port employees and passengers			
<ul style="list-style-type: none"> Through the Transport East Rail Task Group, work in partnership with government, Network Rail and other Sub-national Transport Bodies to secure improvements to the rail network serving major ports, tackling constraints affecting our region. Work with major ports with existing rail connections to establish rail freight hubs to help improve sustainable connectivity for local businesses and smaller ports to support mode shift. Work with ports and logistics businesses both within the region and around the UK (particularly along the north east coast) to promote an expansion of short sea and coastal shipping. Promote the improvement of passenger rail services to ports with significant ferry/cruise services, and support initiatives to better integrate rail-sea travel. Work with Local Authorities and port operators to improve sustainable connections to ports for staff alongside initiatives to encourage take-up and manage demand on the local road network. 	<ul style="list-style-type: none"> Inclusion of commitment to support development of rail freight hubs on brownfield sites Inclusion of commitment to improve accessibility of passenger rail services for people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory disabilities and mental illness) Inclusion of commitment to ensure sustainable transport connections for staff accessing ports are accessible for people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory disabilities and mental illness) and include suitable active travel options as well as public transport. Inclusion of commitment to support development of, and promote use of, low emission shipping fuels. <p><i>Strategy response: Inclusion of 'A Strategy for everyone' within Chapter 4 Strategic Approach, measure SSA-GEN-2 within the Sustainability Action Plan. Draft Monitoring Plan includes development of a target relating to use of brownfield land for new developments (M2). Sustainability Action Plan measure SSA-GEN-6.</i></p>	Population	0/+
		Equalities	0/+
		Health	0/+
		Safety	0/+
		Biodiversity	+/-
		Water	+/-
		Air	+/-
		Noise/vibration	+/-
		Climate	0/+
		Landscape	0/-
		Heritage	0/-
		Soil/geology	0/-
		Material assets	0/-
Natural capital	+/-		

Unlocking international gateways – Airports

- All goals under this strategic pathway would have a neutral/positive or neutral impact on the **population** and **equalities** objectives. Goals 14 and 15 are assessed as having a positive or neutral/positive impact on the **health, climate, air, biodiversity** and **water** objectives associated with measures for low or zero carbon fuels for aircraft and vehicles supporting airport operation. It also supports modal shift towards public transport and active travel for staff and passengers travelling to and from airports.
- Measures to improve rail and coach connectivity to airports under Goal 13 would also have a positive or neutral/positive impact on the **health, safety, climate, air, biodiversity, soils/geology** and **natural capital** objectives. However other measures under this goal such as extending the West Anglia main line upgrades, extending the EWR east of Cambridge and also initiatives to address significant road network pinch-points have potential for negative impacts on these and upon the **landscape, heritage** and **material assets** objectives due to changing traffic patterns and land take. The likelihood and significance of such negative effects are highly dependent on the scale, location and nature of interventions and therefore the effects are assessed as mixed positive/negative for the **biodiversity, soils/geology** and **natural capital** objectives at Strategy level and neutral/negative for the **material assets, landscape** and **heritage** objectives. ISA mitigation has been identified to minimise the risk of negative impacts arising.

Table 7.9: Transport Strategy strategic priority assessment: Unlocking international gateways (Airports)

Unlocking international gateways - Airports Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 13: Enhanced connectivity to airports - improve connectivity to airports for passengers and employees through better connected and more sustainable options.			
<ul style="list-style-type: none"> ▪ Collaborate with Government, airport operators and local authorities to strengthen accessible rail connections to all our airports including upgrades to the West Anglia Main Line and extending East West Rail east of Cambridge. ▪ Work with airport operators and local authorities to improve bus and coach networks to support staff and passenger trips to and from airports. ▪ Support initiatives to address significant road network pinch-points around airports, exploring the potential for incorporating more bus priority in the process. ▪ Work with government, the airport operator and local partners to explore ways of improving rail freight capacity at Stansted Airport. 	<ul style="list-style-type: none"> ▪ Inclusion of commitment of consideration of accessibility of rail connections to airports for people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory disabilities and mental illness) and the perceived safety of rail travel for people travelling late at night and early in the morning (particularly groups who feel less safe on public transport such as BAME individuals¹⁹⁰¹⁹¹, disabled people and women¹⁹²¹⁹³). ▪ Goal 4 of the decarbonisation pathway includes measures to support the rail decarbonisation, and therefore no additional ISA mitigation recommendations are identified against this goal. <p><i>Strategy response: revision to wording of first measure under this goal. Inclusion of 'A Strategy for everyone' within Chapter 4 Strategic Approach</i></p>	Population	0/+
		Equalities	0/+
		Health	0/+
		Safety	0/+
		Biodiversity	+/-
		Water	+/-
		Air	0/+
		Noise/vibration	0/-
		Climate	0/+
		Landscape	0/-
		Heritage	0/-
		Soil/geology	+/-
		Material assets	+/-
		Natural capital	+/-

Unlocking international gateways - Airports Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
Goal 14: Net Zero aviation emissions - support the Government and aviation industry to deliver net zero emissions by 2050 airports			
<ul style="list-style-type: none"> Work with airport operators and local authorities to ensure that measures are in place at airports to encourage the use of EVs powered by clean energy sources. Work with bus and coach operators and logistics businesses to promote the use of alternative fuels for vehicles serving airports. Support the Government's Jet Zero approach to eliminate carbon emissions from aviation and promote research and development of alternative fuels in the region, including for aircraft and ground transport operations. 	<ul style="list-style-type: none"> Inclusion of commitment to support EV charging at airports powered by renewable energy sources as far as practicable (in line with mitigation recommendations under goal 4 of the decarbonisation pathway to support prioritisation of renewable energy sources within the EV charging infrastructure. <p><i>Strategy response: wording of first measure under goal amended.</i></p>	Population	0
		Equalities	0
		Health	0/+
		Safety	0
		Biodiversity	0
		Water	0
		Air	0/+
		Noise/vibration	0
		Climate	+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+
Goal 15: Shift Modes - supporting passengers and employees to access our airports by sustainable transport such as by bus or train.			
<ul style="list-style-type: none"> Promote the improvement of public transport services and infrastructure to and from our airports to provide more and more accessible travel options for passengers. 	<ul style="list-style-type: none"> Commitment to helping facilitate active travel and bus services connecting airports and residential areas that are accessible for people with disabilities people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory 	Population	0/+
		Equalities	0
		Health	0/+

Unlocking international gateways - Airports Goals	Goal specific ISA recommendations (and Strategy response)	Assessment	
		ISA Objective	Post-ISA recomm.
<ul style="list-style-type: none"> Work with local authorities and airport operators to provide better and inclusive active travel and bus routes connecting airports and their business clusters with nearby residential areas, to encourage employees to shift modes. Support airport operators with developing Airport Surface Access Strategies with ambitious mode share targets, considering the potential for complementary measures to encourage all people to shift mode. 	<p>disabilities and mental illness) and are perceived as safe and convenient by staff travelling late at night and in the early hours of the morning (particularly groups who feel less safe on public transport such as BAME individuals¹⁹⁴, disabled people and women).</p> <ul style="list-style-type: none"> Support for the use of zero or low emission buses for airport access. Airport Surface Access Strategies to include specific consideration of accessibility needs of people with disabilities. people with disabilities (including physical disabilities which limit mobility, intellectual disabilities, sensory disabilities and mental illness) can be accommodated in desired modal shift targets. <p><i>Strategy response: amendments to wording of all three measures under this goal to emphasise inclusivity and accessibility. Inclusion of 'A Strategy for everyone' within Chapter 4 Strategic Approach</i></p>	Safety	0/+
		Biodiversity	0/+
		Water	0/+
		Air	+
		Noise/vibration	?
		Climate	+
		Landscape	0
		Heritage	0
		Soil/geology	0
		Material assets	0
		Natural capital	0/+

7.3 Cumulative effects

Table 7.10 sets out the intra-plan and inter-plan cumulative effects identified for the Transport Strategy against each ISA objective. In summary, key likely residual intra-plan and inter-plan cumulative effects are:

- Positive cumulative effects against the **population, equalities** and **climate** objectives resulting from support for reduced transport related carbon emissions and increased access and equity of access to economic opportunities
- Neutral/positive effects against the **health, safety, air** and **noise** objectives associated with support for reductions in transport related air pollutant and noise emissions, road collisions and increased physical activity levels as a result of direct and indirect improvements to opportunities for active travel
- Mixed positive/negative effects against the **biodiversity, water** and **natural capital** objectives and neutral/negative effects against the **landscape, heritage, soil/geology** and **material assets** objectives. Potential positive effects against the **biodiversity, water** and **natural capital** objectives are associated with goals which support reductions in air pollutant emissions, and potential negative effects against the **biodiversity, water, natural capital, landscape, heritage, soil/geology** and **material assets** objectives would be associated with goals and measures requiring significant new infrastructure construction where there is potential for land take and severance.

Table 7.10: Intra-plan and inter-plan cumulative effects with Transport Strategy

ISA objective	Intra-plan cumulative effects	Inter-plan cumulative effects
Population	<p>Cumulative positive effect – nine goals under the four strategic priority pathways assessed as having positive impacts associated with improved access to economic and social opportunities.</p> <p>ISA mitigation recommendations include consideration of how measures to support promote the use of alternatives to convention vehicles, such EVs, passenger transport and active travel, can ensure inclusivity for where for certain social groups including low income households, shift workers and night workers. With ISA mitigation in place, overall neutral/positive effect.</p>	<p>Cumulative positive effects associated with other plans and strategies which seek to improve access to economic and social opportunities in the TE region and within commutable distances of the TE region including:</p> <ul style="list-style-type: none"> ▪ Transport Investment Strategy¹¹ ▪ Roads Investment Strategy: 2020-2025 (RIS2)¹⁹⁵ ▪ Bus Back Better: National Bus Strategy for England²² ▪ Norfolk Local Transport Plan 4 Strategy 2021-2036¹⁹⁶, Suffolk Local Transport Plan 2011-2031 – Part 1 ¹⁹⁷, Essex Local Transport Strategy: the Local Transport Plan for Essex¹⁹⁸, Southend-on-Sea Local Transport Plan 2012-2026¹⁹⁹, Thurrock Transport Strategy 2013-2026²⁰⁰ ▪ New Anglia Local Enterprise Partnership (LEP) Economic Strategy for Norfolk and Suffolk²⁰¹, draft Local Industrial Strategy²⁰² and emerging Economic Recovery Renewal Plan²⁰³. South-East LEP Economic Recovery and Renewal Strategy²⁰⁴ ▪ regional transport strategies produced by neighbouring sub-national transport bodies (England’s Economic Heartland transport strategy²⁰⁵ and The Mayor’s Transport Strategy 2018²⁰⁶)
Equalities	<p>Cumulative positive effect –ISA mitigation recommendations include consideration of how measures to support promote the use of alternatives to convention vehicles, passenger transport and active travel, can ensure inclusivity for groups who have move</p>	<p>Positive cumulative effects associated with:</p> <ul style="list-style-type: none"> ▪ improved access to transport for people with disabilities in combination with measures implemented under The Inclusive Transport Strategy: Achieving Equal Access for Disabled People¹⁷ and with the regional

ISA objective	Intra-plan cumulative effects	Inter-plan cumulative effects
	difficulty accessing passenger transport and active travel modes including people with disabilities (including physical disabilities, intellectual disabilities, sensory disabilities and mental illness, women and BAME individuals. With ISA mitigation in place, overall neutral/positive effect.	<p>transport strategies produced by neighbouring sub-national transport bodies (England's Economic Heartland transport strategy²⁰⁷ and The Mayor's Transport Strategy 2018²⁰⁸)</p> <ul style="list-style-type: none"> improved transport connectivity to rural and coastal areas, which will help support equality of access to economic opportunities in combination with Norfolk Local Transport Plan 4 Strategy 2021-2036¹⁹⁶ improved digital connectivity in rural and coastal areas, which will help support equality of access to economic opportunities in combination with Together for Norfolk²⁰⁹, and the Economic Strategy for Norfolk and Suffolk²⁰¹
Health	Cumulative neutral/positive effect – positive effects predominantly associated with reduced air pollutant emissions arising from support for modal shift towards sustainable transport modes and low or zero carbon fuels. An increase in physical activity levels which would be indirect impact of modal shift towards public transport and also direct impact of support for improvements to the RoW infrastructure.	<p>Positive cumulative effects associated with reduced air pollutant emissions as described against the air objective below and with support for increased physical activity levels in conjunction with:</p> <ul style="list-style-type: none"> Support for improvements to the Strategic Road Network (SRN) under RIS 2¹⁹⁵ Essex Joint Health and Wellbeing Strategy 2018-2022²¹⁰, Norfolk's Living Well: A public health strategy for Norfolk 2016-2020²¹¹, Health and Wellbeing in Suffolk: Joint Health and Wellbeing Board Strategy Refresh 2019-2022²¹² local (county) level walking and cycling plans strategies (potential for cumulative effects considered in further detail within the assessment for the IDP).
Safety	Cumulative neutral/positive effect – primarily associated with measures to reduce demand on the highway network or reduce congestion, and also with measures specifically targeting road safety improvements under connecting growing towns and cities pathway goal 3.	<p>Positive cumulative effects in combination with other plans and strategies which aim to reduce road collisions and increase safety on public transport including:</p> <ul style="list-style-type: none"> Support for increased road safety on the SRN under the RIS2¹⁹⁵ Draft Vision Zero Strategy Document²¹³ Measures to improve actual and perceived safety on the bus network under Bus Back Better: National Bus Strategy for England²² Local transport plans as listed against the Population objective
Biodiversity	Cumulative mixed positive/negative effect – goals including measures to promote modal shift from private transport to public transport and active travel, from road freight to rail freight or short sea shipping and promote the use of low or zero carbon fuels for private vehicle and HGVs, as well as within the rail sector and for air travel and air travel related goals.	Overall cumulative effects would be mixed positive/negative. Positive cumulative effects associated with plans and strategies which seek to reduce transport related air pollutant emissions as set out against the Air ISA objective below. Potential negative cumulative effects with other plans and strategies which promote significant new infrastructure construction likely to necessitate land take or disturbance from terrestrial or aquatic habitats and/or from areas of flood plain:
Water		
Natural capital		

ISA objective	Intra-plan cumulative effects	Inter-plan cumulative effects
	<p>However, where new infrastructure construction is required and/or where modal shift towards short sea shipping is proposed under the connecting towns and cities pathway goal 2, unlocking international gateways: ports goals 1 and 3 and unlocking international gateways: airports goal 1, then negative impacts on the biodiversity, water environment and natural capital and ecosystems services objectives are anticipated associated with land take or disturbance to habitats and wildlife (including protected species).</p>	<ul style="list-style-type: none"> ▪ Transport Investment Strategy¹¹ ▪ Suffolk Rail Prospectus²¹⁴ ▪ Local transport plans as listed against the Safety ISA objective above ▪ Build Back Better: our plan for Growth²¹⁵, New Anglia LEP draft Local Industrial Strategy²⁰² and South-East LEP Economic Recovery and Renewal Strategy²⁰³ ▪ National and county level waste and minerals plans and policy ▪ Regional water resource management plans ▪ Local plans <p>Note: cumulative impacts between specific plans or projects will be assessed in relation to the interventions proposed in the IDP (see section 8.3).</p>
Air	<p>Cumulative neutral/positive effect – in the longer term strategy goals including measures to promote modal shift from private transport to public transport and active travel and from road freight to rail freight or short sea shipping and promote the use of low or zero carbon fuels for private vehicle and HGVs, as well as within the rail sector and for air travel and air travel related goals would all have a positive impact on these objectives.</p> <p>In the shorter term, goals promoting the construction of transport infrastructure to alleviate immediate issues of congestion or access are likely to have an initial negative impact against these objectives associated with induced demand and embodied carbon emissions, however over the lifetime of the strategy the net impact is anticipated to be positive.</p>	<p>Mixed positive/negative cumulative effects. Positive cumulative effects associated with:</p> <ul style="list-style-type: none"> ▪ Plans and strategies which aim to reduce transport related carbon emissions as set out below against the climate objective. ▪ Clean Air Strategy 2019¹⁵ ▪ Local air quality action plans <p>Negative cumulative effects associated with embodied carbon emissions associated with new infrastructure construction under other national and regional level plans relating to other infrastructure sectors (e.g. energy, housing, water resource, communications, waste).</p>
Climate	<p>Goal 10 under the unlocking international gateways: ports pathway and goal 13 under the unlocking international gateways: airports pathway are assessed as having potential for negative impacts on air quality and climate arising from support for road improvement projects that facilitate freight flows or which facilitate access to airports for private vehicles in particular. This may lead to induced demand and undermine other goals and measures which seek to support modal shift towards lower carbon alternatives.</p>	<p>Positive cumulative impacts on climate mitigation associated with other plans and strategies which aim to reduce transport related carbon emissions at national level as well as within the TE region including:</p> <ul style="list-style-type: none"> ▪ The Clean Growth Strategy²¹⁶ ▪ Decarbonising Transport: A Better, Greener Britain²¹⁷ ▪ Norfolk Climate Change Strategy²¹⁸ ▪ Suffolk Climate Emergency Plan²¹⁹ ▪ Net Zero: Making Essex Carbon Neutral²²⁰ ▪ Regional level transport plans (England's Economic Heartland Transport Strategy: Connecting People, Transforming Journeys²⁰⁷, Midland's Connect Strategy 2017²²¹, The Mayor's Transport Strategy 2018²⁰⁸, Transport for the North Strategic Transport Plan²²², Transport Strategy for the South East²²³ and the Western Gateway Strategic Transport Plan 2020-2025²²⁴ <p>Positive cumulative impacts on climate resilience of transport infrastructure in conjunction with:</p> <ul style="list-style-type: none"> ▪ Norfolk's Transport Asset Management Plan 2020/21²²⁵ ▪ Suffolk Climate Action Plan 22²²⁶

ISA objective	Intra-plan cumulative effects	Inter-plan cumulative effects
Noise/vibration	Cumulative neutral/positive effect - goals including measures to promote modal shift from private transport to public transport and active travel and from road freight to rail freight or short sea shipping and promote the use of low or zero carbon fuels for private vehicle and HGVs, as well as within the rail sector and for air travel and air travel related goals would all have a positive impact on this objective. Potential localised negative impacts have been identified for objective 3 under the decarbonisation pathway and objectives 1 and 3 under the unlocking international gateways: ports pathway which are associated with changing traffic patterns resulting from construction of new highway or rail infrastructure and ro-ro freight hubs.	Cumulative positive effects on transport related noise and vibration emissions in conjunction with: <ul style="list-style-type: none"> ▪ Noise Policy Statement for England²²⁷ ▪ Noise Action Plan: Roads²²⁸ ▪ Noise Action Plan: Rail²²⁹
Landscape	Cumulative negative/neutral effect – effects on these objectives are largely assessed as neutral in the absence of ISA mitigation, except for goals where new infrastructure construction is required (which comprise five of the fourteen goals identified under the four strategic priority pathway) where effects are assessed as negative/neutral or uncertain due to the potential for new visual impacts, changes to landscape character and the setting of built heritage assets, land take from existing built or natural assets such as residential or commercial premises or productive agricultural land and disturbance of archaeological assets.	Potential negative cumulative effects with other plans and strategies which promote significant new infrastructure construction likely to necessitate land take or introduce new visual elements to landscapes and townscapes. Note: cumulative impacts between specific plans or projects will be assessed in relation to the interventions proposed in the IDP (see section 8.3).
Heritage		
Soils/geology		
Material assets		

Cumulative effects mitigation recommendations

In order to mitigate for the identified potential negative intra-plan and inter-plan cumulative effects against the physical environment ISA objectives (biodiversity, water, natural capital, landscape, heritage, soils and geology and material assets) cumulative effects described in Table 7.10 it is proposed that Transport East would, in addition the mitigation already identified in Table 7.5 through to Table 7.10, undertake the following actions:

- Facilitate delivery of biodiversity and wider environmental net gain within the region by engaging with Defra, Natural England and the designated authorities to inform the approach to natural capital assessment and delivery of Biodiversity and Environmental Net Gain approach which is supportive of the Nature Recovery Network and local Nature Recovery Network Strategies and any local natural capital plans.
- Engage with the relevant Local Transport Authorities (LTAs) and Local Planning Authorities (LPAs) on an approach for considering landscape opportunities for the Transport Strategy linking with the biodiversity net gain delivery which can identify an integrated approach to the management of landscapes and townscapes and cultural heritage and linked to wider environment net gain providing for recreation and active travel.
- Liaise with Historic England to identify priority ‘at risk’ heritage assets within the Transport East region which have the potential to be affected by transport related development or are within

proximity to IDP interventions to identify opportunities to provide support for their conservation or improving access or safeguarding.

- Work with the Department for Transport to monitor the following metrics which would inform future iterations of the Transport Strategy and IDP and enable corrective action to be undertaken where needed to avoid facilitating induced demand on the highway network.
 - Number trips starting or ending at airports within the region which are undertaken by private vehicle
 - Freight flows along key congested routes within the study area

In addition, the Sustainability Action Plan provided in Table 9.1 includes measures which will:

- Support the 3-5 yearly monitoring of carbon emissions associated with implementation of the Transport Strategy to monitor progress towards achievement of the long-term target of achieving net zero carbon from transport by 2040.
- Identify best practice measures, based on latest research and where appropriate targeted consultation, to support local transport authorities in ensuring equality of access is achieved for all interventions proposed within the IDP.

8 Assessment of the Draft IDP Approach

The IDP sets out the proposed approach to an Investment and Delivery Programme to enable delivery of the Transport Strategy and will be regularly reviewed to ensure there is a pipeline of identified investment to delivering the pathways, goals and actions within the Strategy.

The IDP identifies proposed Regional schemes, strategic corridors and committed projects. These schemes are shown on Figure 8.1 along with relevant schemes outside of the Transport East Region.

8.1 Option level alternatives

A long list of interventions was identified through research and engagement with partners and includes strategic scale projects or packages of smaller interventions which collectively become strategic scale rather than local projects that would typically be funded by Local Transport Authorities. Interventions were classified into three pools:

- **'Idea's pool'** – projects that could deliver identified strategic priorities. These will include concepts, early feasibility studies and pre-Strategic Outline Business Cases. Although these will have considered options and alternatives, they will not have been subject to any in-depth assessment.
- **'Development pool'** – projects that are in development and have already been subject to a feasibility study or are currently developing or have completed a Strategic Outline Business Case that compares a short-list of alternative options for delivering the project.
- **'Delivery pool'** – projects where the development of a business case has achieved programme entry for delivery funding; acknowledging that planning consent may still be required. For these projects a proposed option has already been identified.

Based upon 56 interventions included within the long list for the IDP an initial risk-based assessment was undertaken using the methodology described in section 6.3 alongside the options appraisal process outlined in section 3.3 of the IDP.

A summary matrix of the ISA option level risk-based assessment is provided in Appendix E. Thirteen higher-risk options were identified through this process related to potential for impacts related to land take or operational impacts:

- A7 Develop an ambitious programme of traffic demand management measures across the region
- B1 A47 Tilney to East Winch dualling
- B2 Norwich Western link Road
- C3 Army and Navy Sustainable Transport Package
- C5 A12 northern section (A1152 to Lowestoft) upgrade
- D1 East-West rail package (enhanced Norwich and Ipswich connectivity and capacity to Cambridge as Eastern section of national East-West Rail project)
- D7 A11 Fiveways
- E5 A127 Outer Relief Road - Southend and Essex
- E6 A127 Northern Relief Road - Southend and Rochford
- E15 A13 / A126 East facing slips
- F1 A120 Braintree to Marks Tey Dualling
- F2 North Essex Rapid Transit – phase 2

Each of the above options scored a potential moderate or major adverse risk level against more than one ISA objective. Seven of these higher risk options have not been taken forward as priority interventions for delivery within the next five years. This provides an opportunity for further investigation of the impacts to inform the next revision of the Transport Strategy and IDP. Section 0 of this report summarises the assessment of 0-5 year priority interventions included within IDP and mitigation and enhancement measures identified, including dualling of the A120 between Braintree and Marks Tey.

8.2 Proposed options

The priority interventions identified within the IDP for delivery within the next 5 years are shown in Table 8.1.

Table 8.1: Interventions for delivery (Priority interventions in 0-5 years in bold)

Corridor A: Regional Strategic Packages	
<ul style="list-style-type: none"> ▪ A1: Re-open rail lines in rural/coastal areas ▪ A2: Widespread roll-out of EV charging infrastructure to increase EV take up (including HGVs) ▪ A3: Implement SMART ticketing across the region ▪ A4: Urban Active Travel Package ▪ A5: Inter-urban Active Travel Package ▪ A6: Rural Active Travel Package ▪ A7: Develop an ambitious programme of traffic demand management measures across the region ▪ A8: Ports Access Package ▪ A9: Coastal Access Package ▪ A10: Urban Sustainable Transport Package ▪ A11: Infill rail electrification associated with Felixstowe and Thameside ▪ A12: Widespread roll out of fibre broadband and 5G 	
Corridor B: Connecting our energised coastal communities	Corridor C: Connecting the heart of East Anglia
<ul style="list-style-type: none"> ▪ B1: A47 Tilney to East Winch dualling ▪ B2: Norwich Western Link Road ▪ B3: Acle Straight Dualling ▪ B4: A47/A17 Pullover Junction 	<ul style="list-style-type: none"> ▪ C1: GEML strategic rail package ▪ C2: A12 strategic package South: J19 - J25 (Chelmsford to Marks Tey) and M25 to the A14 ▪ C3: Army and Navy Sustainable Transport Package ▪ C4: A12 strategic package North ▪ C5: A12 Northern section upgrade ▪ C6: A140/A1120 MRN
Corridor D: Cross-Country Connectivity	Corridor E: South Essex Corridor
<ul style="list-style-type: none"> ▪ D1: East – West Rail package ▪ D2: Felixstowe Port to the Midlands and North rail ▪ D3: Haughley Rail Junction - double track (freight capacity) ▪ D4: Rail level crossing improvements not covered by Ely ▪ D5: Trowse Rail Bridge and Trowse lower junction double tracking ▪ D6: Felixstowe rail branch line - doubling ▪ D7: A11 Fiveways ▪ D8: A14 Package ▪ D9: Rail improvements across Suffolk 	<ul style="list-style-type: none"> ▪ E1: A1306 improvements and bus priority ▪ E2: M25 J30 capacity enhancement ▪ E3: Essex Thameside rail improvements ▪ E4: A127 Strategic Package ▪ E5: A127 Outer Relief Road Southend and Essex ▪ E6: A127 Northern Relief Road Southend and Rochford ▪ E7: Southend Congestion Relief Package ▪ E8: South Essex Bus Metro ▪ E9: Upgrade Wickford to Southminster rail line ▪ E10: GEML Rail Link to London Gateway ▪ E11: Southend Airport Sustainable Access Package ▪ E12: Harp House roundabout improvements ▪ E13: Improved access to Canvey ▪ E14: Southend Rapid Transit ▪ E15: A13 / A126 East facing slips
Corridor F: East-West Growth Corridor	Corridor G: UK Innovation Corridor
<ul style="list-style-type: none"> ▪ F1: A120 Braintree to Marks Tey Dualling ▪ F2: North Essex Rapid Transit – phase 2 ▪ F3: Braintree Branch line rail improvements ▪ F4: Clacton Town Centre Action Plan ▪ F5: A133 Frating to Clacton Enhancement 	<ul style="list-style-type: none"> ▪ G1: West Anglia main rail line package ▪ G2: A10 West Winch housing access road ▪ G3: Rapid Transit - Cambridge to Uttlesford ▪ G4: M11 J8 Long Term Scheme ▪ G5: Stansted Airport Sustainable Access Package

Table 8.2 through to Table 8.8 provide a summary of the assessment against the ISA objectives for the priority interventions associated with each transport corridor. Key effects (those assessed as either moderate or major adverse or beneficial) are outlined below.

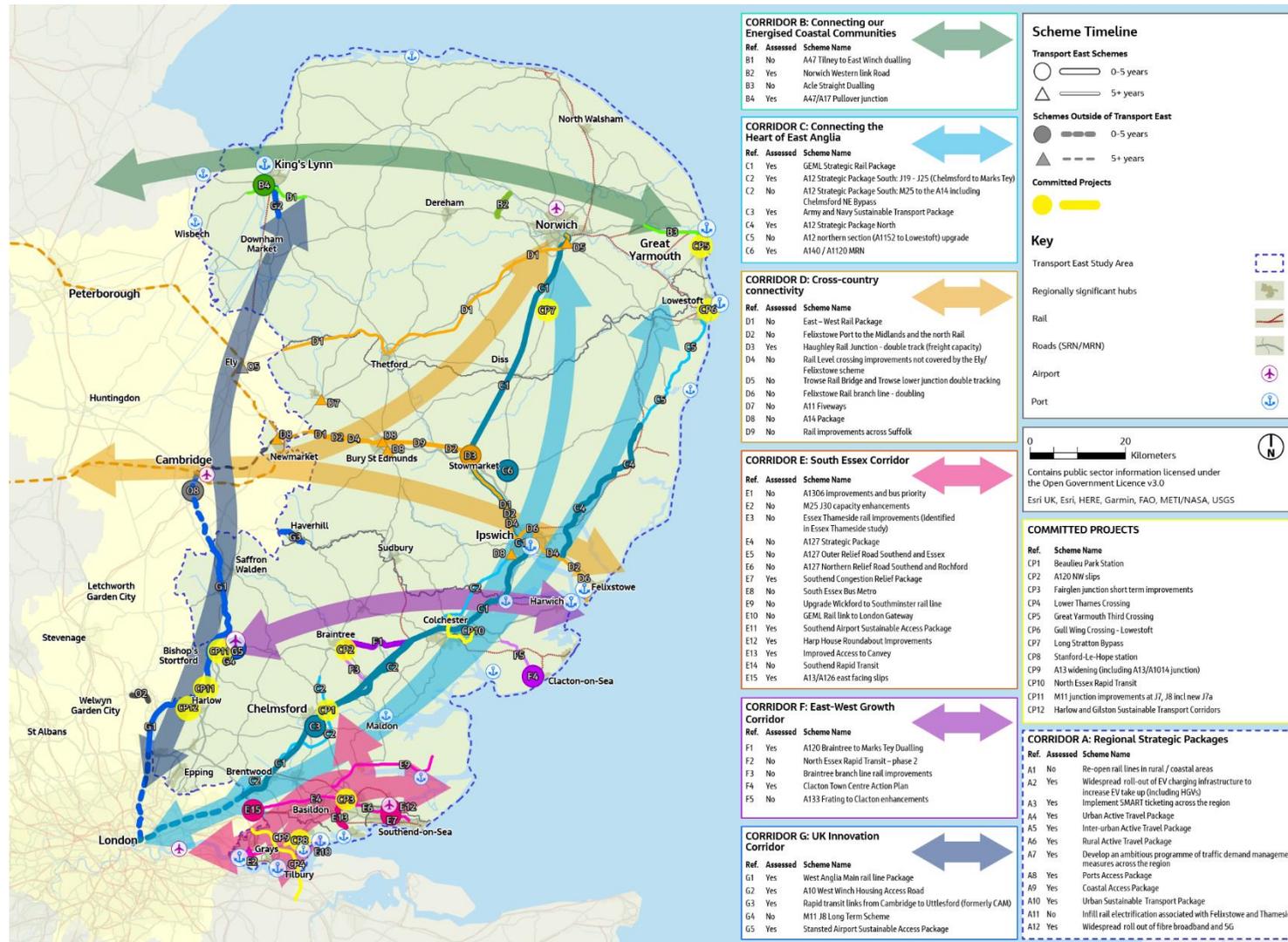


Figure 8.1: Transport East Draft Transport Strategy IDP schemes

Corridor A: Regional Strategic Packages (see Table 8.2)

- Residual moderate beneficial effects against the **population** objective (Rural Active Travel Package, Coastal Access Package, Widespread roll out of fibre broadband and 5G) and **equalities** objective (Rural Active Travel Package, Coastal Access Package) associated with improved walking and cycling access to economic opportunities, facilities and services for residents of rural and coastal areas.
- Residual moderate beneficial effects against the **health** objective (Urban Active Travel Package, Inter-urban Active Travel Package, Rural Active Travel Package, Ports Access Package, Coastal Access Package, Urban Sustainable Transport Package) associated with improved opportunities for active travel supporting increased physical activity levels and reductions in air and noise pollutant emissions as a result of modal shift.
- Residual moderate beneficial effects against the **climate** objective for all interventions due to support for modal shift away from private vehicles towards passenger transport and active travel modes or facilitating web-based alternatives to travel (except the Implement SMART ticketing across the region and Rural Active Travel Package interventions which are assessed as minor beneficial).
- Residual moderate beneficial effects against the **air** and **noise** objectives for the Urban Active Travel Package intervention associated with support for modal shift towards active travel modes and reduced transport related air and noise pollutant emissions.
- Residual moderate beneficial effects against the **material assets** objective for the Implement SMART ticketing across the region interventions and Ports Access Package as these options make significant use of existing rail and highway infrastructure.

Corridor B: Connecting our Energised Coastal Communities (see Table 8.3)

The Norwich Western Link is assessed as having residual moderate adverse effect on the **biodiversity** objective associated with the proposed viaduct over the River Wensum SAC. Further assessment (EIA and HRA) will be required down the line to identify suitable measures to mitigate for the likely loss of bat habitats and woodland. Loss of woodland associated with the viaduct construction would also have an adverse effect on the landscape objective (moderate adverse in the absence of mitigation, and minor adverse with mitigation including screening during construction and landscape planting in place).

Corridor C: Connecting the heart of East Anglia (see Table 8.4)

- Residual moderate beneficial effects against the **population** objective (A12 strategic package South: J19 - J25 (Chelmsford to Marks Tey) and Army and Navy Sustainable Transport Package) as a result of improved connectivity between Suffolk/Norfolk and London and reduced congestion on the local highway network improving access (journey times) respectively.
- Residual moderate beneficial effects against the **health** objective (GEML strategic package (Improvements in London, Essex, Suffolk and Norfolk), Army and Navy Sustainable Transport Package and A12 strategic package North (A14 to A1152)) due to modal shift towards passenger transport and reduced congestion on the highway network leading to reductions in air and noise pollutant emissions, and physical activity levels either indirectly through encouraging modal shift towards last-mile active travel or directly through new provision incorporated in highway schemes.
- A140/A1120 MRN would have residual moderate adverse effects against the **material assets** objective this intervention requires significant new infrastructure construction (new bypass).

Corridor D: Cross-county connectivity (see Table 8.5)

The Haughley Rail Junction - double track (freight capacity) intervention would have residual moderate beneficial effect against the **population** and **climate** objectives associated with improved connectivity and access to economic opportunities, facilities and services for settlements on the Felixstowe to Nuneaton corridor and reduced transport related air, noise and carbon emissions resulting from support for modal shift towards passenger transport modes and from road freight to rail freight.

Corridor E: South Essex Corridor (see Table 8.6)

- Residual moderate positive effects against the **health** objective (A1306 improvements and bus priority, Improved access to Canvey, Southend Congestion Relief Package and Southend Airport Access Package) associated with improved access to health facilities (specifically Southend Hospital) and reduced congestion on the highway network which would help reduce transport related air and noise pollutant emissions. There would also be opportunities to incorporate active travel provision within the A1306 improvements and bus priority and Improved access to Canvey interventions, with which would support increased physical activity levels.
- The A1306 improvements and bus priority intervention and Southend Airport Access Package would have residual moderate positive effects against the **climate** objective through support for modal shift towards low or zero carbon transport modes (passenger transport and active travel) and because the proposed improvements provide an opportunity to upgrade the existing infrastructure to be resilient against future worst case climate projections.
- The Harp House roundabout improvements would have residual moderate beneficial effects against the **material assets** objective as this intervention predominantly makes use of existing infrastructure.

Corridor F: East West Growth Corridor (see Table 8.7)

- Residual moderate positive effects against the **population** and **health** objectives for Clacton Town Centre Action Plan associated with improvements to the public realm, active travel opportunities and parking availability, which would support the tourism industry and improve access to services and facilities for local residents.
- Residual moderate negative effects against the **biodiversity, water, soils/geology** and **material assets** objectives for the Dualling the A120 between Braintree and Marks Tey intervention associated with potential for severance of ecological connectivity, capital carbon costs and loss of agricultural land and partial sterilisation of a minerals resource (Bradwell Quarry).

Corridor G: UK Innovation Corridor (see Table 8.8)

- The Rapid Transit - Cambridge to Uttlesford CAM intervention would have residual moderate beneficial effects against the **population, health, equalities, safety, climate, air** and **noise** objectives as it would support modal shift towards low or zero carbon and safe forms of passenger transport, reducing air and noise pollutant emissions and encouraging last mile active travel journeys which would increase physical activity levels. There would be the opportunity to ensure that the new provision is fully accessible and designed to maximise perceived safety.
- The West Anglia main line package would also have residual moderate beneficial effects against the **air** and **climate** objectives as a result of support for modal shift away from private vehicles.

Table 8.2: Corridor A: Regional Strategic Packages - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
A2 Widespread roll-out of EV charging infrastructure (including HGVs)	Pre	0	0	0/+	0	++	0/-	0	0/+	0/+	0	0	0	0/+	0
	Post	0	0	0/+	0	++	0	0	0/+	0/+	0	0	0	0/+	0
A3 Implement SMART ticketing across the region	Pre	0/+	0/+	0/-	0	0/+	0/+	0	0/+	0	0	0	0	++	0
	Post	0/+	0/+	0/-	0	0/+	0/+	0	0/+	0	0	0	0	++	0
A4 Urban Active Travel Package	Pre	+++	0/+	0/-	0/+	++	0/-	0	++	++	0	0	0	0/+	0
	Post	+++	0/+	0/+	0/+	++	0	0	++	++	0	0	0	0/+	0
A5 Inter-urban Active Travel Package	Pre	++	0/+	0/+	0/+	++	-/+	0	0/+	0/+	0	0	0	0/+	0/+
	Post	++	0/+	0/+	0/+	++	0/+	0	0/+	0/+	0/+	0	0	0/+	++
A6 Rural Active Travel Package	Pre	++	++	++	0/+	0/+	0/+	0	0/+	0/+	0	0	0	0/+	0/+
	Post	++	++	++	0/+	0/+	0/+	0	0/+	0/+	0	0	0	0/+	0/+
A7 Develop an ambitious programme of traffic demand management measures across the region.	Pre	0	0/-	0/-	0/+	0/+	0/+	0	0/+	0/+	0	0	0	0/+	0/+
	Post	0	0	0	0/+	++	0/+	0	++	0/+	0	0	0	0/+	0/+
A8 Ports Access Package	Pre	0/+	0/+	0/+	0/+	++	0	0	0/+	0/+	0	0	0/-	++	0
	Post	++	0/+	0/+	0/+	++	0	0	0/+	0/+	0	0	0	++	0

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
A9 Coastal Access Package	Pre	++	++	++	0/+	++	0	0/+	0/+	0/+	0	0	0	0/+	?
	Post	++	++	++	++	++	0	0/+	0/+	0/+	0	0	0	0	?
A10 Urban Sustainable Transport Package	Pre	++	0/+	0/+	0/+	++	0	0	0/+	0/+	0	0	0	0/+	?
	Post	++	0/+	0/+	0/+	++	0/+	0	0/+	0/+	0	0	0	0/+	?
A12 Widespread roll out of fibre broadband and 5G	Pre	0/+	++	0	0	0	0	0	0	0	0	0	0	0	0
	Post	0/+	++	0	0	0	0	0	0	0	0	0	0	0	0

Table 8.3: Corridor B: Connecting our energised coastal communities - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
B2 Norwich Western Link	Pre	++	-/+	0/+	0/+	-/+	---	0/-	-/+	0/+	-	0/-	0/-	0/+	-
	Post	++	0/+	0/+	0/+	0	--	0	-/+	0/+	0/-	0	0	0/+	0/-
	Pre	-/+	0/+	0	0/+	++	0/-	0/-	0/-	0/-	0/-	0/-	0	-/+	0/-

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
B4 A47/A17 Pullover Junction,	Post	0/+	0/+	0	0/+	++	0/-	0/-	0	0	0	0	0	-/+	0/+

Table 8.4: Corridor C: Connecting the heart of East Anglia - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
C1 GEML strategic package (Improvements in London, Essex, Suffolk and Norfolk)	Pre	++	-/+	0	0/+	++	0	0	0/+	0/+	0	0/-	0/-	0/+	-
	Post	++	-/+	0	0/+	++	0	0	0/+	0/+	0	0	0/-	0/+	0/-
C2 A12 strategic package South: J19 - J25 (Chelmsford to Marks Tey)	Pre	-/+	++	0/+	0/+	--	0/-	0/-	0/-	0	?	0	?	0/+	0/-
	Post	-/+	++	0/+	0/+	0/-	0/-	0	0/-	0	?	0	?	0/+	0
C3 Army and Navy Sustainable Transport Package	Pre	++	++	0	++	++	--	0/-	0	-/+	0/-	0	0	0/+	0/+
	Post	++	++	0	++	++	0/-	0/-	0	-/+	0/-	0	0	0/+	0/+
C4 A12 strategic package North (A14 to A1152)	Pre	++	0/+	0/+	0/+	-/+	0/-	0/-	0/+	0/+	0/-	0	0/-	0/+	0
	Post	++	0/+	0/+	0/+	0/+	0/-	0/-	0/+	0/+	0	0	0	0/+	0

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
C6 A140/A1120 MRN	Pre	0/+	-/+	0	0/+	-/+	-/+	0/-	-/+	-/+	0/-	0/-	0/-	-	0/-
	Post	0/+	0	0	0/+	0/+	0/+	0	-/+	-/+	0	0	0	-	0/-

Table 8.5: Corridor D: Cross-county connectivity - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
D3 Haughley Rail Junction - double track (freight capacity)	Pre	0/+	++	0/+	0/+	0/+	0/-	0/-	0/+	0/-	0/-	0/-	0/-	0/+	?
	Post	0/+	++	0/+	0/+	++	0/-	0/-	0/+	0/-	0	0	0/-	0/+	?

Table 8.6: Corridor E: South Essex Corridor - summary of assessment of priority IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
E1 A1306 improvements and bus priority	Pre	++	0/+	0/+	0/+	++	0/-	0/-	++	0/+	0	0	0	0/+	0
	Post	++	0/+	0/+	0/+	++	0	0	++	0/+	0	0	0	0/+	0
E12 Harp House roundabout improvements	Pre	0/+	0/+	0/+	0/+	0/+	0	?	-/+	0/-	0/-	0	0	++	0
	Post	0/+	0/+	0/+	0/+	0/+	0	?	-/+	0/-	0	0	0	++	0
E13 Improved access to Canvey	Pre	0/+	++	++	0/+	-/+	0/-	?	-/+	0/-	0	0/-	0/-	0/+	0/+
	Post	++	++	++	0/+	0/+	0	?	-/+	0/-	0	0	0	0/+	0/+
E11 Southend Congestion Relief Package	Pre	++	++	0	0/+	-/+	0	0	0/+	0/+	0	0	0	0/+	0
	Post	++	++	0	0/+	0/+	0	0	0/+	0/+	0	0	0	0/+	0
E14 Southend Airport Access Package	Pre	++	0/+	0/+	0/+	++	0	?	0/+	0/+	0	0	0	0/+	0/+
	Post	++	0/+	0/+	0/+	++	0	?	0/+	0/+	0	0	?	0/+	++
E15 A13/A126 East Facing Slips	Pre	0/+	++	0	0/+	-/+	0/-	0/-	-/+	-/+	0/-	0/-	0	-/+	0/-
	Post	0/+	++	0	0/+	0/+	0/-	0/-	-/+	-/+	0/-	0/-	0	-/+	0/-

Table 8.7: Corridor F: East-West Growth Corridor - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
F1 Dualling the A120 between Braintree and Marks Tey	Pre	-/+	-/+	0/+	0/+	-/+	--	--	-/+	0/+	0/-	0/-	--	--	0/-
	Post	0/+	-/+	0/+	0/+	-/+	--	--	-/+	0/+	0/-	0/-	--	--	0/-
F4 Clacton Town Centre Action Plan	Pre	++	++	0/+	0/+	-/+	0	0	0	0	0/+	0/+	0	0	0
	Post	++	++	0/+	0/+	0/+	0	0	0	0	0/+	0/+	0	0	0

Table 8.8: Corridor G: UK Innovation Corridor - summary of assessment of IDP interventions

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
G1 West Anglia mainline rail package	Pre	0/+	0/+	0/+	0/+	++	0	0	++	0/+	0	0	0	0/+	0
	Post	0/+	0/+	0/+	0/+	++	0	0	++	0/+	0	0	0	0/+	0
G2 A10 West Winch housing access road	Pre	0	0/+	0/+	0/-	--	--	0/-	0/-	0/-	0	0/-	0/-	-/+	0/+
	Post	0/+	0/+	0/+	0	0/-	0/-	0	0/-	0/-	0	0	0	-/+	0/+

Option	ISA objective														
	Mitigation or Enhancement	Health	Population	Equality	Safety	Climate	Biodiversity	Water	Air	Noise	Landscape	Heritage	Soils/Geology	Material Assets	Natural Capital
G3 Rapid Transit - Cambridge to Uttlesford	Pre	++	-/+	++	++	++	0/-	0	0/+	0/+	0	0	0	0/+	0
	Post	++	++	++	++	++	0/-	0	++	++	0	0	0	0/+	0
G5 Stansted Airport Sustainable Access Package	Pre	0/+	0/+	0	0/+	0/+	0	0	0/+	0/+	0	0	0	0/+	0
	Post	0/+	0/+	0	0/+	0/+	0	0	0/+	0/+	0	0	0	0/+	0

Mitigation recommendations

Table 8.9 identifies ISA mitigation measures identified against each of the ISA objectives for the priority interventions identified within the IDP for delivery over the next five years where these have not already been identified as being general Transport Strategy ISA mitigation measure within Table 7.4.

Table 8.9: IDP mitigation recommendations

ISA objective	ISA mitigation recommendations
Population	<ul style="list-style-type: none"> Public consultation should be undertaken where the construction of new highway schemes has potential to disrupt current access, in order to inform measures to minimise disruption in access for users. Dualling the A120 between Braintree and Marks Tey – scheme design should avoid new severance of PRow and include new active travel provision linking smaller settlements of Crossing and Silver Cross with Braintree and Chelmsford
Equalities	<ul style="list-style-type: none"> Urban Active Travel Package should include safe routes for schools Ports Access Package should consider how intervention can benefit coastal areas more widely, as well as the primary target of ports
Health	<ul style="list-style-type: none"> All interventions involving new or reconfigured highway infrastructure, and also the Ports Access Package, should aim to include segregated provision for active travel as well as motorised vehicle travel.
Safety	<ul style="list-style-type: none"> Urban Active Travel Package Traffic free routes, safe routes to school and cycle routes should consider safety in design Shared use footway/cycleways should be segregated (all relevant interventions) New or upgraded public transport interchanges and other infrastructure should include measures to improve passenger safety and perceptions of safety through good lighting, staffing levels and provision of designated waiting areas.
Biodiversity	<ul style="list-style-type: none"> Seek to incorporate wildlife connectivity improvements alongside creation of new footways/cycleways (all relevant interventions) Army and Navy Sustainable Transport Package – biodiversity net gain to be delivered through scheme design using on site and off site compensation as necessary. Mitigation as identified through HRA process for potential adverse impacts River Wensum SAC as a result of the Norwich Western Link intervention. A1306 improvements and bus priority – scheme design to avoid land take from adjacent priority habitats and Ancient Woodland A10 West Winch housing access road – construction should be completed outside the lapwing breeding season Apply maintenance regimes such as late verge cutting to enhance biodiversity
Water	<ul style="list-style-type: none"> Use of standard good practice mitigation to minimise risk of surface and groundwater pollution Use of SUDS and other approaches such as permeable materials, swales and link to biodiversity and landscape mitigation Design of new infrastructure to minimise land take from flood plan as far as practicable - flood risk assessment will be required.
Air	<ul style="list-style-type: none"> Rail, rapid transit and other forms of passenger transport interventions (including ferry transport) should be fuelled by low or zero emission energy sources
Noise/vibration	<ul style="list-style-type: none"> Undertaken assessment of noise impact of ferry transport proposed under the Coastal Access Package
Climate	<ul style="list-style-type: none"> Use of renewable energy sources to power construction activities Use of low carbon materials in design of new infrastructure New infrastructure design to be resilient to current worst case climate projections for design life of infrastructure

ISA objective	ISA mitigation recommendations
	<ul style="list-style-type: none"> Rail, rapid transit and other forms of passenger transport interventions (including ferry transport) should be fuelled by sustainable energy sources.
Landscape	<ul style="list-style-type: none"> Use of appropriate screening to avoid or reduce visual impacts during construction and operation Identify potential for advance planting for mitigating impacts and link to biodiversity enhancement where possible Norwich Western Link Road intervention - the viaduct design should include tree planting and elements similar to previous setting (material choice etc) Army and Navy Sustainable Transport Package – replanting required along Essex Yeomanry Way
Heritage	<ul style="list-style-type: none"> Clacton Town Centre Action Plan – consider how delivery of intervention can help improve setting of built heritage assets within the town centre Identify area specific risks in discussion the county archaeologist and Heritage England
Soil/geology	No additional measures identified over and above those detailed in Table 7.4
Material assets	<ul style="list-style-type: none"> Urban Active Travel Package should reuse existing transport infrastructure as far as possible Consideration of Waste Hierarchy in design of all interventions
Natural capital	No additional measures identified over and above those detailed in Table 7.4

8.3 Cumulative effects

Intra-plan cumulative effects

Table 8.10 sets out the intra-plan cumulative effects identified for the schemes included within the IDP against each ISA objective. Only priority interventions (those schemes proposed within the next 5 years) have been included in the cumulative assessment. In summary, key likely residual intra-plan cumulative effects are:

- Positive cumulative effects against the **population** and **health** objectives resulting from improved access to economic opportunities and health facilities, as well as positive effects on safety and air quality.
- Neutral/negative cumulative effects on the **water** objective due to potential negative effects on a WFD waterbody from and IDP intervention and another planned development which may have overlapping construction periods and are located close proximity.
- Mixed positive/negative effects on the **air**, **noise** and **climate** objectives

Table 8.10: IDP intra-plan cumulative effects

ISA objective	Intra-plan cumulative effects
Population	<p>The overall effect on the population of the TE region is likely to be significantly positive. This is due to improvements to access jobs, schools and other facilities. This is particularly evident in Southend, Canvey and Clacton, which all benefit from multiple interventions over the next 5 years including:</p> <ul style="list-style-type: none"> Southend Airport Access Package Harp House Roundabout Improvement Clacton Town Centre Action Plan Improved Access to Canvey Urban Active Travel Package Inter-Urban Active Travel Package <p>Potential for localised disturbance and disruption of access on the road network, due to overlapping construction periods for Harp House Roundabout and Southend Airport Access Package, depending on scheme designs.</p>

ISA objective	Intra-plan cumulative effects
	<p>There is also potential for benefits to population due to supporting access for tourism and recreation, with two large international airports within the IDP improving airport access:</p> <ol style="list-style-type: none"> 1. Southend Airport Access Package 2. Stansted Airport Sustainable Access Package
Equalities	<p>Some interventions in the IDP are likely to significantly improve access to both rural and coastal areas. Access to rural and coastal areas is likely be improved by improving road networks over the next 5 years, including:</p> <ul style="list-style-type: none"> ▪ Improved access to Canvey ▪ A12 strategic package North (A14 to A1152) <p>Access to rural and coastal areas may also be improved through improved public transport services and active travel provisions, such as the following interventions:</p> <ul style="list-style-type: none"> ▪ Rapid Transit - Cambridge to Uttlesford CAM ▪ A1306 improvements and bus priority ▪ Haughley Rail Junction – double track (freight capacity) <p>In addition, the Coastal Access Package, Ports Access Package and Rural Active Travel package are all regional interventions likely to result in overall access improvements for rural and coastal areas.</p>
Health	<p>Likely to be overall net benefit to public health within the region due to improvements in air quality as a result of multiple interventions that promote modal shift towards lower emission forms of transport such as public passenger transport and active travel. In addition to supporting a modal shift, multiple interventions are likely to reduce congestion on the region’s road network, likely to benefit the region’s air quality.</p> <p>Also potential for indirect benefits on access to Southend Hospital due to both Harp House Roundabout Improvements and Southend Airport Access package, as both aim to reduce congestion and improve access to facilities in close proximity to the hospital. This will be further strengthened by Southend Congestion Relief package which is included in the IDP at a later date.</p>
Safety	<p>Overall road user safety is likely to improve throughout the region, as the following interventions aim to introduce bypasses, reduce congestion or improve junctions:</p> <ul style="list-style-type: none"> ▪ A47/A17 Pullover Junction, Kings Lynn ▪ Norwich Western Link ▪ Army and Navy Sustainable Transport Package ▪ A140/A1120 MRN ▪ Harp House roundabout improvements ▪ Improved access to Canvey ▪ A10 West Winch housing access road <p>Road user safety but may be particularly improved for those in Chelmsford, with a number of interventions located within Corridor C aiming to reduce congestion. Chelmsford may further benefit from the urban active travel package, and the inter-urban active travel package, improving active travel safety measures.</p> <p>Road user safety may also be improved indirectly due to interventions encouraging a modal shift from private vehicle use to public transport, resulting in fewer vehicles and potentially fewer road incidents/accidents.</p> <p>Safety of public transport users is also likely to improve regionally as a result of interventions which increase capacity, increase journey frequency and the introduction of transport hubs. High journey frequency for public transport will increase feelings of safety and security by reducing duration of waiting times in public spaces. Increasing capacity may reduce crowding on public transport, and transport hubs have potential to consider safety design elements such as lighting and staffing.</p>

ISA objective	Intra-plan cumulative effects
Water	<p>The River Roach is in close proximity to both Harp House Roundabout Improvements and Southend Airport Access package. Both schemes included are included in the IDP 0-5 year timescale, and therefore there is potential for negative cumulative effects on the local water course (approximately 400m from Prittle Brook, which feeds into the River Roach) as a result of overlapping construction period.</p>
<p>Natural capital</p> <p>Biodiversity</p>	<p>Potential for cumulative negative effects arising from two schemes south of Kings Lynn which require significant new infrastructure construction and likely a degree of land take from greenfield land. The schemes are:</p> <ol style="list-style-type: none"> 1. A10 West Winch Housing Access Road 2. A47/A17 Pullover Junction <p>Cumulatively, these schemes may result in a loss of habitats and disturbance to wildlife (including protected species).</p>
Air quality	<p>Regional scale schemes prioritising active travel and sustainable travel likely to result in region wide benefits to air quality. A specific site which may directly benefit as a result of a combination of two schemes included in the IDP is an AQMA site located less than 1km South from Southend Airport Access Package and Harp House Roundabout Improvement. As the schemes aim to reduce congestion and improve sustainable access there may be a direct benefit on the AQMA site (Ref: 1625).</p> <p>Overall, the cumulative effects on nitrogen deposition are likely to be mixed positive/negative. Highway schemes are likely to alter road traffic patterns locally, potentially worsening effects in some locations. However, at a regional level effects are likely to be beneficial with overall net benefits to air quality as many of the IDP interventions support modal shift from conventionally fuelled private vehicles towards active travel, public transport and EVs.</p>
Climate	<p>Overall, there are likely for mixed positive/negative cumulative effects on climate ISA objectives. Regional scale schemes prioritising active travel and sustainable travel (including use of EVs and passenger transport) would help reduce transport related carbon emissions across the region. However, there a number of new highway schemes are likely to have significant carbon costs associated with construction including:</p> <ul style="list-style-type: none"> ▪ A10 West Winch Housing Access Road ▪ A47/A17 Pullover Junction ▪ Dualling the A120 between Braintree and Marks Tey <p>In addition to the carbon associated with construction, these new schemes may result in induced demand, although modal shift towards EVs would help reduce the resultant rise in carbon emissions.</p>
Noise/vibration	<p>There would be mixed positive/negative cumulative effects on the noise and vibration ISA objective. Cumulative negative effects on noise and vibration would result from localised disturbance due to overlapping construction periods for example, Harp House Roundabout Improvements and Southend Airport Access Package. Following construction, reduced congestion and improved access may result in long term positive cumulative effects, however this may be partly offset due to induced demand.</p> <p>It is likely that due to numerous interventions supporting a modal shift form private vehicle use to public transport and active travel, there may be a decrease in noise and vibration impacts. This may be particularly noticeable in Southend and Clacton due to a combination of the following interventions:</p> <ol style="list-style-type: none"> 1. Southend Congestion relief package, Urban Active travel package 2. Clacton Town Center Action Plan, Urban Active travel package

ISA objective	Intra-plan cumulative effects
Heritage	No cumulative effects on specific heritage receptors have been identified, although it is acknowledged that many interventions require new infrastructure construction, and therefore risk disturbance to or truncation of archaeological remains.
Soils/geology	As mentioned above in cumulative effects affecting air quality, there is potential for mixed positive/negative cumulative effects on nitrogen emissions. Deposition of nitrogen oxides can potentially alter soil chemistry and fertility, and therefore interventions which may induce demand and increase deposition may potentially experience negative impacts. While there is potential for localised negative effects, regionally there may be overall net benefits due to improvements to air quality (see above).
Material assets	<p>A number of interventions within the IDP aim to improve or re-use existing infrastructure, resulting on cumulative positive effects on the material assets ISA objectives. The interventions include Army and Navy Sustainable Transport Package, Haughley Rail Junction - double track (freight capacity) and Dualling the A120 between Braintree and Marks Tey.</p> <p>Other interventions may cumulatively result in beneficial impacts on another material assets ISA objective, relating to supporting existing and planned land use. The A10 West Winch housing access road intervention is particularly notable as it is the supporting infrastructure required for a large, planned housing development.</p> <p>The following three interventions are likely to require land take from agricultural land, with cumulative negative impacts on the material assets ISA objectives. The first two interventions below are located within close proximity to one another and so have greatest potential for impacts on local agricultural holdings.</p> <ul style="list-style-type: none"> ▪ A10 West Winch Housing Access Road ▪ A47/A17 Pullover Junction ▪ Norwich Western Link Road
Landscape	No cumulative effects on specific landscape receptors have been identified.

Inter-plan cumulative effects

Inter-plan cumulative impacts have been assessed using interventions in the IDP and other plans and schemes. Table 8.11 shows planned development within the study area, those that are greyed out were not considered to result in cumulative effects related to interactions between schemes².

Table 8.11: List of other plans and schemes within the Inter-plan cumulative assessment

Scheme	Nationally Significant Infrastructure Projects (NSIPs)	IDP Committed Projects	Scoped in/out Comment
The Sizewell C project	X		Interaction identified
North Falls Offshore Windfarm	X		No interaction
Five Estuaries Offshore Windfarm	X		No interaction

² All plans or schemes involving new infrastructure construction, or which may lead to altered traffic patterns, have potential to result in loss of habitat, land use, soils and impacts on landscape and cultural heritage and would also generate carbon emissions. This assessment recognises the need to minimise such effects and identifies mitigation for IDP priority interventions, but for reasons of proportionality the scope of the cumulative effects assessment has been limited to other schemes which are located within close proximity to IDP to priority interventions where there is potential for combined interactions on receptors and there would be opportunities to influence environmental outcomes or take account of combined impacts by working with scheme promoters at prior to and during project delivery stage.

Scheme	Nationally Significant Infrastructure Projects (NSIPs)	IDP Committed Projects	Scoped in/out Comment
Oikod Marine and South Side Development	X		Application pending
East Anglia TWO offshore windfarm	X		No interaction
East Anglia ONE North Offshore Windfarm	X		No interaction
A47 – A11 Thickthorn Junction	X		No interaction
A47 North Tuddenham to Easton	X		Interaction identified.
A47 Blofield to North Burlingham	X		No interaction
Bradwell B new nuclear power station	X		Application pending
Sheringham and Dudgeon Extension Projects	X		No interaction
Norfolk Vanguard	X		No interaction
Sunnica Energy Farm	X		Interaction identified
Bramford to Twinstead	X		No interaction
Nautilus Interconnector	X		Application pending
Progress Power Station	X		Scoped out – application from 2015
Great Yarmouth Third River Crossing	X	X	Interaction identified.
Norfolk Boreas	X		No interaction
Longfield Solar Farm	X		Application pending
East Anglia THREE Offshore Wind Farm	X		No interaction
Lake Lothing Third Crossing	X	X	Interaction identified.
East Anglia ONE offshore windfarm	X		No interaction
TIGRE Project 1 (TP1)	X		No interaction
Palm Paper 3 CCGT power station kings lynn	X		Scoped out – application from 2016
Kings Lynn Connection B project	X		Scoped out – application from 2013

Scheme	Nationally Significant Infrastructure Projects (NSIPs)	IDP Committed Projects	Scoped in/out Comment
Thurrock Flexible Generation Plan	X		No interaction identified.
Rampion 2 Offshore Windfarm	X		No interaction
M25 junction 28 improvements	X		Interaction identified
Navitus Bay Wind Park	X		No interaction
Lower Thames Crossing	X	X	Interaction identified.
Rampion Offshore Wind Farm	X		No interaction
Thanet Extension Offshore Wind Farm	X		No interaction
Beaulieu Park Station		X	Interaction identified.
A120 NW slips		X	No interaction
Fairglen Junction Short Term improvements		X	Interaction identified.
Stanford-Le-Hope station		X	Interaction identified.
A13 widening (including 13/A1014 junction)		X	Interaction identified.
North Essex Rapid Transit		X	Interaction identified.
M11 junction improvements at J7, J8 including new J7a		X	No interaction
Harlow and Gilston Sustainable Transport Corridors		X	Interaction identified.

Table 8.12 sets out the inter-plan cumulative effects identified for the IDP against each ISA objective. In summary, the key residual inter-plan impacts are likely to be beneficial in nature. Most interventions included in the IDP within the next 5 years along with other local plans and planned development are likely to result in beneficial cumulative effects against the ISA objectives.

Table 8.12: IDP inter-plan cumulative effects

ISA objective	Inter-plan cumulative effects
Population	<p>A number of committed projects have potential to result in cumulative effects with schemes included in the IDP.</p> <p>The following IDP committed projects have potential to result in cumulative positive effects on access to ports when in combination with the Ports Access Package (depending on location of package):</p> <ul style="list-style-type: none"> ▪ Lower Thames Crossing ▪ Gullwing Crossing ▪ Great Yarmouth Third Crossing ▪ A13 Widening

ISA objective	Inter-plan cumulative effects
	<p>This improvement on access to ports will positive effects ISA objectives relating to supporting access to employment and facilities and may improve journey times and quality of travel through providing new routes and easing congestion.</p> <p>The IDP committed scheme 'North Essex Rapid Transit' may also result in beneficial cumulative effects on access to facilities and services when combined with the effects of the following IDP schemes:</p> <ul style="list-style-type: none"> ▪ Ports Access Package (includes North Tendring Access Package) ▪ A133 Frating to Clacton Enhancement (may utilise enhanced infrastructure) <p>In particular, this is likely to benefit those in rural North Essex, and settlements surrounding Colchester.</p> <p>Sizewell C is a current NSIP project, proposing a new nuclear power station on the Suffolk Coast. Scheme C4 in the IDP (A12 Strategic Package North) aims to provide mitigation for the significant energy project potentially through access measures. There is therefore potential to support local economic development and access to the site.</p>
Equalities	<p>There is potential for positive cumulative effects on the equalities objective due to improvements to access for coastal and rural populations. There are a number of schemes likely to benefit rural and coastal populations access (see section 0), however the following committed schemes are likely to act cumulatively and further improve this access:</p> <ul style="list-style-type: none"> ▪ North Essex Rapid Transit – connecting rural areas surrounding Colchester, Chelmsford and Braintree to urban areas and key transport links <p>In addition to positive cumulative effects on rural and coastal populations, there is also potential for positive cumulative effects on affordability of transport. Within the IDP baseline, there are three interventions which provide/support public transport in Essex: Stanford-Le-Hope Station, Beaulieu Park Station and North Essex Rapid Transit. It is likely that these modes of transport will be affordable and with certain design elements, have the potential to be accessible to young, old and mobility impaired.</p>
Health	<p>The following IDP committed schemes incorporate active travel provisions, and when combined with the Urban Active Travel Package, may result in positive cumulative effects:</p> <ul style="list-style-type: none"> ▪ Fairglen Junction Improvements ▪ Harlow and Gilston Sustainable Transport Corridors <p>A recent application (Cambridge South infrastructure enhancement: Transport and Works Order) for a new railway station is listed on the Department for Transport's Transport and Works Order and is also included as an outside the region scheme. The proposed new station aims to provide a service to a large biomedical facility in South Cambridge, listed as a priority growth area in the Cambridge Local Plan 2018. There is potential for interaction with the Rapid Transit scheme in the IDP, resulting in further improvements to access to Cambridge, as well as the large health facility.</p> <p>The new station application also includes significant opportunities to facilitate active travel to and from the station, with over 1000 cycle spaces proposed, and designated walkways. When combined with the active travel packages included in the IDP, there is opportunity for significant beneficial impacts to health through active travel measures.</p>
Safety	<p>All local transport plans refer to prioritising improving safety and reducing the number of KSI. Road safety across the region is likely to benefit cumulatively from both local transport plans, and a number of schemes listed in the IDP which aim to reduce congestion and improve road user safety and experience.</p>
Water	<p>There is potential for negative cumulative effects on the water ISA objective, resulting from the combination of the Norwich Western Link Road intervention and the A47 North Tuddenham to Easton scheme which could both potentially have adverse effects on the River Tud depending on the final design and construction methodologies employed.</p>
Natural capital	<p>There is potential for negative cumulative effects on natural capital, biodiversity and landscape, resulting from the combination of the A47 North Tuddenham to Easton and the Norwich Western Link Road.</p>
Biodiversity	

ISA objective	Inter-plan cumulative effects
Landscape	<p>The two schemes are located in close proximity and intersect in places. As the schemes include dualling of an existing road and construction of a new road there is potential for land take, with cumulative negative effects on natural capital, habitats and wildlife (including protected species) and the existing rural landscape. No cumulative effects on the River Wensum SAC are anticipated based on the publicly available information for the A47 Tuddenham to Easton scheme.</p> <p>All schemes involving land take and habitat loss or affecting habitat condition can have a combined effects on habitat types and species that are supported and represent a loss of natural capital. Biodiversity net gain will not address irreplaceable habitat losses but will be required for other habitats. This is likely to include the need for offset provision for many of the schemes.</p>
Climate	<p>Each local transport plan within the study area prioritises decarbonisation and sustainable transport, and therefore when combined with a number of schemes included in the IDP, there is likely to be an overall net benefit to local emissions in the long term. However, considering the committed schemes and the priority schemes involving construction and the transition time to alternative fuels, the cumulative effect is likely to be adverse in the shorter term and beneficial over the lifetime of the Transport Strategy and IDP.</p>
Air	<p>There is potential for cumulative effects resulting from the Norwich Western Link Road intervention included in the IDP and the A47 North Tuddenham to Easton scheme which are located in very close proximity. There is therefore potential for overlapping construction periods resulting in short term negative effects on both air quality and noise and vibration. Long term, the collective result will be overall decrease in noise and vibration, and improved air quality due to decreased congestion and transition to alternative fuels.</p> <p>Sunnica Energy Farm West site is proposed in close proximity to Junction 37 on the A14. Scheme D8 in the IDP (A14 Package) includes this junction and therefore there is potential for interaction. There is potential for overlapping construction periods, resulting in congestion on nearby roads as a result of both increased traffic, and potential road closures while construction is underway on A14. This will likely result in short term adverse effects on noise and vibration.</p> <p>There is potential for interaction between the Nationally Significant Infrastructure Project (NSIP) M25 Junction 28, and scheme C2 in the IDP (A12 Strategic Package South (M25 – A14) *expanded*). Junction 28 on the M25 connects the M25 to the A12 near Brentwood. Both schemes will likely address congestion and improvements to highways, which will likely reduce long term adverse effects on noise and air quality as a result of congestion. However short term, there is potential for increased adverse effects as a result of overlapping construction periods.</p>
Noise/vibration	
Heritage	<p>No cumulative effects on specific heritage receptors have been identified at this stage, although it is acknowledged that many interventions require new infrastructure construction, and therefore risk disturbance to or truncation of archaeological remains.</p>
Soils/geology	<p>Regional level impacts through combined effects on nitrogen deposition from IDP interventions involving new or amended highway infrastructure in conjunction with other highway schemes within the region. However, there is also potential for combined positive effects through IDP priority interventions and committed schemes that support both alternative fuel transition and modal shift schemes.</p>
Material assets	<p>Could be a cumulative adverse effect on agricultural land arising from the three IDP interventions identified in Table 8.10 and the A47 Tuddenham to Easton. As described against the noise/vibration objective, the Norwich Western Link Road IDP intervention and A47 Tuddenham to Easton scheme are located in close proximity and therefore have potential for combined impacts on the economic viability of local agricultural holdings</p> <p>As identified in Noise and Vibration, there is potential for interaction between scheme D8 and the Sunnica Energy Farm project identified in Table 8.11. As a result the improvements proposed in scheme D8 may provide supporting infrastructure for a nationally significant infrastructure project (NSIP) and beneficial effects on planned land use.</p> <p>As identified in Noise and Vibration, there is potential for interaction between scheme C2 and the M25 Junction 28 project identified in Table 8.11. As a result of the improvements proposed in scheme C2, it is likely it will support/compliment the NSIP project, providing beneficial effects on planned land use.</p>

Cumulative effects mitigation recommendations

Strategy level mitigation for potential cumulative adverse effects on the climate and landscape, biodiversity, natural capital and heritage objectives as set out in Table 8.10 and Table 8.12 would provide mitigation for the priority IDP interventions. In addition, the following IDP specific measures have been identified:

- Work with Local Authorities and Local Transport Authorities to undertake a high-level assessment of capital carbon emissions associated with (i) priority IDP interventions planned for delivery within the next five years and (ii) other interventions planned for delivery within the 5-10 year period (see measure SSA-C-1 of Sustainability Action Plan provided in Table 9.1). This information could then be used in conjunction with the future Natural Capital assessment, and Biodiversity and Environmental Net Gain reporting for the Transport Strategy and coordinated approach on landscape proposed in section 7.3 to identify opportunities for contributing to carbon sequestration through habitat creation and/or land use management.
- Engage with the scheme proponents for the Harp House Roundabout and Southend Airport Access Package priority IDP interventions to ensure appropriate mitigation for potential adverse cumulative effects on the River Roach is implemented at project delivery stage.
- Engage with the scheme proponents for Norwich Western Link Road IDP intervention and for the A47 North Tuddenham to Easton scheme to ensure that the landscape and ecological mitigation proposals for both schemes maximise opportunities to deliver environmental net gain, and at project delivery stage to identify appropriate mitigation to ensure that there are no cumulative adverse effects on the River Tud or on local communities associated with disruption to access along the highway network or construction related noise and dust emissions.

9 Monitoring Plans

The SEA Regulations require the monitoring of a plan or strategy, so that significant effects can be identified and any action required is undertaken. Monitoring Plans provide a means to demonstrate the sustainability of the adopted strategy using sustainability objectives, targets and indicators. They also permit the early identification of emerging significant effects to enable corrective actions to be taken during strategy implementation.

Table 9.1 sets out a Sustainability Action Plan for the Transport Strategy which includes strategic level actions which will support delivery of the Monitoring Plan. This includes actions to work with partners across areas such as reporting on natural capital/ecosystem services, biodiversity net gain provision and carbon emissions accounting and including developing templates or proformas for collecting data and information on scheme proposals on a consistent basis so this can support regional analysis and reporting in the future.

Table 9.2 presents the draft ISA Monitoring Plan for the draft Transport East Transport Strategy and IDP. This covers the specific ISA objectives and proposals for measuring performance against these. Where monitoring identifies that targets included in the ISA monitoring plan or Transport Strategy and IDP monitoring and evaluation plan have not or will not be achieved, future Transport Strategy goals and IDP interventions will need to incorporate appropriate revisions.

Table 9.1: Sustainability Action Plan

ISA objective	ID	Action	Target	Responsible party
General (applicable to all or multiple ISA objectives)	SSA-GEN-1	Integrate ISA Sustainability Action Plan and ISA Monitoring Plan with Transport Strategy and IDP Monitoring and Evaluation Plan	Facilitate coherent single set of monitoring targets and indicators, and single reporting schedule	TE
	SSA-GEN-2	Engage with partners to develop templates/proformas for monitoring reporting, including schedule of data inputs and associated timescales where data to be provided by third parties and including a template for individual scheme reporting to collect and update information as scheme proposals are developed. (see Table 9.2). Templates to be digital/online to facilitate updating and access and data analysis/mapping. – this could also facilitate future digital and interactive reporting.	Facilitate ISA monitoring and reporting and input to future IDP and Strategy updates	TE
	SSA-GEN-3	Reporting on funding % across the strategic priorities and strategic partners	Balance of funding reflecting Strategy priorities and achieving sustainability objectives	TE
	SSA-GEN-5	Given limited information available in public domain regarding sustainability of shipping fuels and opportunities to minimise air and water pollution and disturbance to aquatic wildlife - engage with government and partners to identify approaches.	Identify appropriate targets	TE in partnership with relevant organisations

ISA objective	ID	Action	Target	Responsible party
Population and Equalities	SSA-EQ-1	Work with partners to bring together existing knowledge on accessibility needs across groups and identify where additional consultation is required and ensure that schemes are identified and designed with requirements taken into account	Support inclusive modal shift, access to alternative fuel transport and active travel participation	TE
	SSA-EQ-2	Develop methodology for tracking strategy monitoring objectives (also included in ISA monitoring plan) regarding elimination of transport deserts and % of people with access to services	Support reporting on access and provide evidence baseline for future iterations of the Strategy and IDP	TE
	SSA-EQ-3	Lack of information regarding reasonable alternatives to home EV charging for private vehicles where this is not physically possible (i.e. for around 1/3 of UK dwellings), which will limit shift from conventionally fuelled vehicles. TE to work with partners to develop thinking and coordinated response around this issue.	Support transition from conventional fuels	TE assisted by local planning authorities
Biodiversity Natural Capital	SSA-B-1	Engage with responsible authorities (likely to be Local Authorities) during development of Local Nature Recovery Strategies (LNRS) to identify how interventions supported by Transport East can contribute towards net gain targets on strategic scale	Identify a coordinated approach and opportunities for delivering biodiversity and environmental net gain on a strategic scale and contribute to local and national targets	TE assisted by local planning authorities
	SSA-B-2	Engage with partners and authorities to develop a coordinated reporting approach for Nature capital, Biodiversity and Environmental Net Gain for interventions proposed under the Transport Strategy and IDP including establishing a consistent baseline.		
Landscape Heritage Water Soils/geology	SSA-GEN-4	Engage with local authorities on principles for an integrated approach to the protection and management of landscapes and townscapes (including built heritage assets and historic landscapes), flood risk and habitat, development, maintenance and management. This would be an opportunity to consider links to biodiversity net gain, environmental gain, recreation and active travel in relation to the initiatives from the Transport Strategy and IDP	Support a coordinated approach to explore potentially synergies for addressing impacts and opportunities between, landscapes and townscapes, heritage assets, biodiversity, carbon sequestration, and flood risk over the TE region	TE assisted by local planning authorities

ISA objective	ID	Action	Target	Responsible party
Climate	SSA-C-1	Develop common methodology across local authority partners for regular assessment of cumulative carbon emissions associated with interventions implemented under the Transport Strategy, building on baseline assessment currently being undertaken.	Monitor progress towards carbon net zero in 2040 through the 3-5 yearly updates to the IDP and Strategy	TE
	SSA-C-2	Encourage scheme sponsors to require CEEQUAL assessment (or similar), with view to obtaining Very Good or Excellent rating – as a systematic way to include best practice sustainability approaches in design.	Planning consented Schemes supported by Transport Strategy and included in IDP to obtain CEEQUAL or Very Good or Excellent rating (or similar)	TE with partners

Table 9.2: Draft monitoring plan

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
People	P1	Reduction in percentage of areas classified as a 'transport desert'	Percentage of areas classified as transport desert	DfT data on access to public transport services for example - over 500m away from hourly bus or train service mapped using TRACC	Transport Strategy and IDP update schedule 3 – 5 years	TE	TE reporting through updates to IDP and Strategy and reporting in business plan on overall progress
	P2	Improved access to services, education, training and facilities in rural and coastal areas	Engage with partners to agree appropriate baseline and indicators	Sources of data to be agreed with partners – considering DfT data for journey times to services, education, health, employment (to be confirmed)	Transport Strategy and IDP update schedule (3-5 years)	To be agreed with TE partners	TE
Equalities	E1	Maintain or increase accessibility of public transport for people with disabilities	Annual average number of public transport trips taken, and journey length of trips taken by public transport, by people with disabilities	DfT National Transport Survey disability and accessibility statistics	Transport Strategy and IDP update schedule (3-5 years)	To be agreed with TE partners	TE
	E2	Accessible and affordable access to EVs for low income households and people with disabilities	New EV vehicle registrations as a proportion of new vehicle registrations by IMD income deprivation decile	DfT Vehicle Licensing Statistics Charging point location mapping	Transport Strategy and IDP update schedule (3-5 years)	To be agreed with TE partners	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
	E3	Increase proportion of active travel journeys undertaken by older and younger people, women and people with disabilities	Number/proportion of walking and cycling journeys undertaken by people aged under 16, over 65, women and people with a disability	DfT National Transport Survey disability and accessibility statistics DfT National Transport Survey: mode by age and gender statistics	Transport Strategy and IDP update schedule (3-5 years)	To be agreed with TE partners	TE
Health	H1	Significant increased rates of active travel	Annual average number of trips undertaken by walking and cycling	DfT National Transport Survey: mode by region statistics Use of data sources like Strava Metro and travel surveys as supplementary evidence.	Transport Strategy and IDP update schedule (3-5 years)	To be agreed with TE partners	TE
	H2			<ul style="list-style-type: none"> ▪ Percentage of adults walking for travel at least three days per week ▪ Percentage of adults cycling for travel at least three days per week ▪ Percentage of children walking for travel at least 3 days per week ▪ Percentage of children cycling for travel at least 3 days per week 			

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
Safety	S1	Reduction in transport crime	Crime incident rates: In rail stations or on trains In bus stations or on buses	British Transport Police rail crime dataset Bus crime statistics (source to be confirmed with police /bus operators) Incident records from rail and bus operators	Transport Strategy and IDP update schedule (3-5 years)	British Transport Police Police Rail and bus operators	TE
	S2	Zero KSIs by 2050 – regional ambition	Number of KSI road traffic collisions	Department for Transport (DfT) road accidents and safety datasets	Annually/Dependent on Transport Strategy and IDP update schedule (TBC)	DfT	TE
	S3	Reduction in road traffic collisions and accidents, including within vulnerable groups	<ul style="list-style-type: none"> ▪ Number of road collisions causing personal injury ▪ Number of road collisions involving vulnerable group 	Department for Transport (DfT) road accidents and safety datasets Vulnerable groups to be agreed with each LTA	Transport Strategy and IDP update schedule (3-5 years)	DfT and LTAs	TE
Biodiversity	B1	Minimum 10% biodiversity net gain across all planning consent schemes supported by TE	Biodiversity net gain associated with TE supported schemes	Defra biodiversity metric 3.0 (or updated version) calculation output prepared as part of project level environmental assessment (see SSA-GEN 2) Also high level assessment of IDP with scheme GIS information	Transport Strategy and IDP update schedule (3-5 years)	Local transport authorities NR and national Highways LPAs	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
				Area of land/ total units to be created where offsite habitats are allocated/ funded or implemented to meet net gain obligations (See SSA- Bio 3)	Transport Strategy and IDP update schedule (3-5 years))	TE, assisted by local transport authorities/ LPAs	TE
	B2	No loss of irreplaceable habitat or loss of condition or area of protected sites	Area of loss or degradation of irreplaceable or protected sites recorded by type	Scheme GIS Information and project information templates completed by responsible authority/sponsor (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	Local transport authorities National Highways (Scheme sponsors)	TE
	B3	Increase in active travel routes created using part of green infrastructure network such as new footpaths, cycle ways	Added length/area of green infrastructure network across the TE region	Engage with local authorities to establish baseline data and develop Scheme GIS Information and project information templates completed by responsible authority/sponsor (see SSA-GEN 2) County level green infrastructure mapping	Transport Strategy and IDP update schedule (3-5 years)	Local authorities/ local transport authorities	TE
	B4	Decrease in nitrogen deposition within European	No of schemes predicting improvement or reduction in levels of nitrogen deposition for	Scheme GIS Information and project information templates	Transport Strategy and IDP update schedule (3-5 years)	Local transport authorities	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
		sites or SSSIs with sensitive habitats (Linked with air quality objectives)	sensitive sites based on qualitative assessment or air quality modelling for proposed schemes.	completed by responsible authority/sponsor (see SSA-GEN 2)			
Water	W1	Decrease in number of WFD watercourses in TE area where 'Transport drainage' is a Reason for Not Achieving Good (RNAG)	WFD waterbody environment Agency RNAG datasets Engage with partners to identify data sources for regional analysis	Environment Agency (EA)	TBC Transport Strategy and IDP update schedule (3-5 years)	Environment Agency	TE
	W2	No net increase in flood risk vulnerability to transport network or communities	Loss of floodplain from IDP schemes Change to strategic transport network considered vulnerable to flood events	Project information templates completed by responsible authority/sponsor (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	Local transport authorities/local authorities	TE
Air	A1	Reduction in concentrations of transport related air pollutants monitored by EHOs within the TE region	NO _x , PM _{2.5} , PM ₁₀ , SO _x and CO from Automatic Urban and Rural Network monitoring (AURN) and from EHOs	Defra UK Air Information Resource datasets and Local EHO data	Transport Strategy and IDP update schedule (3-5 years)	Defra	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
	A2	Reduce to zero the number of AQMAs where transport is identified as the primary source of pollutant emissions	Number of AQMAs where transport emissions identified as primary source of pollutant emissions	Defra UK Air Information Resource datasets Local authority Air Quality Annual Status Reports	Transport Strategy and IDP update schedule (3-5 years)	Local authorities	TE
	A3	Net improvement to air quality	Indicator to be agreed for example - number (approx.) of people benefiting from improved air quality vs affected by reduced air quality	Engage with partners to develop a methodology to capture impacts of transport related schemes Project level environmental assessments - scheme GIS information and project information templates completed by responsible authority/sponsor (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	Local transport authorities NR National Highways	TE
Noise	N1	Reduction in population exposed to road and rail noise emissions	Population exposed to noise levels above SOAEL	Defra Noise Exposure data Project level information on noise impacts (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	Defra	TE
	N2	Reduction in number of road and rail NIAs	Number of NIAs within Transport East region	Defra strategic noise mapping	Transport Strategy and IDP update schedule (3-5 years)	Local authorities	TBC

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
Climate	C1	Reduce carbon emissions from transport to net zero by 2050	Predicted carbon emissions for the IDP implementation	Transport East's developing trajectory assessment which will inform methodology for monitoring	Transport Strategy and IDP update schedule (3-5 years)	TE	TE
	C2	Proportion of the transport network/fuels in the TE region to be powered offshore wind and renewables	Proportion of public EV chargers powered by renewable sources	Establish data sources for regional renewable energy level Establish methodology for estimating EV charging use	Transport Strategy and IDP update schedule (3-5 years)	TE	TE
	C3	Modal shift of containerised freight from road to rail	Proportion of containerised freight transported by rail	Current & future number of containers on rail	Transport Strategy and IDP update schedule (3-5 years)	TE	TE
	C4	Increase patronage on public transport	Numbers using public transport by type	DfT data on public Transport use.	Transport Strategy and IDP update schedule (3-5 years)	TE	TE
	C5	Reduction construction carbon including embodied carbon emissions associated with infrastructure construction for IDP interventions	Commitment to use PAS 2080 for infrastructure carbon management (or equivalent schemes) This does not cover vehicle lifecycle analysis	Scheme information on approach to be taken for carbon management - project information templates completed by responsible authority/sponsor (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
Landscape	L1	No significant adverse effects on statutory and non-statutory landscape designations	Number of schemes within protected or valuable landscape areas	Indicators to be developed based on agreement with partners Scheme GIS information and project information templates completed by responsible authority/sponsor (see SSA-Gen 2 and SSA-Gen 4) Regional mapping of proposed schemes against baseline information	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TBC
Heritage	H1	No significant adverse effects on cultural heritage assets	Significant effects on designated and undesignated heritage assets	Indicator to be developed and agreed with partners Scheme GIS information and project information templates completed by responsible authority/sponsor (see SSA-GEN 2 and SSA-Gen 4)	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TE
Soils/geology	SG1	No loss of peat and wetland soils and high value agricultural land.	Area of best and most versatile (BMV) agricultural land lost	Scheme GIS information and project information templates completed by responsible authority/sponsor	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
			Area of wetland soils lost	(see SSA-GEN 2) Regional mapping of proposed schemes against baseline information.			
Material assets	M1	Existing road, rail and active travel infrastructure reused or recycled	Commitment to apply waste hierarchy and to PAS 2080 for reducing infrastructure carbon	Project information templates completed by responsible authority/sponsor (see SSA-GEN 2)	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TE
	M2	Use of brownfield land over greenfield land where	Land take from brownfield land and greenfield for interventions proposed the strategy (Indicator to be confirmed)	Scheme GIS information and project information templates completed by responsible authority/sponsor (see SSA-GEN 2) (Also Regional Mapping - from natural capital land use analysis)	Transport Strategy and IDP update schedule (3-5 years)	TE and partners	TE
Natural capital	NC1	Environmental net gain	Natural Capital loss/gain compared to baseline information Ecosystem services loss/gain compared to baseline information	(see SSA-GEN 2 and B1 and 2) Analysis at regional level based on information on schemes and regional mapping. There are a range of methodologies ²³⁰ and tools	Transport Strategy and IDP update schedule (3-5 years)	Develop approach with partners Local transport authorities/ Local planning authorities	TE

ISA objective	ID	Target	Indicator	Source	Frequency of data analysis/reporting	Responsibility	
						Information collation	Reporting
				available and being used so a consistent approach would need be agreed.			

10 Next steps

10.1 Consultation and next steps

This ISA Report will be issued for public consultation on 2nd December 2021 to the 30th January 2022 for an eight-week consultation period.

The draft Transport Strategy, draft IDP Approach, ISA report and draft HRA report are all provided at the following link:

<https://www.transporteast.org.uk/public-consultation>

Following consultation, responses to the comments received will be considered and will inform the development of the final Transport Strategy and IDP. A consultation report providing analysis of the comments received will be published.

An ISA Statement will be prepared to set out how the ISA and consultation process has influenced the finalisation of the strategy and this statement and the Habitats Regulations Assessment covering screening and appropriate assessment stages. These reports will be published with the final Transport East Transport Strategy and IDP approach.

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