England's Economic Heartland

ASSESSMENT OF POLICIES

Appendix B to the ISA

JUNE 2020

PUBLIC

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CONTENTS

TABLES

1 INTRODUCTION

1.1.1. The Transport strategy includes 36 policies ranging over a range of policy themes. The strategic policies set out in the Transport Strategy are grouped under the following policy areas:

- Decarbonisation
- Modal shift
- Delivering East West Rail
- East west connectivity
- North south connectivity
- Regional and cross-regional connectivity
- Transport infrastructure
- Local and rural connectivity
- Realising global connectivity in the region
- Freight connectivity

1.1.2. Each of the policies have been assessed using the 13 Sustainability Objectives, using the significance scoring criteria as set out in Table 1-1 below.

Table 1-1 – Key to Effects

Key to Effects	
Potential for significant positive effects	++
Potential for minor positive effects	+
Potential for minor negative effects	-
Potential for significant negative effects	- -
Uncertain effects	?
Negligible or no effect	0

1.1.3. The potential for environmental, economic and social impacts of the strategic policies is described in Section 3 and summarised graphically in Table 2.1 below.

2 OVERVIEW

Table 2-1 below presents an overview of the findings of the policy assessment.

Table 2-1 – Policy Assessment Overview

Policy Theme	Draft TS Policies	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
		Sustainability Objectives												
Decarbonising of our Transport System	**T1** We will support and plan for the decarbonisation of the rail network: with priority given to securing: • Completion of the Midland Mainline electrification • Delivery of East West Rail as an electrified route • Infill electrification schemes that enable electric haulage of rail freight services, in particular those to/from the international gateway port of Felixstowe and to/from national and regional distribution centres •Delivery of a long term solution for the electrification of the Chiltern Main Line	+	++	+	-	-	-	--	--	?	++	++	-	-/+
	T2 We will support and plan for the decarbonisation of the road fleet, working with energy suppliers and local planning authorities to ensure the infrastructure required to support an electric fleet (including buses and freight) is available	?	++	?	?	?	?	?	?	?	?	++	?	?
	T3 In identifying future investment requirements we will prioritise those which contribute to a reduction in single occupancy journeys of 20% (of total traffic flow) by 2040 (compared with 2020)	?	?	+	+	+	+	+	+	0	++	+	0	+
Mobility for the future	**T4** We will work with infrastructure owners and operators to ensure that proposals brought forward for the development of the transport system reduce reliance on the private car by considering the needs of users on the basis of the following hierarchy: i) Active Travel Modes (pedestrians and cyclists) ii) Public transport modes (bus, scheduled coach and rail) iii) Low emission/ zero carbon private vehicles, including two wheeler vehicles iv) Other Motorised modes All proposals to be prepared on the basis that they provide inclusive and accessible travel options for all users	++	+	++	+	+	+	+	+	-/+	++	+	-/+	++
	T5 In identifying future investment requirements we will prioritise proposals on the basis of value for money, their contribution towards achieving net-zero carbon targets, and their contribution to wider sustainability and environmental net gain outcomes	+	++	+	?	+	++	-/+	-/+	-/+	+	++	-/+	+
	T6 We will continue to work with partners, universities, operators and the private sector to leverage our regional 'living laboratories' to trial innovative solutions and apply new business models at scale	?	+	?	?	?	?	?	?	?	?	+	-/+	?
The East West Main Line	**T7** We support the delivery of the East West Rail project (including its Eastern Section), with the expectation that Phase 2 of the Western Section is open from Oxford – Bedford by 2024, Aylesbury – Milton Keynes by 2025 and the Central Section by 2030	+	++	+	+	-	-	- -	-	- -	++	+	- -	-/+
	T8 We will work with Network Rail and the East West Railway Company to prioritise delivery of East West Rail as a digitally connected corridor	+	++	+	?	?	?	?	?	?	0	-/+	?	?
	T9 We will work with the EWRCo, and Network Rail and neighbouring STBs to identify opportunities to realise the longer-term potential of the East West Main Line in support of the economic activity and planned housing growth	+	++	+	0	0	0	0	0	0	?	-/+	?	?

Policy Theme	Draft TS Policies	Sustainability Objectives												
		Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
	T10 We will work with partners, the East West Railway Company and Network Rail to ensure that where the East West Rail corridor intersects existing main lines the opportunity is take to establish regionally significant transport hubs: priority will be given to developing proposals in the following locations: • Oxford Stations • Bicester Stations • Aylesbury Station • Bletchley/Milton Keynes • Bedford Midland Station • East West Rail/East Coast Main Line • Cambridge/Cambridge South Stations	+	++	+	?	-	-	-	-	-	++	+	+	-/+
	T11 We will work with partners to prioritise investment in improved local connectivity connecting East West Rail stations with their local communities	+	++	0	+	-	-	-	-	-	++	-/+	-	-/+
Other East West Arcs	T12 We will prioritise improvements to east west rail connectivity to support economic activity and in support of planned housing growth, including: ▪ A northern arc connecting north Oxfordshire, Northamptonshire and Peterborough ▪ A southern arc connecting central Buckinghamshire, southern Hertfordshire and Cambridgeshire	+	++	+	+	- -	- -	-/+	-	-/+	+	-/+	- -	?
	T13 We will work with Western Gateway and Network Rail to develop proposals that strengthen connectivity between Swindon/Oxford and the South-West and South Wales in support of economic activity and planned growth	+	++	+	+	?	?	-/+	?	-/+	+	-/+	?	?
Improving North South Connectivity	**T14** We will work with Government, Network Rail, Highways England and Oxfordshire County Council to develop a long-term solution to challenges on the Didcot – Oxford – Bicester/Banbury corridor	?	++	?	?	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
	T15 We will work with Network Rail, Government and adjoining Sub-national Transport Bodies to maximise the allocation of released capacity on the classic network as a result of HS2 to benefit connectivity within the region.	+	++	+	+	?	?	?	?	-/+	++	+	?	?
	T16 We will work with Government, Network Rail, adjoining STBs and partners to develop a solution that improves connectivity on the Luton – Bedford – Wellingborough/Kettering – East Midlands corridor	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
	T17 We will work with Cambridge and Peterborough Combined Authority, Cambridgeshire County Council and Peterborough City Council alongside Network Rail and Government to support the priorities identified in the Cambridge Corridor Study	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
	T18 We will work with partners, including Government and Highways England to develop a long-term solution to the challenges of the A1 (East of England) corridor.	+	++	+	+	?	?	-/+	?	-/+	-/+	-	-/+	?
Transforming Intra and Inter	**T19** We will prioritise investment in the development of public transport-based solutions when improving intra-regional connectivity between Regionally Significant Hubs, Areas of Economic Opportunity and Areas of Significant Change	+	++	+	+	-	-	-/+	-/+	-/+	++	+	-/+	?
	T20 To realise our decarbonisation commitments, while supporting economic growth, we will expect infrastructure investment is designed as digitally enabled corridors	+	++	+	?	?	?	?	?	?	+	-	-/+	?

Policy Theme	Draft TS Policies	Sustainability Objectives												
		Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
	T21 We will support investment in the Strategic Road Network and Major Road Network where this meets one or more of the following criteria and is consistent with wider environmental objectives: a) Protects and enhances the existing infrastructure asset b) Delivers a solution to an identified problem on the existing infrastructure asset c) Enables access to new economic opportunities and/or additional housing growth	+	++	+	+	-/+	-/+	-/+	-/+	-/+	- -	- -	+	-
	T22 We will, working with Network Rail, Highways England and public transport operators, identify the level of service required between Regionally Significant Hubs, Areas of Economic Opportunity and Areas of Significant Change to achieve improved intra-regional connectivity: the levels of service will be reviewed on a bi-annual basis	+	++	+	+	-	-	-/+	-/+	?	++	-/+	-/+	-/+
Transport Orientated Development	**T23** We will work with local planning authorities and local enterprise partnerships to use the opportunities created by investment in strategic transport infrastructure and services to shape the location of future economic and housing growth proposals. We will work with partners to ensure integration of travel modes and local connectivity are integral components of any such proposals	+	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
	T24 We will support the development and delivery of high quality, segregated mass transit systems where there is the potential market for its long term sustainability: priority will be given to supporting the delivery of such systems in the following locations: • Cambridge (the CAM) • Milton Keynes • The A414 corridor in Hertfordshire	+	++	+	++	- -	- -	-	-	-/+	+	+	-	-/+
Improving Local Connectivit	**T25** We will work with partners to establish 'mobility hubs' in areas of significance as locations where interchange between travel modes is actively enabled.	+	++	++	?	-/+	-/+	-/+	-/+	-/+	+	-/+	-/+	-/+
	T26 We will work with public transport operators and the Government to develop industry-led solutions that enable frictionless travel using a combination of travel modes	+	++	+	+	-/+	-/+	?	?	?	+	+	-/+	+
Rural Connectivity	**T27** We will work with partners to develop tailored solutions for our smaller market towns and rural areas that improve local connectivity, including exploring options for centres of mobility.	++	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
Connecting to Global Markets	**T28** We will work with infrastructure owners/operators, Network Rail, Highways England and the Government to improve public transport connectivity to international airports in order to reduce the environmental footprint of their operations, with priority given to: • Luton Airport – with a focus on improving travel opportunities via services on the Midland Mainline, and ensuring the right level of service and capacity on the Direct Air Rapid Transit service (DART) • Heathrow Airport – with a focus on improved interchange and connectivity via the Old Oak Common transport hub, and through delivery of Western Rail Access to Heathrow	+	++	-/+	+	- -	- -	-	-	-/+	- -	- -	-/+	- -
	T29 We will work with relevant Sub-national Transport Bodies, as well as Network Rail and Highways England, to prioritise the development of proposals that enable improved connectivity along the key inter-regional corridors: priority will be given to identifying solutions to future needs on the following corridors: • Swindon/Southampton – Reading – Didcot/Oxford – West Midlands • London – Luton – Bedford – East Midlands	+	++	+	?	-/+	-/+	-/+	-/+	-/+	-/+	-	-/+	-

Policy Theme	Draft TS Policies	Sustainability Objectives												
		Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
Realising the Potential for Rail Freight	**T30** We will work with Network Rail and all relevant Sub-national Transport Bodies to develop proposals that increase freight on the rail network with priority given to the following corridors: • Felixstowe to Nuneaton • East West Railway • Southampton to West Midlands	?	++	-/+	++	-/+	-/+	-/+	-/+	-	++	+	-/+	-
	T31 We will work with Network Rail and all relevant Sub-national Transport Bodies to maximise the conveyance of construction materials by rail with priority given to the following corridors: • Midland Main Line – providing access into the region from aggregate sources in the Midlands • Great Western Main Line – providing access into the region from aggregate sources in western England and Wales	?	++	-/+	++	-/+	-/+	-/+	-/+	-	++	+	-/+	-
Strategic Rail Freight Interchanges	**T32** We will support the development of Strategic Rail Freight Interchanges where they support the ambition of this strategy	?	++	-/+	+	- -	- -	-/+	-/+	-	++	+	-	-
Supporting Road Freight	**T33** We will work with Highways England, local highway authorities and the freight sector to ensure that strategic corridors for road freight and logistics are fit for purpose: priority will be given to the following corridors: • The M25/M1 • The A34 and M40 north of Oxford • The A14 • The A508 into Northampton	+	+	?	+	--	--	-	?	?	-/+	--	?	-
	T34 We will work with Highways England, local highway authorities and the freight sector to use improved planning and the application of innovative solutions to reduce the impact of freight on the environment, in terms of carbon emissions and its impacts on communities living in and around freight corridors.	+	+	+	+	+	+	+	+	?	++	++	-/+	+
	T35 We will work with Highways England, local highway authorities and the freight sector to address the need for secure overnight lorry parking	0	+	0	++	?	?	-	-	-	-	-	-/+	-
	T36 We will work with local transport authorities and the freight and logistic sector to ensure the local servicing and support needs of the business community are met	+	++	+	+	0	0	0	0	0	0	0	0	0

3 POLICY ASSESSMENT SUMMARIES

3.1.1. The tables presented below show the summaries of each of policy assessments, arranged by policy themes.

Table 3-1 – Decarbonising of our Transport System

Policy Theme: Decarbonising of our Transport System	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T1 SA Score:	+	++	+	-	-	-	--	--	?	++	++	-	-/+
T2 SA Score:	?	++	?	?	?	?	?	?	?	?	++	?	?
T3 SA Score:	?	?	+	+	+	+	+	+	0	++	+	0	+
T1 We will support and plan for the decarbonisation of the rail network: with priority given to securing: • Completion of the Midland Mainline electrification • Delivery of East West Rail as an electrified route • Infill electrification schemes that enable electric haulage of rail freight services, in particular those to/from the international gateway port of Felixstowe and to/from national and regional distribution centres •Delivery of a long term solution for the electrification of the Chiltern Main Line between Birmingham and London Marylebone	**Population and Equalities:** The delivery of the Midland Mainline modification, Chiltern Mainline electrification and East West Rail (Policy T1) is likely to have positive effects on the populations living in the EEH region. As per the sustainability objective, these schemes could help to increase the capacity, connectivity and efficiency of the transportation network to support future population growth across the region. The decarbonisation of the road fleet (Policy T2) is unlikely to address wider place-based concerns for poor journey time reliability in rural areas. However, decarbonisation will help to prepare for and protect society from changes in the future such as climate change. Policy T2 is also unlikely to benefit those from low income and/or carless households as they may not be able to afford electric vehicles and/or their maintenance. Some households may, however, be able eligible for a plug-in grant from the government, which could make electric vehicles more affordable and accessible. Policy T3 is unlikely to address wider place-based concerns for poor journey time reliability in rural areas, and unlikely to benefit low income/ carless households; however, it could provide opportunities to ride share that is specially configured to service rural communities. **Economy:** The delivery of a decarbonised road and rail network will help to support a shift towards a more efficient, low carbon and sustainable economy. Given that the region is one of the world's leading economic regions, with much of its success being founded on science and technology innovation, it is likely that these policies will help to support continued economic success in the region. Economic benefits of decarbonising both the road and rail network could be sought through investment in innovative technology development, and development of sustainable supply chains. The policies could also help to increase further employment within the region, the longevity of which could be made more secure by a transport network that is future ready. The development of a new route brings the potential for positive development. Policy T1 could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. The reduction in single occupancy journeys (Policy T3) could make accessing jobs and services more difficult, especially for those in rural areas who are more reliant upon their cars. However, it could provide opportunities for employers to encourage lift sharing and introduce schemes such as cycle to work to help contribute to the reduction in single occupancy journeys. This could support the delivery of a low carbon economy as per the sustainability objective, but as outlined above, it is dependent upon how this is implemented. **Health:** Addressing decarbonisation will deliver a range of co-benefits including improved public health and reduced air and noise pollution. All three polices could help to improve the places in which people live and work, improving health and wellbeing and outcomes of future generations. Policy T1 offers greater connectivity, which may make facilities easier to access, particularly for those who may not be able to access on foot or car at present. However, a new transport network may also be more expensive, which could create a financial barrier. It is not clear if these outcomes will proportionate and support all vulnerable groups within the region, which will depend upon the schemes themselves to ensure this objective is met. This could include things such as design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments. There are also additional safety concerns for those with visual impairments and the introduction of an electric fleet. These are likely to be quieter and harder hear; however, a European ruling in 2019, specifies that from 2021 all new types of four-wheel electric vehicle must be fitted with devices, which sounds like a traditional engine. Advances in new technology may include automatic braking for hazards, which could improve safety for the most vulnerable road users. There are potential issues with obstructive charging facilities (e.g. trailing cables), which can put pedestrians, particularly people with disabilities or pushchairs at risk.											

Policy Theme: Decarbonising of our Transport System	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T1 SA Score:	+	++	+	-	-	-	--	--	?	++	++	-	-/+
T2 SA Score:	?	++	?	?	?	?	?	?	?	?	++	?	?
T3 SA Score:	?	?	+	+	+	+	+	+	0	++	+	0	+
T2 We will support and plan for the decarbonisation of the road fleet, working with the private sector, the energy sector, local authorities and Highways England to ensure the infrastructure required to support an electric fleet (including buses and freight) is available	**Community Safety:** There are concerns that that electric vehicles are too quiet, putting pedestrians at risk, as they cannot be heard as they approach; however, a European ruling in 2019, specifies that from 2021 all new types of four-wheel electric vehicle must be fitted with devices, which sounds like a traditional engine. There are potential issues with obstructive charging facilities (e.g. trailing cables), which can put pedestrians, particularly people with disabilities or pushchairs, at risk. There are additional safety concerns with the electrification of the railways (Policy T1); whilst there is no danger to people using the railway correctly, there may be a risk for nearby land users e.g. farmers and anglers. The proposed reduction in single occupancy journeys (Policy T3) is likely to have positive effects on community safety. There is potential that the policy could result in a reduction in the number of cars on the road, which is likely to help reduce levels of congestion and accidents and near misses (involving cars, and non-motorised users). **Biodiversity:** Although the policies do not support the sustainability objective directly, decreases in CO_2 emissions from decarbonisation may indirectly benefit the biodiversity in the region. However, the proposals as part of Policy T1 could result in the disturbance and loss of biodiversity as part of their construction and operation (e.g. noise pollution, loss of habitats etc..) through land take. The size and scale of the of the infrastructure needed to support an electric fleet (including buses and freight) (Policy T2) is unknown but has the potential to negatively affect biodiversity through land take and the disruption and disturbance of habitats. The reduction in single occupancy journeys (Policy T3) could lessen the impact of disturbance on the region's biodiversity, through decrease traffic noise and levels of air pollution. **Natural Capital and Ecosystem Services:** Although the policies do not support the sustainability objective directly, decreases in CO_2 emissions from decarbonisation may indirectly benefit the biodiversity in the region. However, the proposals as part of Policy T1 could result in the disturbance and loss of biodiversity as part of their construction and operation (e.g. noise pollution, loss of habitats etc..) through land take. The size and scale of the of the infrastructure needed to support an electric fleet (including buses and freight) is unknown, but again Policy T2 has potential to negatively affect natural capital and ecosystem services, however these may be at a smaller scale. It should however be noted that East West Rail has committed to biodiversity net gain, which has potential to contribute positively to the region's natural capital and subsequent ecosystem services. If other projects coming forward also commit to this there is potential for these policies to have a more positive effects on natural capital and ecosystem services. The reduction in single occupancy journeys (Policy T3) could lessen the impact of disturbance on the region's biodiversity, through decrease traffic noise and levels of air pollution.											

Policy Theme: Decarbonising of our Transport System	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T1 SA Score:	+	++	+	-	-	-	--	--	?	++	++	-	-/+
T2 SA Score:	?	++	?	?	?	?	?	?	?	?	++	?	?
T3 SA Score:	?	?	+	+	+	+	+	+	0	++	+	0	+

T3 In identifying future investment requirements we will prioritise those which contribute to a reduction in single occupancy journeys of 20% (of total traffic flow) by 2040 (compared with 2020)

Landscape and Townscape: Townscape, landscape, sense of place and visual amenity could all be negatively affected through the development of the electrification of rail network (Policy T1), in particular through the introduction of overhead infrastructure. However, in the future, with advances in technology, trains are more likely to run via battery without the need for overhead wires. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. The size and scale of the of the infrastructure needed to support an electric fleet (including buses and freight) (Policy T2) is unknown but has the potential to negatively affect the townscape and landscape through land take. Both policies T1 and T2 both have potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. The reduction of single occupancy journeys will help to reduce both noise and air pollution, which in some areas could result in increased tranquillity and contribute to overall sense of place.

Historic Environment: Heritage assets and their settings could be negatively affected through the development of the electrification of rail network (Policy T1), in particular through the introduction of overhead electrical wires. However, in the future, with advances in technology, trains are more likely to run via battery without the need for overhead wires. The size and scale of the of the infrastructure needed to support an electric fleet (including buses and freight) is unknown, but again Policy T2 has potential to negatively affect the historic environment. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. The reduction in single occupancy journeys will help to reduce air pollution, which could help prevent further degradation of some of the region's unique historic assets. The reduction in noise pollution from lower levels of traffic in some areas could result in increased tranquillity, contribute to overall sense of place and the unique setting of heritage assets.

Water Environment: The electrification of the East West Rail scheme could result in modifications and discharges to watercourses. The development of schemes in both policies T1 and T2 could result in increased land take and the introduction of hard impermeable surfaces, which could increase the levels of flooding. Mitigation measure could, however, be put in place to reduce this impact. The electrification of existing routes may not be as damaging to the water environment, as development would be to existing railway land. All three policies could help the region become more resilient to climate change, through the reduction to CO_2 emissions, which indirectly could reduce the likelihood of an increased risk of flooding, as per the sustainability objective.

Air Quality: All three policies could result in a reduction in road traffic volumes through the electrification of freight, which in turn could reduce transport related emissions, improving air quality. This is likely to have beneficial effects on human health, landscape and townscape, the historic environment, biodiversity and natural capital. The shift towards an electric fleet as per Policy T2, could reduce current levels of transport emissions, however, it may not reduce the number of cars on the roads. There are also additional concerns with emission of particulates from tyre wear and brake dust.

Climate Change and Greenhouse gases: Support and planning for the decarbonisation of the rail network through electrification (Policy T1) will likely reduce GHG emissions overall. There is the potential for this decarbonisation to encourage modal shift towards rail use as the carbon agenda continues to get more traction, however, there are several other factors that may influence this. Construction will result in an increase in GHG emissions through the large quantities of carbon associated with the construction process. Once operational, there will be a reduction in GHG emissions through the electrification of the rolling stock. The vulnerability of the electrified rail network and road infrastructure would depend on whether the networks that are being worked on are situated in vulnerable areas and the resilience of the design and materials used to withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures changes). Climate change generally negatively effects the operation of the rail network, for example, flooding, snowfall, high temperatures and wind. The infrastructure needed to electrify the rail network may bring some new issues in relation to climate change (e.g. wind issues with electrified overhead lines). With future trends on climate change predicting harsher climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. Further GHG emissions reductions could be achieved through the decarbonisation of electricity purchase or investment in on-site renewables to power the rolling stock. Depending on the proposed investments being considered and the weighting or stringency of the requirements being considered, there is uncertainty in extent to which GHG emissions could be reduced, through Policy T3. However, as single occupancy vehicles are a carbon intensive form of travel, identifying future investment requirements that positively contribute to the reduction in single occupancy journeys by 2040 will likely reduce GHG emissions overall.

Policy Theme: Decarbonising of our Transport System	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T1 SA Score:	+	++	+	-	-	-	--	--	?	++	++	-	-/+
T2 SA Score:	?	++	?	?	?	?	?	?	?	?	++	?	?
T3 SA Score:	?	?	+	+	+	+	+	+	0	++	+	0	+

Soil, Land Use, Resource and Waste: It is unlikely that electrification of existing railway lines would cause negative effects on best and most versatile soils on agricultural land, as works would likely be on existing railway land. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new electrified routes such as East West Rail, could result in the loss of land, including 'Best and Most Versatile' agricultural land. They're likely to result in larger scale construction, comprising use of natural resources and generation of waste. The size and scale of the of the infrastructure needed to support an electric fleet (including buses and freight) is unknown, but again Policy T2 has potential to negatively affect Soil, Land Use, Resource and Waste if larger scale developments with large land take were to come forward. Single occupancy journeys could help to reduce the need for frequent road maintenance, which could help reduce resource use and waste, however, this is unlikely to be significant and therefore, a neutral effect has been identified.

Noise and Vibration: Policy T1 aims to decarbonise the rail network, with the replacement of traditional diesel trains with electric stock. As electrification progresses across the EEH region, it will help contribute to reducing noise at source. The electrification of the road fleet (Policy T2) will also help to reduce noise pollution, however, European ruling in 2019 stated that from 2021 all new types of four-wheel electric vehicle must be fitted with devices, which sounds like a traditional engine to ensure safety to vulnerable road users. There is potential that an increase in electricity required to supply and charge an electric fleet could have associated noise impacts, however, at this stage, this is not known for certain and could be assessed through the EIA process, once proposals come forward. The reduction of single occupancy journeys (as per Policy T3) is likely to have positive effects on noise pollution, through reduce traffic noise. As stated above, this is also likely to have beneficial effects on townscape, landscape, health, biodiversity and the historic environment through increased levels of tranquillity and contributions to placemaking.

Table 3-2 – Mobility for the Future

Policy Theme: Mobility for the Future	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T4 SA Score:	++	+	++	+	+	+	+	+	-/+	++	+	-/+	++
T5 SA Score:	+	++	+	?	+	++	-/+	-/+	-/+	+	++	-/+	+
T6 SA Score:	?	+	?	?	?	?	?	?	?	?	+	-/+	?
T4 We will work with infrastructure owners and operators to ensure that proposals brought forward for the development of the transport system reduce reliance on the private car by considering the needs of users on the basis of the following hierarchy: i) Active Travel Modes (pedestrians and cyclists) ii) Public transport modes (bus, scheduled coach and rail) iii) Low emission/ zero carbon private vehicles, including two wheeler vehicles iv) Other Motorised modes All proposals to be prepared on the basis that they provide inclusive and accessible travel options for all users	**Population and Equalities:** The prioritisation of non-motorised vehicles, electric vehicles and mobility scooters above public transport and private vehicles is likely to improve access for all groups inclusively only if the infrastructure is there for them to run on, to a good standard, and a wider network than presently. Improved connectivity (Policy T4) may also help those in more rural areas access the public transport network, enabling them to access jobs and services. The prioritisation of non-motorised modes may also help low income families and those living in areas of deprivation, access free transports modes e.g. new footpaths and cycleways. Policy T5 aims to priorities proposals on the basis of value for money, which could mean that they will be result in modes that will be more accessible for all population groups, reducing financial barriers. Through investment in 'living laboratories' (Policy T6), depending on the technology brought forward and research undertaken, the transport network could be made easier for people to understand (e.g. up to date reliable traffic and train time information through smart phone apps), potentially encouraging more people to use the public transport network. However, it is not clear how this policy will benefit those elderly members of the population and/or those lower income groups without access to a smart device, who may not benefit so greatly from this policy. Any research undertaken will have to be accessible to all groups to enable everyone to experience the potential benefits be more specific about those with sensory impairments (visual or audio), neurotypical (dyslexia dyspraxia, autism etc), mobility/stability issues (Parkinson's, MND, Hodgkin's). **Economy:** The prioritisation of non-motorised modes within Policy T4, could result in a greater number of cycleways and footpaths. Provision of cycling and walking routes can help to make positive contributions to the economy through increase visitor numbers, tourism and the potential development of supporting businesses e.g. cycle hire. Improved connectivity may also help those in more rural areas access the public transport network, enabling them to access jobs and services. Supporting proposals which achieve net- zero carbon targets (which may include more efficient transport systems such as rail), will help shift towards a more efficient, low carbon and sustainable economy. New transport is likely to contribute to and enhance wider and long-term economic prosperity by facilitating the building of a strong economy, by providing reliable and affordable transport choice to support growth. The extent of growth will be dependent on the current economic landscape, the economic centres served, and the scale of the intervention proposed. Not only will 'living laboratories' provide research jobs for people within the region, technological advancements to the transport network will improve the connectivity and efficiency, allowing better travel between main employment and economic hubs. Given that the Heartland is one of the world's leading economic regions, with much of its success being founded on science and technology innovation, it's likely that this policy will help to support continued economic success in the region. **Health:** The prioritisation of non-motorised vehicles, electric vehicles and mobility scooters above public transport and private vehicles is likely to improve access for all groups inclusively and help support more active lifestyles see earlier caveats. The prioritisation of non-motorised modes may also reduce air quality emissions (such as NO2, NOx, PM10), which would also result in a beneficial impact to health. People are more likely to choose active travel for journeys if there are suitable networks to travel on. Provision of cycle/footpaths between rural settlements and onward to urban centres will reduce severance, improve accessibility to jobs, services, healthcare and amenities and will open up access to the countryside. Supporting proposals which achieve net- zero carbon targets (which may include more efficient transport systems such as rail and new cycleways and walkways), may result in reduced emissions, having a beneficial impact to the health in terms of better air quality, reduced noise emissions and encouraging healthier lifestyles. Policy T5 aims to contribute to wider sustainability and environmental net gain outcomes, this could see the incorporation natural features such as tree planting, hedgerows, which could result in enhanced connections to nature. This could result in reduced stress levels, contributing to mental health and wellbeing benefits. Innovative solutions (through Policy T6) could be implemented to improve the efficiency of cars, including traffic management measures to reduce congestion and the development of electric cars and bikes, which will help to improve air quality. In addition, technological advancements in traffic data, informing network users of collisions and delays can have the potential to reduce stress levels. However, effects will be determined by the level of investment into 'living laboratories', and the types of innovative solutions												

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T4 SA Score:	++	+	++	+	+	+	+	+	-/+	++	+	-/+	++
T5 SA Score:	+	++	+	?	+	++	-/+	-/+	-/+	+	++	-/+	+
T6 SA Score:	?	+	?	?	?	?	?	?	?	?	+	-/+	?
T5 In identifying future investment requirements we will prioritise proposals on the basis of value for money, their contribution towards achieving net-zero carbon targets, and their contribution to wider sustainability and environmental net gain outcomes	brought forward. It may be determined that some technological advancements cannot be implemented across the whole region due to connectivity issues and potentially a lack of appetite in rural, more elderly communities. Innovative solutions may also require access to and knowledge of how to use smart phones and other smart devices. Those elderly members of the population and/or those lower income groups without access to smart devices, may not benefit so greatly from this policy. Digital divides could inhibit the widespread implementation of robust and reliable innovative solutions. **Community Safety:** The prioritisation that Policy T4 gives to pedestrians, cyclists, wheelchair and mobility scooter users, is likely to have positive effects for community safety. If carefully designed, the provision of off-road routes for cyclists and pedestrians will reduce the number of collisions involving them. The policy also states that they will provide inclusive and accessible travel option for all users, which could ensure that providing a safe transport network is given greater consideration. Pedestrian and cycle routes should be well lit to help reduce fear and deter criminal activity. Where cyclists and pedestrians have to share the road with traffic, traffic should be slowed down, and calming measures introduced. Both policies T5 and T6 could result in future investment into increase public safety (through the introduction of better accident reporting, smart motorways etc), however, it is not clear whether this will be a priority. Achieving net-zero, may see the increase in electrified transport modes such as trains and cars. There are concerns that that electric vehicles are too quiet, putting pedestrians at risk, as they cannot be heard as they approach, as well as potential issues with obstructive charging facilities (e.g. trailing cables), which can put pedestrians, particularly people with disabilities or pushchairs, at risk. There are additional safety concerns with the electrification of the railways; whilst there is no danger to people using the railway correctly, there may be a risk for nearby land users e.g. farmers and anglers. **Biodiversity:** Policy T4 does not support the sustainability objective directly but decreases air quality emissions (such as the deposition of nitrogen from NO2/NOx) from the prioritization of non-motorised modes of travel, may indirectly benefit the biodiversity in the region. Cycle routes and footpaths also present opportunities to enhance habitats and ecological networks. Policy T5 aims to prioritise proposals on the basis of their contribution towards achieving net-zero carbon targets, and their contribution to wider sustainability and environmental net gain outcomes. This could see the impact of future development on biodiversity compensated for and could present opportunities to provide biodiversity net gain. Trailing of innovative solutions could help to support developments that contribute to biodiversity either directly (incorporation of planting and habitat creation) or indirectly (electric bikes and cars reducing air and noise pollution). **Natural Capital and Ecosystem Services:** Policy T4 does not support the sustainability objective directly but decreases air quality emissions (such as the deposition of nitrogen from NO2/NOx) from the prioritization of non-motorised modes of travel, may indirectly benefit natural capital in the region. Natural capital enhancements are possible through the connection of green spaces and protection of habitats linking population centres which may otherwise be lost of severed through a lack of maintenance or through other development. Cycle routes and footpaths also present opportunities to enhance habitats and ecological networks. Policy T5 aims to prioritise proposals on the basis of their contribution towards achieving net-zero carbon targets, and their contribution to wider sustainability and environmental net gain outcomes. This could see the impact of future development on natural capital and ecosystem services compensated for and could present opportunities to provide biodiversity net gain, increasing the region's natural capital stock. Trialling of innovative solutions could help to support developments that contribute to natural capital either directly (incorporation of green spaces and habitat creation) or indirectly (electric bikes and cars reducing air and noise pollution).												

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T4 SA Score:	++	+	++	+	+	+	+	+	-/+	++	+	-/+	++
T5 SA Score:	+	++	+	?	+	++	-/+	-/+	-/+	+	++	-/+	+
T6 SA Score:	?	+	?	?	?	?	?	?	?	?	+	-/+	?
T6 We will continue to work with partners, universities, operators and the private sector to leverage our regional 'living laboratories' to trial innovative solutions and apply new business models at scale	**Landscape and Townscape:** Policy T4 could result in the addition of new cycleways and footpaths, through the prioritization of non-motorised modes. New walkways and cycleways are unlikely to have a negative effect on the landscape, provided the new route is chosen carefully and design appropriately to its setting. Well-designed walkways and cycleways can contribute to the sense of place and appearance of an area and could present opportunities to enhance the quality of visual amenity of townscapes by managing public access through the region's towns. Increased access to towns and villages across the region may also have beneficial effects on place making, through the shaping the public realm in order to maximise shared value by paying particular attention to the physical, cultural, and social identities that define a place, whilst supporting its ongoing evolution. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact. It is not clear on the potential proposals that could come forward as a result on Policy T5, however, if large land take is required there is potential for this to result in negative impacts on the landscape and townscape. However, the policy aims to achieve net-zero and contribute to wider sustainability outcomes, which could mean that development will be more sensitive to the region's unique landscape and townscapes. The impact of Policy T6 on the landscape and townscape is uncertain and would highly depend upon the types developments brought forward and the infrastructure needed to support them. Larger scale infrastructure (e.g. masts to support digital infrastructure) may be obstructive and deter from the landscape and townscape, whilst smaller scale solutions (e.g. e-bikes) may not require large infrastructure and could be easily incorporated within the existing landscape and townscape. **Historic Environment:** Policy T4 could result in the addition of new cycleways and footpaths, through the prioritization of non-motorised modes. New walkways and cycleways are unlikely to have a negative effect on designated heritage sites or their settings, provided the new route is chosen carefully and design appropriately to its setting any land take can impact heritage assets. Well-designed walkways and cycleways could present opportunities to enhance the quality of visual amenity of heritage assets by managing public access to or from the historic features and through the region's towns. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. The preference of non-motorised transport will help to reduce air pollution, which could help prevent further degradation of some of the region's unique historic assets. The reduction in noise pollution from lower levels of traffic in some areas could result in increased tranquillity, contribute to overall sense of place and the unique setting of heritage assets. It is not clear on the potential proposals that could come forward as a result on Policy T5, however, if large land take is required there is potential for this to result in negative impacts on the historic landscape. New facilities may erode the townscape character and the setting of built heritage and there may be a particular impact on buried archaeology, historic landscapes and a potential impact on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. However, the policy aims to achieve net-zero and contribute to wider sustainability outcomes, which could mean that development will be more sensitive to the region's unique historic landscape. The impact of Policy T6 on the landscape and townscape is uncertain and would highly depend upon the types developments brought forward and the infrastructure needed to support them. Larger scale infrastructure (e.g. masts to support digital infrastructure) may erode the historic environment, whilst smaller scale solutions (e.g. e-bikes) may not require large infrastructure and could be easily incorporated within the existing historic environment. **Water Environment:** Policy T4 could result in the addition of new cycleways and footpaths, through the prioritisation of non-motorised modes. Walkways and cycleways (including on-road cycle routes and off-road cycle paths) are unlikely to significantly affect water resources or contribute to flooding. They could, however, be vulnerable to flooding and poor drainage though, which would curtail their accessibility for most users. There could be the opportunity to include adaptation measures in design relation to flood risk and choice of materials. It is not clear on the potential proposals that could come forward as a result on Policy T5, however, if large land take is required there is potential for this to result in negative impacts on the water environment. However, the policy aims to achieve net-zero and contribute to wider sustainability outcomes, which could mean that development could incorporate designs to protect the water environment and protect against flooding. The impact of Policy T6 on the water environment is uncertain and would highly depend upon the types developments brought forward and the infrastructure needed to support them. Larger scale infrastructure (e.g. masts to support digital infrastructure) may result in the replacement of greenspaces with sealed surfaces reduces which could limit the ability to reduce flooding water run-off, whilst smaller scale solutions (e.g. e-bikes) may not require large infrastructure and could less detrimental on the water environment. **Air Quality:** The prioritisation of non-motorised modes and the potential additions of new walkways and cycleways would help encourage a modal shift, leading to reductions in air pollution from the transport network. This is likely to have additional beneficial effects on health and wellbeing, biodiversity natural capital and ecosystem services. The development of schemes that support wider sustainability outcomes (Policy T5) will also result in a more efficient transport network, which may also lead to a reduction in emissions across the region. By promoting scheme which include cycleways and walkways could also contribute to reduced emissions and a more towards more sustainable travel. Policy T5 also aims to prioritise schemes that support net-zero, has the potential to provide co-benefits through reduced air pollution. Advancements in technology have the potential to improve air quality, for example, traffic management measures (such												

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T4 SA Score:	++	+	++	+	+	+	+	+	-/+	++	+	-/+	++
T5 SA Score:	+	++	+	?	+	++	-/+	-/+	-/+	+	++	-/+	+
T6 SA Score:	?	+	?	?	?	?	?	?	?	?	+	-/+	?

as speed cameras, and smart phone apps to alert road users where there is traffic on the road so they can avoid those route) to reduce congestion on the network can reduce idling cars, and therefore improve local air quality, especially in the city centres across the region. Additionally, development of electric vehicles will result in a reduction of emissions, and an increase in car sharing due to social media technology can also result in an improvement in air quality across the region. However, this Policy currently doesn't outline the research proposed, and whether this will have the potential to be rolled out across the region.

Climate Change and Greenhouse gases: The user hierarchy prioritises lower GHG emitting modes of transports over others, which will likely reduce GHG emissions. Maintenance of existing infrastructure and the development of any new infrastructure, even for lower GHG emitting modes of transport, will result in an increase in GHG emissions through carbon emissions from the construction process. Upgrading or repurposing existing infrastructure will have embodied carbon but may be significantly less than new infrastructure. Minimising the development of new infrastructure and prioritising lower GHG emission transport modes will likely result in a decrease in GHG emissions. The vulnerability of a transport system (including digital infrastructure and potential energy supply demands) developed on the basis of the user hierarchy would depend on several factors. This would include whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. The level of effect that Policy T5 will have on the reduction of GHG emissions is dependent on the weighting given to the carbon elements compared to others, such as financial value. However, by assessing and prioritising proposals that positively contribute towards net-zero carbon targets and wider sustainability outcomes will likely help reduce GHG emissions overall. Although not specifically mentioned in the policy, vulnerability and resilience to climate change may come under the 'wider sustainability outcomes. As climate change poses a risk to assets and investment, consideration could be given to proposals when assessing the financial value for money. The GHG emissions reductions are dependent on the nature of the science and technologies being trialled for the sector but it is assumed that there will be a focus on ones that will help decarbonisation in line with the EEH Decarbonisation Strategy. Enabling a faster progression for innovation in the transport sector has the potential to help in the journey towards decarbonisation, by reducing GHG emissions. Whilst the materials used will have embodied carbon emissions and the trialling process will likely increase GHG emissions in the short term, it is likely that when these technologies are applied at scale, they will have the overall effect of reducing GHG emissions. Enabling innovation in the transport sector to progress quicker has the potential to help improve technologies and approach to deal with resilience to climate change.

Soil, Land Use, Resource and Waste: The preference towards non-motorised modes may result in less intensive developments, with less resources and lower levels of waste generation. There is also the potential for developments coming forward to make best use of repurposing existing infrastructure, which could result in significant positive effects on soil and land use, as it would result in the use of existing land take whilst protecting greenfield land and high-quality agricultural land. It is not clear what sort of proposals may come forward as a result of Policies T5 and T6 and the potential implications for soils, land use and waste. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials.

Noise and Vibration: The prioritisation of non-motorised modes and the potential additions of new walkways and cycleways would help encourage a modal shift, leading to reductions in noise pollution from the transport network. This is likely to have additional benefits on health wellbeing, biodiversity, natural capital and ecosystem services. Policy T5 aims to prioritise schemes that support net-zero, which has the potential to provide co-benefits through reduced noise pollution. Advancements in technology have the potential to improve noise pollution, for example, traffic management measures (such as speed cameras, and smart phone apps to alert road users where there is traffic on the road so they can avoid those route) to reduce congestion on the network can reduce idling cars, and therefore improve local noise pollution. Additionally, development of electric vehicles and trains (which could come forward as a result of both Policies T5 and T6) will result in a reduction in noise from the transport network.

Table 3-3 – Delivering East West Rail

Policy Theme: Delivering East West Rail	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T7 SA Score:	+	++	+	+	-	-	- -	-	- -	++	+	- -	-/+
T8 SA Score:	+	++	+	?	?	?	?	?	?	0	-/+	?	?
T9 SA Score:	+	++	+	0	0	0	0	0	0	?	-/+	?	?
T10 SA Score:	+	++	+	?	-	-	-	-	-	++	+	+	-/+
T11 SA Score:	+	++	0	+	-	-	-	-	-	++	-/+	-	-/+

T7 We support the delivery of the East West Rail project (including its Eastern Section), with the expectation that Phase 2 of the Western Section is open from Oxford – Bedford by 2024, Aylesbury – Milton Keynes by 2025 and the Central Section by 2030

T8 We will work with Network Rail and the East West Railway Company to prioritise delivery of East West Rail as a digitally connected corridor

Population and Equalities: East West Rail development will improve connectivity across the whole region, having a positive impact on the populations living across the EEH region (Policy T7). Investments in local improvements will also benefit the wider population, perhaps in more rural areas (Policy T11). The improvement in public transport has the potential to encourage individuals to make a shift from private car use to public transport. Having a digitally connected transport network will also benefit users but may not have as many benefits to some users as it may require access to and knowledge of how to use smart phones and other devices. Those elderly members of the population and/or those lower income groups without access to smart devices, may not benefit so greatly from this policy. Digital divides could inhibit the widespread implementation of robust and reliable digital transport networks. New transport network may also be more expensive, which could create a financial barrier. It is not however, clear if these policies will be proportionate and support all vulnerable groups within the region, this will depend upon the schemes themselves to ensure this objective is met. This could include mitigation that incorporates design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments.

Economy: New railway lines may contribute to and enhance wider and long term economic prosperity by facilitating the building of a strong, low carbon economy, by providing reliable and affordable transport choice to support growth. Local and regional economic centres would benefit from increases in rail passenger numbers and more reliable rails services achieved though upgrades to stations and improved signalling. Access to employment centres could be enhanced through improvements to rail services as well, encouraging continued economic growth. Greater connectivity and capacity across the region may also help to facilitate increased tourism opportunities, contributing further to the Region's economy.

Health: Improvements to transport connectivity has the potential to have a positive effect on both physical and mental health of individuals through the reduction of congestion and travel times, (thus potentially reducing stress levels (Policy T7 and T8) as well as greater access to services, facilities, recreation and open space. Improvement to public transport can also enable a shift from private car use to public transport, which can contribute to a reduction in carbon emissions, result in less road traffic collisions making the roads safer and improving air quality. However, new railway lines may increase impact of noise and air quality which can have a negative impact on health (Policy T7). A digitally connected network can reduce stress levels through supplying up to date travel information regarding delays and cancellation (Policy T8). Having a digitally connected transport network will also benefit users but may not have as many benefits to some users as it may require access to and knowledge of how to use smart phones and other devices. Those elderly members of the population and/or those lower income groups without access to a smart device, may not benefit so greatly from this policy. Digital divides could inhibit the widespread implementation of robust and reliable digital transport networks. New transport network may also be more expensive, which could create a financial barrier.

Community Safety: Given that the highest number of fatalities on the EEH's roads occur on rural roads, all policies could have positive effects on community safety. The delivery of East West Rail will improve connectivity across the EEH Region. This project could result in higher demand for public transport, with a knock-on reduction of the number of cars on the region's roads. Reduced vehicle numbers are likely to help reduce overall levels of congestion and subsequently the number of accidents and near misses. The delivery of a digitally connected corridor (Policy T9) could provide opportunities to transform how the railway is operated and deliver a greater reliability for railway passengers, helping to improve overall safety. However, the deployment of a Digital Service is currently constrained by availability of connectivity channels and may not be suitable within rural areas. A switch to digital may pose additional security risks, through targeted attacks on control systems and hacking of data. The establishment of regionally significant transport hubs (Policy T10) could result in upgrades to existing stations, which could incorporate enhanced safety measures. Those stations in more rural or isolated areas or areas of high crime (including Bedford, Oxford, Bletchley and Milton Keynes), crime and the fear of crime could increase.

Biodiversity: Upgrades are likely to occur within rail land, with limited ecological value. Only small-scale land take is likely to be required for upgrades which is unlikely to affect existing biodiversity. Small scale loss of habitat may occur, but upgrade proposals could be used to enhance the biodiversity value off-site and potentially provide opportunities achieve biodiversity net gain (Policy T7, T10 and T11). The scale (length) and linear nature of new railways lines, likely to occur through green areas and farmland has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystems. Although mitigation and enhancements are likely to be proposed, it may take several years before new planting and species use new habitats provided. It should however be noted that East West Rail has committed to biodiversity net gain, which has potential to contribute positively to the region's biodiversity and could ensure adequate biodiversity compensation. If other projects coming forward as a result of these policies, also

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T7 SA Score:	+	++	+	+	-	-	- -	-	- -	++	+	- -	-/+
T8 SA Score:	+	++	+	?	?	?	?	?	?	0	-/+	?	?
T9 SA Score:	+	++	+	0	0	0	0	0	0	?	-/+	?	?
T10 SA Score:	+	++	+	?	-	-	-	-	-	++	+	+	-/+
T11 SA Score:	+	++	0	+	-	-	-	-	-	++	-/+	-	-/+

T9 We will work with the East West Railway Company and Network Rail to identify opportunities to realise the longer-term potential of the East West Rail corridor in support of the economic potential of the region	commit to this there is potential for these policies to have a more positive effects on biodiversity. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' would entail (e.g. mobile phone masts), therefore, at this stage Policy T8 has resulted in uncertainties for biodiversity. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit biodiversity such as climate change, natural capital, air pollution etc. **Natural Capital and Ecosystem Services:** Policy T7 is likely to have negative impacts on natural capital as new railway sections are likely to replace natural land-use types. This could result in the loss of vegetation and soil carbon, for example - particularly if ancient woodland is affected which store high amounts of carbon. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' would entail (e.g. mobile phone masts), therefore, at this stage Policy T8 has resulted in uncertainties for natural capital and ecosystem services. The impact of Policy T9 is uncertain but could have negative effects on natural capital if land-use change to natural habitats are required. Policy T10 could have either negative or positive effects - this depends on the design of transport hubs. If natural capital is enhanced at these hubs, then there is a potential to increase the delivery of ecosystem services. East West Rail has committed to biodiversity net gain, which has potential to contribute positively to the region's natural capital and subsequent ecosystem services. If other projects coming forward also commit to this there is potential for these policies to have a more positive effects on natural capital and ecosystem services. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit natural capital such as climate change, biodiversity net gain, air pollution etc. **Landscape and Townscape:** The introduction of new railway lines can result in less cars on the road, reducing noise and air quality impact, which can have a beneficial impact on Landscapes and Townscapes. However, landscapes and tranquillity are under pressure from development throughout the region, and new linear features such as railway lines can have negative impacts on landscape setting, especially for AONB's and more rural parts of the region. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' (Policy T8) would entail (e.g. mobile phone masts), therefore, at this stage the policy has resulted in uncertainty. All policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit landscape and townscapes such as climate change, natural capital, air pollution etc.
T10 We will work with partners, the East West Railway Company and Network Rail to ensure that where the East West Rail corridor intersects existing main lines the opportunity is take to establish regionally significant transport hubs: priority will be given to developing proposals in the following locations: • Oxford Stations • Bicester Stations • Aylesbury Station • Bletchley/Milton Keynes • Bedford Midland Station • East West Rail/East Coast Main Line • Cambridge/Cambridge South Stations	**Historic Environment:** Upgrading of stations could provide an opportunity to restore/conserve historic assets that are currently in poor conditions or at risk and could present an opportunity to enhance the historic environment particularly in the setting of heritage features through improved design and landscaping. However, there is also likely to be a negative impact on heritage assets; new facilities may also erode the townscape character and the setting of built heritage and there may be a particular impact on, buried archaeology, historic landscapes and a potential impact on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' (Policy T8) would entail (e.g. mobile phone masts), therefore, at this stage the policy has resulted in uncertainty. All policies have potential to increase connectivity across the region which could result in more people being access, explore and gain understanding of the region's unique historic environment. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit the historic environment such as climate change and air pollution etc. **Water Environment:** The EEH region has a wide range of Flood Zones, Drinking Water Protection Zones and water courses (including Main Rivers) within the EEH region, therefore, any development may negatively impact on these receptors and areas. As such, the completion of the East West Rail scheme is likely to result in modifications and discharges to watercourses. (Policy T7, T10 and T11). It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' (Policy T2) would entail (e.g. mobile phone masts), therefore, at this stage the policy has resulted in uncertainty. The development of scheme in both policies T7 and T8 could result in increased land take and the introduction of hard impermeable surfaces, which could increase the levels of flooding. . Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit the water environment such as climate change, natural capital, air pollution etc. **Air Quality:** Upgrades will improve the station facilities and enhance rail users' experience which could increase the uptake of journeys by rail and as a result reduce car journeys which would have a beneficial effect by reducing transport related emissions, thus improving air quality. This is likely to have additional benefits on health and wellbeing, natural capital, biodiversity

Policy Theme: Delivering East West Rail	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T7 SA Score:	+	++	+	+	-	-	- -	-	- -	++	+	- -	-/+
T8 SA Score:	+	++	+	?	?	?	?	?	?	0	-/+	?	?
T9 SA Score:	+	++	+	0	0	0	0	0	0	?	-/+	?	?
T10 SA Score:	+	++	+	?	-	-	-	-	-	++	+	+	-/+
T11 SA Score:	+	++	0	+	-	-	-	-	-	++	-/+	-	-/+
T11 We will work with partners to prioritise investment in improved local connectivity connecting East West Rail stations with their local communities	and landscape. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit air quality, such as climate change, greenhouse gases, air pollution etc. **Climate Change and Greenhouse gases:** The delivery of the East West Rail project will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and operation of the project. However, the improvement of the rail network, particularly if it includes electrification of the rolling stock, could reduce GHG emissions over the operational lifecycle by reducing the GHG emissions from other transport modes and encouraging a modal shift towards public transport. The vulnerability of the East West Rail project would depend on whether the route is in vulnerable areas, the resilience of the design, the materials used and the maintenance of the project to ensure they can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The economic growth in a region or area is likely to bring more people and require an increase in the built environment (e.g. offices, housing and retail facilities). The development and operation of the built environment will likely increase GHG emissions through the large quantities of carbon associated with the construction and maintenance of the corridor. It is likely that the climate will generally have negative effects on the operation of the project. With future trends on climate change predicting more extreme climatic conditions, it is likely that the operation of the project will be impacted more in the future unless designed for and managed properly. The delivery of East West Rail as a digitally connected corridor will likely increase the GHG emissions through the associated embodied carbon in construction and maintenance, and an increase in energy use in operation. However, investment in digital infrastructure to support this connectivity and support the lower emitting carbon travel modes in the user hierarchy will likely reduce GHG emissions. Establishing regionally significant transport hubs along the East West Rail corridor will likely improve the connectivity and service of the rail network in the region. This could increase the GHG emissions from the network operation but also encourage a modal shift and potentially reduce the GHG emissions from other more carbon intensive transport modes. **Soil, Land Use, Resource and Waste:** It is unlikely that upgrades to stations would cause negative effects on best and most versatile soils on agricultural land as works would likely be in railway land. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of East West Rail will result in the loss of land, including 'Best and Most Versatile' agricultural land. Policy T10 could result in the use of existing infrastructure, which could result in the use of less materials, reduced waste and the preservation of land. Policies T7 and T11 are likely to result in larger scale construction, comprising use of natural resources and generation of waste. It is not clear the level infrastructure needed, the potential land take and the level of resource that would be required in order to deliver a 'digitally connected corridor' (Policy T8) would entail (e.g. mobile phone masts), therefore, at this stage the policy has resulted in uncertainty. . Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit soil, land use, resource and waste, such as repurposing existing infrastructure and focusing on existing routes. **Noise and Vibration:** Efficient rail travel has the potential to reduce noise pollution through the reduction in traffic noise and easement of congestion. However, there is the potential at certain locations to increase noise levels, where new rail routes are introduced, this is particularly so during construction. East West Rail will be electrified, replacing traditional diesel trains with electric stock. As electrification progresses across the EEH region, it will help contributes to reducing noise at source. There is potential that an increase in electricity required to supply and charge an electrified network could have associated noise impacts. Policy T9 focuses on the longer-term potential of the East West Rail corridor, this has resulted in uncertainty at this stage, however, there could be potential that this could focus on attributes that could benefit noise and vibration, such as delivering fully electrified rail networks.												

Table 3-4 – Developing Other East West Arcs

Policy Theme: Developing Other East West Arcs	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T12 SA Score:	+	++	+	+	- -	- -	-/+	-	-/+	+	-/+	- -	?
T13 SA Score:	+	++	+	+	?	?	-/+	?	-/+	+	-/+	?	?
T12 We will prioritise improvements to east west rail connectivity to support economic activity and in support of planned housing growth, including: ▪ A northern arc connecting north Oxfordshire, Northamptonshire and Peterborough ▪ A southern arc connecting central Buckinghamshire, southern Hertfordshire and Cambridgeshire	**Population and Equalities:** The delivery of East West Rail connectivity improvements, and the development of options between the region and the SW of England and Wales, is likely to have positive effects on the populations living in the Heartland. As per the sustainability objective, East West Rail and other rail developments could help to increase the capacity, connectivity and efficiency of the transportation network to support future population increases. Greater connectivity will help those living in more rural communities gain greater access to jobs, services and facilities. It's not clear whether both policies will ensure inclusivity and support those more deprived communities, which will depend on the projects coming forward as a result of this policy. Mitigation could ensure that new rail scheme include fair pricing, include design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and/or include audio visual requirements of those with sight loss or hearing impairments. These measures could ensure a more inclusive transport network. **Economy:** Both policies will help to provide a better-connected region, both internally and externally, bringing more people into the region and helping those within the region gain better access to jobs and services. Policy T12 is focused on supporting planned housing growth which is likely to have significant positive effects on the economy. By aligning housing growth and sustainable transport, the region will be better able to meet the mobility needs of the population, support future growth and whilst creating economically prosperous places for people to live and work. The development of a new routes brings with the potential for positive development. Both policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Health**: Both policies will help to increase further connectivity across the region and beyond. Access to activities provides the potentiality for people to participate in education, work, social, leisure, cultural, etc. opportunities which in turn contribute to overall health and wellbeing. New railway lines may result in increased noise and air pollution for receptors close to the routes, however the overall effect of rail on air quality and public health is considerably lower than roads. From these policies it is not clear as to whether improved connectivity will include those more rural communities within the region. Connectivity to rural communities should be considered to improve connectivity to open spaces. **Community Safety:** The delivery of improvements to East West Rail (as per Policy T12) and the development of options between the region and the SW of England and Wales, will improve connectivity across the EEH Region. This project could result in higher demand for public transport, with a knock-on reduction of the number of cars on the region's roads. Reduced levels of traffic are likely to help reduce overall levels of congestion and subsequently the number of road traffic collisions and near misses. It is not clear as to whether the additional southern and northern arcs will be electrified, which has the potential to bring about additional safety concerns - whilst there is no danger to people using the railway correctly, there may be a risk for nearby land users such as farmers and anglers. **Biodiversity:** Although the policy does not support the sustainability objective directly, decreases in CO2 emissions from decarbonisation may indirectly benefit the biodiversity in the region. However, the proposals for the delivery of additional East West arcs and the development of options between the region and the SW of England and Wales, could result in the disturbance and loss of biodiversity as part of their construction and operation (e.g. noise pollution, loss of habitats etc.). It should however be noted that East West Rail has committed to biodiversity net gain, but it is not clear at this stage, if proposals coming out of these policies will also endeavour to do the same. If they do, there is potential for more positive effects on biodiversity. It is not clear on the types of proposals that might come forward as a result of Policy T13 (these could be rail, road, buses etc.) and how detrimental they will be on biodiversity; however, it is assumed that both policies could result in substantial land take. The scale (length) and linear nature of new railways lines, has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. **Natural Capital and Ecosystem Services:** The introduction of new railway lines is likely to impact negatively on natural capital and the ecosystem services it provides. Impacts could be mitigated by avoiding particularly valuable natural capital assets such as ancient woodlands and if natural capital is enhanced elsewhere or by taking a natural capital approach to decision making in design, mitigation. It should however be noted that East West Rail has committed to biodiversity net gain, but it is not clear at this stage, if proposals coming out of these policies will also endeavour to do the same. If they do, there is potential for more positive effects on natural capital and ecosystem services. It is not clear on the types of proposals that might come forward as a result of Policy T13 (these could be rail, road, buses etc.) and how detrimental they will be on biodiversity; however, it is assumed that both policies could result in substantial land take. The scale (length) and linear nature of new railways lines, has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. **Landscape and Townscape**: New rail-lines are likely to have some both direct and indirect negative effects on designated landscapes, in addition to landscape quality outside these designations, by introducing new linear features into the landscape. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. The development of a new routes brings with the potential for positive development. Both policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy.												

Policy Theme: Developing Other East West Arcs	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T12 SA Score:	+	++	+	+	- -	- -	-/+	-	-/+	+	-/+	- -	?
T13 SA Score:	+	++	+	+	?	?	-/+	?	-/+	+	-/+	?	?
T14 We will work with Western Gateway and Network Rail to develop proposals that strengthen connectivity between Swindon/Oxford and the South-West and South Wales in support of economic activity and planned growth	**Historic Environment:** Policy T12 is likely to have a negative impact on heritage assets, such as buried archaeology, and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact, which can detract from heritage assets and their unique setting, if designed inappropriately. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. Providing greater connectivity may allow heritage asset to become more accessible, presenting potential tourism opportunities. **Water Environment:** The completion of the East West Rail scheme is likely to result in modifications and discharges to watercourses, negatively affecting the water environment. Proposals as part of T13 aren't clear but could also negatively affect the water environment through large land take. Both policies could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. There could, however, be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. Both polices could help the region contribute less to climate change, through the reduction to CO2 emissions, which indirectly could reduce the risk of flooding, as per the sustainability objective. **Air Quality:** A reduction in road traffic volumes if more journeys and freight movements are made by rail could reduce air quality emissions of the overall transport network. Greater connectivity across the region will remove the need for rail users to transit through London, and additionally provide some relief to rail services on the radial main lines to/from the capital. This is likely to reduce emissions from transport and a subsequent improvement in air quality. This is likely to have additional beneficial effects on health and wellbeing, biodiversity natural capital and ecosystem services. It is not clear as to whether the additional southern and northern and proposals as part of Policy T13 will be electrified, which could have additional benefits for air quality. **Climate Change and Greenhouse gases:** Any development or construction needed to support economic activity and planned housing growth will result in an increase in GHG emissions through the carbon associated with the construction and maintenance of the corridor. Also, there will likely be an increase in the operational GHG emissions due to the increase in the number of journeys to support the economic activities in this area. Increased economic activity is likely to bring more people to an area and require appropriate built environment (e.g. offices, housing and retail facilities). The development and operation of the built environment will likely increase GHG emissions. Supporting and enabling housing development will also result in an increase in GHG emissions through the large quantities of embodied carbon and carbon associated with the construction and use of the houses. However, the improvement of the rail network, particularly if it includes electrification of the rolling stock, could reduce GHG emissions over the operational lifecycle by encouraging a modal shift and reducing the GHG emissions from other more carbon intensive transport modes. It is likely that this policy will result in a combination of both positive and negative impacts on GHG emissions. The vulnerability of the connectivity of East West Rail with other transport networks would depend on whether the route is on within areas particularly vulnerable to climate change, the resilience of the design, the materials used and the maintenance of the project to ensure they can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). It is likely that the climate will generally have negative effects on the operation of the project. With future trends on climate change predicting more extreme climatic conditions, it is likely that the operation of the project will be impacted more in the future unless designed for and managed properly. **Soil, Land Use, Resource and Waste:** Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new routes, could result in the loss of land, including 'Best and Most Versatile' agricultural land and damage soils adjacent to the rail line. It is not clear on the types of proposals that might come forward as a result of Policy T13 (these could be rail, road, buses etc.) however, both policies could result in larger scale construction, comprising use of natural resources and generation of waste. **Noise and Vibration:** There is potential at certain locations to for an increase noise levels beyond statutory limits, if additional east-west routes were to be developed and new stations provided. It is not clear as to whether both policies will result in electrified routes like East West Rail, however if they are, there could be additional benefits for noise pollution.												

Table 3-5 – Improving North-South Connectivity

Policy Theme: Improving North-South Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T14 SA Score:	?	++	?	?	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T15 SA Score:	+	++	+	+	?	?	?	?	-/+	++	+	?	?
T16 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T17 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T18 SA Score:	+	++	+	+	?	?	-/+	?	-/+	-/+	-	-/+	?
T14 We will work with Government, Network Rail, Highways England and Oxfordshire County Council to develop a long term solution to challenges on the Didcot – Oxford – Bicester/Banbury corridor	**Population and Equalities:** All policies will help to improve connectivity across the region, having a positive impact on the populations within the EEH region. Increased transport options will help to increase the capacity, connectivity and efficiency of the transportation network to support future demographic changes. Greater connectivity will help those living in more rural communities gain greater access to jobs, services and facilities. It's not clear whether policies will ensure inclusivity and support those more deprived communities, which will depend on the projects coming forward as a result of this policy. Mitigation could ensure that new rail scheme include fair pricing, include design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and/or include audio visual requirements of those with sight loss or hearing impairments. At this stage Policy T14 has resulted in uncertainties and is reliant upon the findings from the Oxfordshire Rail Corridor Study. However, policy preamble has eluded to the challenges of supporting the economic opportunities within Oxfordshire and enabling strategic movements. Solutions could therefore be beneficial to population and equalities through increase employment opportunities and increased connectivity. **Economy:** Although there are some uncertainties regarding long term solutions and the findings of the Oxfordshire Rail Corridor Study, the policy preamble has eluded to the challenges of supporting the economic opportunities within Oxfordshire and enabling strategic movements. Solutions could therefore be beneficial to the economy through increase employment opportunities, connectivity and supporting economic growth. All other policies support economic growth through improved connectivity, reliability and journey experience as a result of network improvements. Improving the connectivity between economic hubs will help to create economically prosperous places for people to live and work. The development of a new and improved routes brings with the potential for positive development. Policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Health:** All policies will result in greater connectivity, which is likely to provide greater access to jobs, services, recreation and open spaces, which all have beneficial effects on both physical and mental health. Access to employment can have beneficial effects on health and wellbeing across people's lives and protects against social exclusion. Investment into public transport, will reduce reliance on the private car, with the potential to reduce GHG emissions and air pollution, which has health benefits on the EEH populations. At this stage Policy T14 has resulted in uncertainties and is reliant upon the findings from the Oxfordshire Rail Corridor Study. However, policy preamble has eluded to the challenges of supporting the economic opportunities within Oxfordshire and enabling strategic movements. Solutions could therefore be beneficial to health through increase employment opportunities and increased connectivity. **Community Safety:** Improved public transport connectivity may provide a viable journey alternative, particularly to those living in more rural locations, where there is a high reliance upon cars and other private modes. There's potential that the policy could result in a reduction in the number of cars on the road, which is likely to help reduce levels of congestion and accidents and near misses (involving cars, and non-motorised users). At this stage Policy T14 has resulted in uncertainties and is reliant upon the findings from the Oxfordshire Rail Corridor Study. However, policy preamble has eluded to the challenges of enabling strategic movements. Solutions could therefore be beneficial to community safety through better increased connectivity. The challenges faced on the A1 corridor (Policy T18) are not clear from the policy, however, it has been assumed that these could include reductions in congestion, improved safety and connectivity. **Biodiversity:** Public transport based solutions can reduce the need for private car travel and improve air quality and noise pollution, which in turn would benefit biodiversity across the region. However, highways and rail developments can have negative impacts on biodiversity, in terms of habitat loss, fragmentation and noise impacts, particularly during construction. The exact scale and types of developments and proposals as part of these policies are unknown and the extent of effects on biodiversity are unknown, however, all proposals have the potential to deliver biodiversity net-gain. Large railway or road developments have the potential to result in large land take, whilst some smaller footpaths and cycleway schemes could be less significant or even incorporate planting and green space to encourage biodiversity. According to the A1 East of England Strategic Study: Stage 3
T15 We will work with Network Rail, Government and adjoining Sub-national Transport Bodies to maximise the allocation of released capacity on the classic network as a result of HS2 to benefit connectivity within the region.													
T16 We will work with Government, Network Rail, and partners to develop a solution that improves connectivity on the Luton – Bedford – Wellingborough corridor													

Policy Theme: Improving North-South Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T14 SA Score:	?	++	?	?	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T15 SA Score:	+	++	+	+	?	?	?	?	-/+	++	+	?	?
T16 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T17 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T18 SA Score:	+	++	+	+	?	?	-/+	?	-/+	-/+	-	-/+	?

T17 We will work with Cambridge and Peterborough Combined Authority, Cambridgeshire County Council and Peterborough City Council alongside Network Rail and Government to support the priorities identified in the Cambridge Corridor Study	Report, poor air quality and noise have been identified as key environmental issues, which particularly affects the biodiversity in the area. If Policy T18 addresses this issue as part of one of the 'key challenges' there is potential for positive effects. However, a focus on issues such as congestion and connectivity, could result in an increase in more cars on the roads, which will have negative implications on biodiversity. **Natural Capital and Ecosystem Services:** The introduction of new transport infrastructure is likely to impact negatively on natural capital and the ecosystem services it provides. Impacts could be mitigated by avoiding particularly valuable natural capital assets such as ancient woodlands and if natural capital is enhanced elsewhere or by taking a natural capital approach to decision making in design, mitigation. The exact scale and types of developments and proposals as part of these policies are unknown and the extent of effects on natural capital and ecosystem services are unknown, however, all proposals have the potential to deliver biodiversity net-gain. Large railways or road developments have the potential to result in large land take, whilst some smaller footpaths and cycleway schemes could be less significant or even incorporate planting and green space which could increase the region's natural capital stock. According to the A1 East of England Strategic Study: Stage 3 Report, poor air quality and noise have been identified as key environmental issues, which particularly affects the biodiversity in the area. If Policy T18 addresses this issue as part of one of the 'key challenges' there is potential for positive effects. However, a focus on issues such as congestion and connectivity, could result in an increase in more cars on the roads, which will have negative implications on natural capital and ecosystem services.
T18 We will work with partners, including Government and Highways England to develop a long term solution to the challenges of the A1 (East of England) corridor.	**Landscape and Townscape:** Landscapes and tranquillity are under pressure from development throughout the region. Development in rail (Policy T15) can have negative impacts on the setting of landscapes, but can also reduce cars on the road, where increased noise can have negative impacts on landscape features, especially if development were to take place in AONB's. Public transport enhancements can take cars off the road, reducing congestion and having a potential benefit on the tranquillity of the region; however, new transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. Investment in the road network may result in opportunities to improve both landscape and setting of existing roads, but in general new highways have a negative impact on landscape and tranquillity. All policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. The development of a new routes brings with the potential for positive development. Policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Historic Environment:** There is likely to be a negative impact on heritage assets from new roads and railways, particularly on buried archaeology and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. An increase in public transport modes can have positive impacts through reducing cars in city centres, and improving the local air quality, which can have positive impacts on heritage assets. The exception to this is Policy T18 which could maintain or increase levels of traffic through the A1 corridor. All policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique historic environment. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. According to the A1 East of England Strategic Study: Stage 3 Report identifies that the A1 negativity impacts on the setting of heritage assets through visual or noise disturbances. If Policy T18 addresses this issue as one of the 'key challenges' there is potential for positive effects. **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, new roads and railways to improve connectivity across the region are likely to result in modifications and discharges to watercourses. Policies could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. There could, however, be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. Polices could help the region contribute less to climate change, through the reduction to CO2 emissions, which indirectly could reduce the risk of flooding, as per the sustainability objective. **Air Quality:** A reduction of cars on the road through public transport will have positive impacts on air quality across the region from reduced congestion. Reductions in air pollutants through a modal shift from road to rail would also have beneficial effect. Depending on the proposal brought forward Policy T18 improve highway networks, there could be a positive impact on air quality on reduced cars on the network, or a negative impact as improvements to the road network generally encourages more people to use the network, contributing to increased emissions. **Climate Change and Greenhouse gases:** Solutions to develop new or on existing rail and road infrastructure to reduce the pressure on the Didcot – Oxford – Bicester/Banbury, Cambridge and Peterborough and the Luton – Bedford – Wellingborough/Kettering corridors (Policies T14, 16 and 17) will result in an increase in GHG emissions through the large

Policy Theme: Improving North-South Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T14 SA Score:	?	++	?	?	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T15 SA Score:	+	++	+	+	?	?	?	?	-/+	++	+	?	?
T16 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T17 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T18 SA Score:	+	++	+	+	?	?	-/+	?	-/+	-/+	-	-/+	?

quantities of carbon associated with the construction, maintenance and from the operational use of the transport systems (road users and rail fleet). Development in the road network is likely enable greater capacity therefore, allowing for more road users, increasing GHG emissions from vehicles. However, through improving the road network, levels of congestion may decrease which would reduce GHG emissions from vehicles. There will also likely be an increase in the operational GHG emissions in increasing the number of journeys on the rail network. However, the improvement of the rail network, particularly if it includes electrification of the rolling stock, could reduce GHG emissions over the operational lifecycle by encouraging a modal shift towards public transport use, thereby reducing the GHG emissions from other more carbon intensive transport modes. Although the construction of any developments would result in an increase in GHG emissions, the potential significance for a modal shift towards public transport would provide a decrease in GHG emissions. Reallocating capacity of the classic network as a result of HS2 (Policy T15) will likely reduce pressures on certain sections of the rail network and improve the level service. This will also improve the connectivity of communicates within the region. As this would potentially need little development and would not necessarily increase the number of journeys on the rail network, this will likely reduce GHG emissions. Solutions to develop new or on existing road infrastructure (Policy T18) will result in an increase in GHG emissions through the carbon and carbon associated with the construction, maintenance and from the operational use of the transport systems (road users). Development in the road network is likely enable greater capacity and, therefore, will allow for more road users, increasing GHG emissions from vehicles. However, through improving the road network, levels of congestion may decrease which would reduce GHG emissions from vehicles. The vulnerability of the investments and solutions to improve intra and inter regional journeys would depend on whether the existing/new infrastructure within areas particularly vulnerable to climate change, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly.

Soil, Land Use, Resource and Waste: Any new road or rail development will result in the use of raw materials. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. It is not clear on the scale of development, level infrastructure and the land take of schemes that come forward as a result of these policies, but opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new routes, could result in the loss of land, including ‘Best and Most Versatile’ agricultural land.

Noise and Vibration: The addition of new PRoWs in unlikely to contribute heavily to noise pollution, however, a new rail route will be significant. An increase in public transport will have positive impact on noise, through the reduction of cars on the road, however, improvements to the road network may encourage people to drive, however, having a negative impact on noise pollution (Policy T18). According to the A1 East of England Strategic Study: Stage 3 Report identifies that noise disturbances as a key issue. If Policy T18 addresses this issue as one of the 'key challenges' there is potential for positive effects on noise pollution. There is potential at certain locations to for an increase noise levels beyond statutory limits, if additional north-south rail routes were to be developed and new stations provided. It is not clear as to whether policies will result in electrified routes like East West Rail, however if they are, there could be additional benefits for noise pollution. The impact of the policies is highly dependent upon the proposals coming forward.

Table 3-6 - Transforming Intra and Inter Regional Journeys

Policy Theme: Transforming Intra and Inter Regional Journeys	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T19 SA Score:	+	++	+	+	-	-	-/+	-/+	-/+	++	+	-/+	?
T20 SA Score:	+	++	+	?	?	?	?	?	?	+	-	-/+	?
T21 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	- -	- -	+	-
T22 SA Score:	+	++	+	+	-	-	-/+	-/+	?	++	-/+	-/+	-/+
T19 We will prioritise investment in the development of public transport-based solutions when improving intra-regional connectivity between Regionally Significant Hubs, Areas of Economic Opportunity and Areas of Significant Change	**Population and Equalities:** All policies will help to improve connectivity across the region, having a positive impact on the populations within the EEH region. Increased connectivity will allow increased access to key economic hubs, where there are more jobs available. The use of digital infrastructure in Policy T20, may non benefit all of the community, as it may require access to and knowledge of how to use smart phones and other devices. Those elderly members of the population and/or those lower income groups without access to smart devices, may not benefit so greatly from this policy. Digital divides could inhibit the widespread implementation of robust and reliable digital transport networks. Investment in the road network (Policy T21) will benefit communities in providing connectivity between new employment hubs, and potentially provide other modes of transport such as cycling by improving the existing infrastructure. For maximum benefit, investment should include in road assets in rural communities, to benefit the wider population within the region. The policy will not benefit carless households. **Economy:** All policies support economic growth through improved connectivity, reliability and journey experience as a result of network improvements. Improving the connectivity between economic hubs will also improve economic prosperity across the region (Policies T19 and T22). A digitally enabled corridor can also provide research jobs (Policy T20). The extent of this growth will be context specific, it will be dependent on the current economic landscape, the economic centres served, and the scale of the intervention proposed. Improvements in the road network (Policy T21 and T22) could include opportunities for embedding cycling routes within the design, which could present additional tourism opportunities across the region, however, this is dependent on the types of development brought forward. **Health:** None of these policies specify an improvement in the network which will support more active travel modes. However, improvements in the road network (Policy T21 and T22) could include opportunities for embedding cycling routes within the design, although this is dependent on the types of development brought forward. All policies will result in greater connectivity, which is likely to provide greater access to jobs, services, recreation and open spaces, which all have beneficial effects on both physical and mental health. Policy T19 will provide investment in public transport, which will reduce reliance on the private car, with the potential to reduce GHG emissions, which has health benefits on the EEH populations. Additionally, a focus on public transport can reduce air pollution. Innovative digital solutions can be implemented to improve the efficiency of cars, including traffic management measures to reduce congestion and the development of electric cars and bikes, which will both improve air quality, having a positive impact on health (Policy T21). **Community Safety:** Improved public transport connectivity may provide a viable journey alternative, particularly to those living in more rural locations, where there is a high reliance upon cars and other private modes. There's potential that the policy could result in a reduction in the number of cars on the road, which is likely to help reduce levels of congestion and accidents and near misses (involving cars, and non-motorised users). The delivery of a digitally enabled corridor (Policy T20) could provide opportunities to transform how the railway is operated and deliver a greater reliability for railway passengers, helping to improve overall safety. However, the deployment of a Digital Service is currently constrained by availability of connectivity channels and may not be suitable within rural areas. A switch to digital may pose additional security risks, through targeted attacks on control systems and hacking of data. It is assumed that the protection and enhancement of the existing infrastructure assets (as per Policy T21) could lead to increased road safety measure. Given that in some parts of the region there are a higher than the national average number of road traffic accidents, highway improvements could improve road safety and therefore have a beneficial impact on community safety. **Biodiversity:** Public transport-based solutions (Policy T19 and T22) can reduce the need for private car travel and improve air quality and noise pollution, which in turn would benefit biodiversity across the region. However, highways and rail developments can have negative impacts on biodiversity, in terms of habitat loss, fragmentation and noise impacts, particularly during construction. The exact locations of developments and proposals as part of these are unknown and the extent of effects on biodiversity are unknown, however, all proposals have the potential to deliver biodiversity net-gain. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally enabled corridor' would entail (e.g. mobile phone masts), therefore, at this stage Policy T20 has resulted in uncertainties for biodiversity. **Natural Capital and Ecosystem Services:** The impacts on natural capital are likely to be insignificant if existing infrastructure is improved for public transport modes without impacting on habitats (Policy T19). However, where habitats are impacted directly - such as through the creation of new transport infrastructure there is likely to be an impact on natural capital and the ecosystem services provided. Impacts on natural capital could be mitigated or compensated for if natural capital assets elsewhere are improved or incorporated into the design of future projects. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally												
T20 To realise our decarbonisation commitments, while supporting economic growth, we will expect infrastructure investment is designed as digitally enabled corridors													

Policy Theme: Transforming Intra and Inter Regional Journeys	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T19 SA Score:	+	++	+	+	-	-	-/+	-/+	-/+	++	+	-/+	?
T20 SA Score:	+	++	+	?	?	?	?	?	?	+	-	-/+	?
T21 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	- -	- -	+	-
T22 SA Score:	+	++	+	+	-	-	-/+	-/+	?	++	-/+	-/+	-/+

T21 We will support investment in the Strategic Road Network and Major Road Network where this:
a) Protects and enhances the existing infrastructure asset
b) Delivers a solution to an identified problem on the existing infrastructure asset
c) Enables access to new economic opportunities and/or additional housing growth

T22 We will, working with Network Rail, Highways England and public transport operators, identify the level of service required between Regionally Significant Hubs, Areas of Economic Opportunity and Areas of Significant Change to achieve improved intra-regional connectivity: the levels of service will be reviewed on a bi-annual basis

enabled corridor' would entail (e.g. mobile phone masts), therefore, at this stage Policy T20 has resulted in uncertainties for natural capital and ecosystem services. Although policies T19 and T22 do not support the sustainability objective directly, decreases in CO2 emissions from increases in public transport usage may indirectly benefit the region's natural capital stock and the ecosystem services they provide.

Landscape and Townscape: Landscapes and tranquillity are under pressure from development throughout the region. Development in rail (Policy T19 and T22) can have negative impacts on the setting of landscapes, but can also reduce cars on the road, where increased noise can have negative impacts on landscape features, especially if development were to take place in AONB's. Public transport enhancements can take cars off the road, reducing congestion and having a potential benefit on the tranquillity of the region; however, new transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. Investment in the road network may result in opportunities to improve both landscape and setting of existing roads, but in general new highways have a negative impact on landscape and tranquillity. All policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally enabled corridor' would entail (e.g. mobile phone masts), therefore, at this stage the visual impact and subsequent effect on the landscape and townscape is uncertain. Mitigation could be applied to ensure that design is discrete and in keeping with the landscape and/or townscape.

Historic Environment: There is likely to be a negative impact on heritage assets from new roads and railways, particularly on buried archaeology and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. An increase in public transport modes can have positive impacts through reducing cars in city centres, and improving the local air quality, which can have positive impacts on heritage assets. All policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique historic environment. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally enabled corridor' would entail (e.g. mobile phone masts), therefore, at this stage the visual impact and subsequent effect on the historic environment is uncertain. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets.

Water Environment: The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, new roads and railways to improve connectivity across the region are likely to result in modifications and discharges to watercourses. Policies could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. There could however, be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. Both polices could help the region contribute less to climate change, through the reduction to CO2 emissions, which indirectly could reduce the risk of flooding, as per the sustainability objective. Policy T21 aims to protect and enhance existing infrastructure, it is assumed that this could include protection from flooding and climate change, making the road network more resilient to future changes. It is not clear the level infrastructure needed and the potential land take that would be required in order to deliver a 'digitally connected corridor' (Policy T20) would entail (e.g. mobile phone masts), therefore, at this stage the policy has resulted in uncertainty.

Air Quality: A reduction of cars on the road through public transport will have positive impacts on air quality across the region from reduced congestion. Air quality improvements through a modal shift from road to rail would have a beneficial effect on health and wellbeing, biodiversity, natural capital, historic environment, landscape and the water environment. Depending on the proposal brought forward under Policy T22 to improve highway networks, there could be a positive impact on air quality on reduced cars on the network, or a negative impact as improvements to the road network generally encourages more people to use the network, contributing to increased emissions (Policy T21). Digital infrastructure on roads (Policy T20) e.g. SMART motorways and traffic management measures has the potential to have a positive impact on air quality.

Climate Change and Greenhouse gases: Prioritising investment in the development of public transport-based solutions when improving intra-regional connectivity will improve the integration of these transport modes and the user uptake. This will likely help by encouraging a modal shift towards public transport, reducing GHG emissions. However, it is likely that there will be an increase in GHG emissions through the embodied carbon associated with the development and the operation of these solutions. However, this is likely to be minimal compared to the modal shift generated by investment into the development on public transport solutions. The vulnerability of the investments and solutions to improve intra and inter regional journeys would depend on whether the existing/new infrastructure within areas particularly vulnerable to climate change, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic

Policy Theme: Transforming Intra and Inter Regional Journeys	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T19 SA Score:	+	++	+	+	-	-	-/+	-/+	-/+	++	+	-/+	?
T20 SA Score:	+	++	+	?	?	?	?	?	?	+	-	-/+	?
T21 SA Score:	+	++	+	+	-/+	-/+	-/+	-/+	-/+	- -	- -	+	-
T22 SA Score:	+	++	+	+	-	-	-/+	-/+	?	++	-/+	-/+	-/+
	conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. The delivery of all new strategic infrastructure investment as a digitally enabled corridor will likely increase the GHG emissions through the associated embodied carbon in construction and maintenance, and an increase in energy use in operation. Investment in the Strategic Road Network and Major Road Network will result in an increase in GHG emissions through the carbon associated with the construction and, maintenance. It is also likely that this will result in an increase in GHG emissions with any additional emissions from the end users (traffic) once operational, unless investments enable the integration of electric, low carbon and/or zero carbon travel modes and from the end users (traffic) once operational. Protecting and enhancing existing infrastructure assets, particularly those with identified problems, will still result in an increase in GHG emissions but potentially less than if the focus was on new assets. Development in the road network is likely to enable greater capacity, therefore, allowing for more road users, increasing GHG emissions from vehicles. **Soil, Land Use, Resource and Waste:** Any new road or rail development will result in the use of raw materials. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal. It is not clear on the scale of development, level infrastructure and the land take of schemes that come forward as a result of these policies, but opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Policy T21 is also likely to help protect the region's best and most versatile land by avoiding new developments. **Noise and Vibration:** An increase in public transport (Policy T19 and T22) will have positive impact on noise, through the reduction of cars on the road. An improvement to the road network may encourage people to drive, however, having a negative impact on noise pollution (Policy T22). Digital technology can reduce congestion on the road, having a positive noise impact, however, the type of infrastructure needed to deliver a 'digital enabled' corridor is not currently known. If this is large in scale, there may be temporary noise impacts generated from construction. There is potential at regionally significant hubs to for an increase noise levels beyond statutory limits, if proposals that included rail schemes were to be developed. There is potential for policies to support electrified routes like East West Rail, which could help to reduce noise pollution.												

Table 3-7 – Transport Orientated Developments

Policy Theme: Transport Orientated Developments	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T23 SA Score:	+	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T24 SA Score:	+	++	+	++	- -	- -	-	-	-/+	+	+	-	-/+
T23 We will work with local planning authorities and local enterprise partnerships to use the opportunities created by investment in strategic transport infrastructure and services to shape the location of future economic and housing growth proposals. We will work with partners to ensure integration of travel modes and local connectivity are integral components of any such proposals	**Population and Equalities:** Both policies aim to provide greater connectivity, which is likely to have positive effects on the populations living in the Heartland. As per the sustainability objective, transport developments could help to increase the capacity, connectivity and efficiency of the transportation network to support future demographic changes. Greater connectivity will help those living in more rural communities gain greater access to jobs, services and facilities. It's not clear whether both policies will ensure inclusivity and support those more deprived communities, which will depend on the projects coming forward as a result of this policy. However, mitigation could ensure that new transport developments include fair pricing, design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and/or include audio visual requirements of those with sight loss or hearing impairments. Development will need to ensure that they are accessible to all groups to enable everyone to experience the potential benefits be more specific about those with sensory impairments (visual or audio), neurotypical (dyslexia dyspraxia, autism etc), mobility/stability issues (Parkinson's, MND, Hodgkin's). **Economy:** Both policies will help to provide a better connected region, both internally and externally, bringing more people into the region and helping those within the region gain better access to jobs and services. Policy T23 is focused on supporting planned housing growth which is likely to have significant positive effects on the economy. By aligning housing growth and sustainable transport, the region will be better able to meet the mobility needs of the population, support future growth and whilst creating economically prosperous places for people to live and work. The development of a new routes brings with the potential for positive development. Both policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Health:** Both policies will help to increase further connectivity across the region and beyond. Access to activities provides the potentiality for people to participate in education, work, social, leisure, cultural, etc. opportunities which in turn contribute to overall health and wellbeing. Greater connectivity could help to make facilities easier to access, particularly for those who may not be able to access on foot, public transport or private car at present. It is not clear if future solutions will proportionately support all vulnerable groups within the region, which will depend upon the schemes themselves to ensure this objective is met. This could include things such as design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments. New mass transit may result in increased noise and air pollution for receptors close to the routes, however the overall effect on air quality and public health is considerably lower than the current reliance upon the private car. Policy T23 could result in greater prioritisation of non-motorised vehicles, which is likely to improve access for all groups inclusively only if the infrastructure is there for them to run on, to a good standard, and a wider network than presently. The prioritisation of non-motorised modes may also help low income families and those living in areas of deprivation, access free transports modes e.g. new footpaths and cycleways. **Community Safety:** Policy T23 will help to policy could help to improved connectivity for non-motorised users within new developments, ensuring footpaths/ cycleways/ green infrastructure is joined up, which will have positive effects on community safety, by reducing the number of cars on the roads by providing safe alternatives. Given that the highest number of fatalities on the EEH's roads occur on rural roads, using the user needs hierarchy, could result in an increase the number of sustainable transport modes, such as cycling and walking, helping to reduce the number of cars on the roads and therefore, reducing levels of congestion and accidents and near misses (involving cars, and non-motorised users). The delivery of a mass transit system (Policy T24) in rural areas is likely to have significant positive effects on community safety, especially given the high number of fatalities on rural roads within the region. The segregation of the transport system provides additional safety to passengers, non-motorised and motorised users, as it is assumed that measures such as bus lanes and segregated foot and cycleways will be put in place. Improved public transport connectivity may provide a viable journey alternative, particularly to those living in more rural locations, where there is a high reliance upon cars and other private modes.												

Policy Theme: Transport Orientated Developments	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T23 SA Score:	+	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T24 SA Score:	+	++	+	++	- -	- -	-	-	-/+	+	+	-	-/+
T24 We will support the development and delivery of high quality, segregated mass transit systems where there is the potential market for its long term sustainability: priority will be given to supporting the delivery of such systems in the following locations: • Cambridge (the CAM) • Milton Keynes • The A414 corridor in Hertfordshire	**Biodiversity:** Opportunities to improve connectivity (including segregated mass transit) have potential to occur through green areas and farmland which could degrade, damage or fragment habitats including potential to have significant negative impacts on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on biodiversity. Proposals coming forward as a result of both policies could commit to delivering biodiversity net gain, which will have positive effects on biodiversity, and could compensate losses. Although mitigation and enhancements are likely to be proposed to enable and strengthen ecological connections, it may take several years before new planting and species use new habitats provided. Public transport-based solutions can reduce the need for private car travel and improve air quality and noise pollution, which in turn would benefit biodiversity across the region. However, highways and rail developments can have negative impacts on biodiversity, in terms of habitat loss, fragmentation and noise impacts, particularly during construction. The exact scale and types of developments and proposals as part of these policies are unknown and the extent of effects on biodiversity are unknown, however, all proposals have the potential to deliver biodiversity net-gain. Large railway or road developments have the potential to result in large land take, whilst some smaller footpaths and cycleway schemes could be less significant or even incorporate planting and green space to encourage biodiversity. **Natural Capital and Ecosystem Services:** The introduction of new mass-transit and is likely to impact negatively on natural capital and the ecosystem services it provides. Impacts could be mitigated by avoiding particularly valuable natural capital assets such as ancient woodlands and if natural capital is enhanced elsewhere or by taking a natural capital approach to decision making in design, mitigation. It is not clear on the types of proposals that might come forward as a result of both policies (these could be rail, road, buses footpaths etc.) and how detrimental they will be on biodiversity; however, it is assumed that both policies could result in substantial land take. The scale (length) and linear nature of new mass transit, has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. There's potential that design could incorporate green spaces (e.g. footpaths and cycleways within incorporated wildflower planting) and provisionary services that could increase the region's natural capital stock. **Landscape and Townscape:** The promotion of development of proposals in rural settings can have negative effects on landscapes and townscape. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. The potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. This could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Historic Environment:** Both policies have the potential to have a negative impact on heritage assets, such as buried archaeology, and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact, which can detract from heritage assets and their unique setting, if designed inappropriately. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. Providing greater connectivity may allow heritage asset to become more accessible, presenting potential tourism opportunities. **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, new roads and railways to improve connectivity across the region are likely to result in modifications and discharges to watercourses. Policies could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. There could however, be the opportunities to include adaptation measures in design relation to flood risk, rain water harvesting and choice of materials. There's potential for both polices could help the region contribute less to climate change, through the reduction to CO2 emissions from active travel and public transport, which indirectly could reduce the risk of flooding, as per the sustainability objective. **Air Quality:** A reduction of cars on the road through public transport will have positive impacts on air quality across the region from reduced congestion. Reductions in air pollutants through a modal shift from road to rail would also have beneficial effect. This is likely to have additional beneficial effects on health and wellbeing, biodiversity natural capital and ecosystem services. It is not clear on the proposals that may come forward as a result of Policy T23. If road upgrades are made to facility more traffic from housing developments, there's potential that the reliance upon private vehicles will continue and contribute to a reduction in air quality. However, if footpaths and cycleways are introduced, more people may opt for sustainable travel modes, reducing the number of vehicles on the roads.												

Policy Theme: Transport Orientated Developments	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T23 SA Score:	+	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T24 SA Score:	+	++	+	++	- -	- -	-	-	-/+	+	+	-	-/+
	Climate Change and Greenhouse gases: Supporting the development and delivery of high quality, segregated mass transit systems will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the operational use of the systems. However, the development and delivery of these mass transit systems will likely encourage a modal shift from other, higher emitting transport modes. This has the potential to reduce GHG emissions. The impact of an increase in emissions from construction is likely to be minimal compared to the model shift generated by the delivery of mass transit systems. Supporting planned housing growth and economic activity will likely bring more people to an area, increasing operational GHG emissions through the number of journeys and require appropriate built environment (e.g. offices, housing and retail facilities). The development and operation of the built environment will likely increase GHG emissions. However, the improvement in the strategic transport infrastructure and connectivity solutions will likely encourage a modal shift from other, higher emitting transport modes. This has the potential to reduce GHG emissions. The vulnerability of the transport system infrastructure would depend on several factors. This would include whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. **Soil, Land Use, Resource and Waste:** The impact on soil, land use, resource and waste is dependent upon the proposals that come forward as a result of this policy. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Policies could result in the construction of new roads, additional lanes, rail lines, footpaths and cycleways, there is potential that this could result in the loss of land, including 'Best and Most Versatile' agricultural land. Future development could result in larger scale construction, comprising use of natural resources and generation of waste. **Noise and Vibration:** If greater connectivity was provided by public transport, or the introduction of footpaths and cycleways, there are opportunities for traffic noise to be significantly reduced. However, the introduction of large mass transit or if improved local connectivity revolves around motorised transport (e.g. road upgrades and dualling) there's potential that that localised noise pollution could increase. There is potential for an increase noise levels beyond statutory limits at new stations and stops, if proposals that included rail schemes were to be developed. However, the opportunities exist to support electrified routes like East West Rail, which could help to reduce noise pollution.												

Table 3-8 – Improving Local Connectivity

Policy Theme: Improving Local Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T25 SA Score:	+	++	++	?	-/+	-/+	-/+	-/+	-/+	+	-/+	-/+	-/+
T26 SA Score:	+	++	+	+	-/+	-/+	?	?	?	+	+	-/+	+
T25 We will work with partners to establish 'mobility hubs' in areas of significance as locations where interchange between travel modes is actively enabled.	**Population and Equalities:** Both policies are aimed at providing greater connectivity, which is likely to have positive effects on the populations living in the Heartland. As per the sustainability objective, transport developments could help to increase the capacity, connectivity and efficiency of the transportation network to support future demographic changes. Greater connectivity will help those living in more rural communities gain greater access to jobs, services and facilities. It's not clear whether both policies will ensure inclusivity and support those more deprived communities, which will depend on the projects coming forward as a result of this policy. However, mitigation could ensure that new transport developments include fair pricing, design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and/or include audio visual requirements of those with sight loss or hearing impairments. Development will need to ensure that they are accessible to all groups to enable everyone to experience the potential benefits be more specific about those with sensory impairments (visual or audio), neurotypical (dyslexia dyspraxia, autism etc), mobility/stability issues (Parkinson's, MND, Hodgkin's). The use of 'industry-led solutions' in Policy T26, may not benefit all of the community, as it may require access to and knowledge of how to use smart phones and other devices. Those elderly members of the population and/or those lower income groups without access to smart devices, may not benefit so greatly from this policy. Digital divides could inhibit the widespread implementation of robust and reliable digital transport networks. **Economy:** Economic growth will be supported by improved connectivity, reliability and journey experience as a result of improved public transport services. The extent of this growth will be context specific, it will be dependent on the current economic landscape, the economic centres served, and the scale of the intervention proposed. Improving digital connectivity between rural areas will also benefit smaller companies, who may not be based in economic hubs. Through joining existing modes of transport together will provide are more seamless transport experience, creating a more efficient system. The development of a new and improved routes brings with the potential for positive development. Provision of cycling and walking routes can help to make positive contributions to the economy through increase visitor numbers, tourism and the potential development of supporting businesses e.g. cycle hire. Policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. **Health:** Better pedestrian and cyclist facilities at bus and train stops will encourage walking/cycling in conjunction with bus/rail use which could have beneficial effects on physical and mental health and reduce emissions through non-motorised vehicle use to access public transport. More reliable public transport options may also reduce stress and anxiety brought on by train and bus delays to some. Both policies will result in greater connectivity, which is likely to provide greater access to jobs, services, recreation and open spaces, which all have beneficial effects on both physical and mental health. Access to employment can have beneficial effects on health and wellbeing across people's lives and protects against social exclusion. Investment into public transport, will reduce reliance on the private car, with the potential to reduce air pollution, which has health benefits on the EEH populations. **Community Safety:** An integrated transport system could result in higher demand for public transport, with a knock-on reduction of the number of cars on the region's roads. Reduced levels of congestion are likely to help reduce overall levels of congestion and subsequently the number of accidents and near misses. It is assumed that Interchange hubs that support the transition between modes, could include secure parking and bike storage, ensuring greater safety for all users. Frictionless travel (Policy T26) will help to join existing modes of transport together and provide a better, more seamless transport experience. This 'seamless' experience may include measure which could increase overall safety on the transport network. Policy T26 could include solutions which could provide innovative risk management solutions which may make travelling safer (e.g. live incident reporting), however, it is unclear at this stage. Cashless and ticketless travel options may also help to reduce the risk of theft and ticket touting.												

Policy Theme: Improving Local Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T25 SA Score:	+	++	++	?	-/+	-/+	-/+	-/+	-/+	+	-/+	-/+	-/+
T26 SA Score:	+	++	+	+	-/+	-/+	?	?	?	+	+	-/+	+
T26 We will work with public transport operators and the Government to develop industry-led solutions that enable frictionless travel using a combination of travel modes	**Biodiversity:** Improvements to existing walking and cycle paths can also present opportunities for ecological enhancement with associated health and wellbeing benefits. Encouraging people to cycle or walk to train stations and bus station has the potential to take cars off the road, and improve air quality and noise pollution, which will also benefit biodiversity through reduced disturbance. The infrastructure and scale of 'mobility hubs' is not known at this stage, however, if large land take is required there is potential for habitat loss, fragmentation and noise impacts, particularly during construction. However, all proposals have the potential to deliver biodiversity net-gain. **Natural Capital and Ecosystem Services:** The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystems if not compensated for. Enhancing natural capital in other areas, preferably close to negative impacts, could mitigate or compensate for natural capital degradation. The infrastructure and scale of 'mobility hubs' is not known at this stage, however, if large land take is required there is potential for habitat loss, fragmentation and noise impacts, particularly during construction. However, there's potential that design could incorporate green spaces (e.g. footpaths and cycleways within incorporated wildflower planting) and provisionery services that could increase the region's natural capital stock. Improvements to existing walking and cycle paths can also present opportunities for ecological enhancement with associated health and wellbeing benefits. Encouraging people to cycle or walk to train stations and bus station has the potential to take cars off the road, and improve air quality and noise pollution, which will also benefit natural capital and ecosystem services. **Landscape and Townscape:** Both policies could result in the addition of new cycleways and footpaths, which are unlikely to have a negative effect on the landscape, provided the new route is chosen carefully and design appropriately to its setting. Well-designed walkways and cycleways can contribute to the sense of place and appearance of an area and could present opportunities to enhance the quality of visual amenity of townscapes by managing public access through the region's towns. Increased access to towns and villages across the region may also have beneficial effects on place making, through the shaping the public realm in order to maximise shared value by paying particular attention to the physical, cultural, and social identities that define a place, whilst supporting its ongoing evolution. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact. It is not clear on the potential proposals that could come forward as a result on Policy T25, however, if large land take is required there is potential for this to result in negative impacts on the landscape and townscape. The impact of Policy T26 on landscape and townscape is uncertain and would highly depend upon the types developments brought forward and the infrastructure needed to support them. Larger scale infrastructure (e.g. masts to support digital infrastructure) may result in the replacement of greenspaces with sealed surfaces reduces which could limit the ability to reduce flooding water run-off, whilst smaller scale solutions (e.g. e-bikes) may not require large infrastructure and could less detrimental on the water environment. **Historic Environment:** Both policies have the potential to have a negative impact on heritage assets, such as buried archaeology, and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact, which can detract from heritage assets and their unique setting, if designed inappropriately. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. Providing greater connectivity may allow heritage asset to become more accessible, presenting potential tourism opportunities. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. The preference of non-motorised transport will help to reduce air pollution, which could help prevent further degradation of some of the region's unique historic assets. The reduction in noise pollution from lower levels of traffic in some areas could result in increased tranquillity, contribute to overall sense of place and the unique setting of heritage assets. **Water Environment:** Policy T25 could result in the addition of new cycleways and footpaths, through the prioritisation of non-motorised modes. Walkways and cycleways (including on-road cycle routes and off-road cycle paths) are unlikely to significantly affect water resources or contribute to flooding. They could, however, be vulnerable to flooding and poor drainage though, which would curtail their accessibility for most users. There could be the opportunity to include adaptation measures in design relation to flood risk and choice of materials. It is not clear on the potential size and scale of 'mobility hubs', however, if large land take is required there is potential for this to result in negative impacts on the water environment. The impact of Policy T26 on the water environment is uncertain and would highly depend upon the types developments brought forward and the infrastructure needed to support them. Larger scale infrastructure (e.g. masts to support digital infrastructure) may result in the replacement of greenspaces with sealed surfaces reduces which could limit the ability to reduce flooding water run-off, whilst smaller scale solutions (e.g. ticket machines) may not require large infrastructure and could less detrimental on the water environment. **Air Quality:** The encouragement of non-motorised modes and the potential additions of new walkways and cycleways would help encourage a modal shift, leading to reductions in air pollution from the transport network. This is likely to have additional beneficial effects on health and wellbeing, biodiversity natural capital and ecosystem services. Advancements in technology through 'industry led solutions' have the potential to improve air quality, for example, traffic management measures (such as speed cameras, and smart phone apps to alert												

Policy Theme: Improving Local Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T25 SA Score:	+	++	++	?	-/+	-/+	-/+	-/+	-/+	+	-/+	-/+	-/+
T26 SA Score:	+	++	+	+	-/+	-/+	?	?	?	+	+	-/+	+
	road users where there is traffic on the road so they can avoid those route) to reduce congestion on the network can reduce idling cars, and therefore, improve local air quality, especially in the city centres across the region. **Climate Change and Greenhouse gases:** Solutions for frictionless travel will help encourage a modal shift in transport with an increase in non-motorised modes perhaps used in combination with public transport modes, in accordance with the EEH user hierarchy. This will be achieved by making the use of these travel modes and the interchanging between them more convenient, predictable, reliable and safe. A reduction in the use of the motorised modes of transport, at the bottom of the hierarchy, will likely reduce GHG emissions overall. Depending on the solutions, there may be some inherent increases or decreases in GHG emissions associated with their implementation. For example, behaviour change solutions may not have any impact on GHG emissions whereas the implementation of contactless payment will require materials, construction, maintenance and operational energy, increasing GHG emissions. Although this is likely to be minimal compared to the modal shift generated by frictionless travel. Vulnerability of the transport network to climate change is likely to affect the user experience of all modes of transport. Flooding, snowfall and high temperatures and wind are all effecting transport network already, for example, delays caused by flooding or snowfall and discomfort through high temperatures. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. **Soil, Land Use, Resource and Waste:** The integration and encouragement non-motorised modes may result in less intensive developments, with less resources and lower levels of waste generation. There is also the potential for developments coming forward to make best use of repurposing existing infrastructure, which could result in a significant positive effect on soil and land use, as it would result in the use of existing land take whilst protecting greenfield land and high-quality agricultural land. It is not clear on the scale and infrastructure needed for 'mobility hubs' or the needs of 'industry led solutions' and the potential implications for soils, land use and waste. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. **Noise and Vibration:** The prioritisation of non-motorised modes and the potential additions of new walkways and cycleways would help encourage a modal shift, leading to reductions in noise pollution from the transport network. This is likely to have additional benefits on health wellbeing, biodiversity, natural capital and ecosystem services. There may however, be increased levels of noise at 'mobility hubs'. Advancements in technology and 'industry led solutions' have the potential to improve noise pollution, for example, traffic management measures (such as speed cameras, and smart phone apps to alert road users where there is traffic on the road so they can avoid those route) to reduce congestion on the network can reduce idling cars, and therefore improve local noise pollution.												

Table 3-9 – Rural Connectivity

Policy Theme: Rural Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T27 SA Score:	++	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
T27 We will work with partners to develop tailored solutions for our smaller market towns and rural areas that improve local connectivity, including exploring options for centres of mobility.	**Population and Equalities**: 25.7% of the population in the EEH region live in rural areas, which includes a greater proportion of older people. Policy T27 promote and supports solutions which are consistent with the hierarchy of user needs, this is in line with the Population and equalities sustainability objective and is expected to have a potential for significant positive effects. Improved connectivity may also help those in more rural areas access the public transport network, enabling them to access jobs and services. Local connectivity may see a shift towards the prioritization of non-motorised modes which could help low income families and those living in areas of deprivation, access free transports modes such as footpaths and cycleways. It is not clear if future solutions will proportionate and support all vulnerable groups within the region, which will depend upon the schemes themselves to ensure this objective is met. This could include things such as design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments. **Economy:** Policy T27 supports economic growth through improved connectivity, reliability and journey experience as a result of network improvements. Improving the connectivity between market towns will also improve economic prosperity across the region, helping rural communities better reach jobs and services. Tailored solutions could help to support needs of local/rural business, provide employment opportunities and ensure a strong and sustainable local economy. **Health:** There is considerable disparity between rural and urban areas in the EEH region, with urban areas generally having higher levels of deprivation in relation to health among other factors. The access to services is a significant health deprivation concern, Policy T27 could help to improve the places in which people live and work, improving health and wellbeing and outcomes of future generations. Greater connectivity could help to make facilities easier to access, particularly for those who may not be able to access on foot, public transport or private car at present. It is not clear if future solutions will proportionate and support all vulnerable groups within the region, which will depend upon the schemes themselves to ensure this objective is met. This could include things such as design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments. **Community Safety:** Improving connectivity between the regions small market towns and their rural hinterlands, could lead to better transport and safer transport options. Given that the highest number of fatalities on the EEH's roads occur on rural roads, this policy could have positive effects on community safety. Using the user needs hierarchy, could result in an increase the number of sustainable transport modes, such as cycling and walking, helping to reduce the number of cars on the roads. This could help to improve community safety within rural areas. **Biodiversity:** Interventions to improve rural connectivity have potential to occur through green areas and farmland which could degrade, damage or fragment habitats including potential to have significant negative impacts on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystems. However, the policy aims to provide 'tailored solutions' which could mean that proposals will be more sensitive to rural settings and the unique biodiversity. Developments as a result of the policy may not necessarily result in new roads and could lead to increased sustainability, which if designed well could have beneficial effects on biodiversity through reduced noise and air pollution. Proposals coming forward as a result of this policy could commit to delivering biodiversity net gain, which will have positive effects on biodiversity, and could compensate losses. Although mitigation and enhancements are likely to be proposed to enable and strengthen ecological connections, it may take several years before new planting and species use new habitats provided. **Natural Capital and Ecosystem Services:** The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystems if not compensated for. Enhancing natural capital in other areas, preferably close to negative impacts, could mitigate or compensate for natural capital degradation. It's not clear at this stage what sort of developments may come forward as a result of Policy T27, however, a 'tailored' approach could mean that proposals will be more sensitive to rural settings and the ecosystem services it provides. Developments as a result of the policy may not necessarily result in new roads and could lead to increased sustainability, which if designed well could have beneficial effects on natural capital and ecosystem services through reduced noise and air pollution. There's potential that design could incorporate green spaces (e.g. footpaths and cycleways within incorporated wildflower planting) and provisioner services that could increase the region's natural capital stock. **Landscape and Townscape:** The promotion of development of proposals in rural settings can have negative effects on landscapes and townscape. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. It's not clear at this stage what sort of developments may come forward as a result of Policy T27, however, a 'tailored' approach could mean that proposals will be more sensitive to rural settings and the region's unique townscapes and landscapes. The potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. This could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy.												

Policy Theme: Rural Connectivity	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T27 SA Score:	++	++	++	+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+	-/+
	Historic Environment: Future development as a result of Policy T27 has potential to have negative impact on heritage assets, such as buried archaeology, and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, that can have a major visual impact, detracting from heritage assets and their unique setting, if designed inappropriately. Insensitive design and large land take could result in negative effects on the region's designated heritage assets, however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. It's not clear at this stage what sort of developments may come forward as a result of Policy T27, however, a 'tailored' approach could mean that proposals will be more sensitive to rural settings and the region's unique townscapes and landscapes. Providing greater connectivity may allow heritage asset to become more accessible, presenting potential tourism opportunities. **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, development across the region are likely to result in modifications and discharges to watercourses. It's not clear at this stage what sort of developments may come forward as a result of Policy T27, however, a 'tailored' approach could mean that proposals will be more sensitive to rural settings and the region's water environment and incorporate design measures that could help protect the water environment and prevent the risk of flooding. **Air Quality:** There are limited local facilities and fewer public transport services in some rural areas of the EEH region, therefore, many individuals living in these areas will be heavily reliant on private transport which contributes to air pollution. It's not clear at this stage what sort of developments may come forward as a result of Policy T27, however, a 'tailored' approach may be sensitive to localised air pollution issues. If the policy results in increased levels of active travel and/ public transport, there's potential for significant positive effects on air quality. Conversely, if improved local connectivity revolves around motorised transport (e.g. road upgrades and dualling) there's potential that that localised air pollution may still exist or even worsen. **Climate Change and Greenhouse gases**: Supporting planned housing growth and economic activity will likely bring more people to an area, increasing operational GHG emissions through the number of journeys and require appropriate built environment (e.g. offices, housing and retail facilities). The development and operation of the built environment will likely increase GHG emissions. However, the improvement in the strategic transport infrastructure and connectivity solutions will likely encourage a modal shift from other, higher emitting transport modes. This has the potential to reduce GHG emissions. Although the construction of any developments would result in an increase in GHG emissions, the potential significance for a modal shift towards public transport would provide a decrease in GHG emissions. The vulnerability of the transport system infrastructure would depend on several factors. This would include whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. **Soil, Land Use, Resource and Waste**: The impact on soil, land use, resource and waste is dependent upon the proposals that come forward as a result of this policy. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, if the policy resulted in the construction of new roads, footpaths and cycleways, there is potential that this could result in the loss of land, including 'Best and Most Versatile' agricultural land. Future development could result in larger scale construction, comprising use of natural resources and generation of waste. A 'tailored' approach could mean that proposals will be more sensitive to rural settings and the region's best and most versatile land and incorporate design measures that could help minimise waste and seek sustainable resources. **Noise and Vibration:** Interventions to improve rural connectivity such as the introduction of new transport infrastructure to the rural environment has the potential for adverse impact on the baseline noise environment. However, this policy will be highly dependent upon the types of proposals that will come forward. If greater connectivity was provided by public transport, or the introduction of footpaths and cycleways, there are opportunities for traffic noise to be significantly reduced. However, the introduction of large mass transit or if improved local connectivity revolves around motorised transport (e.g. road upgrades and dualling) there's potential that that localised noise pollution could increase. A 'tailored' approach could mean that proposals will be more sensitive to rural settings and ensure that noise pollution is minimised, and tranquillity remains.												

Table 3-10 – Connecting to Global Markets

Policy Theme: Connecting to Global Markets	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T28 SA Score:	+	++	-/+	+	- -	- -	-	-	-/+	- -	- -	-/+	- -
T29 SA Score:	+	++	+	?	-/+	-/+	-/+	-/+	-/+	-/+	-	-/+	-
T28 We will work with infrastructure owners/operators, Network Rail, Highways England and the Government to improve public transport connectivity to international airports in order to reduce the environmental footprint of their operations, with priority given to: • Luton Airport – with a focus on improving travel opportunities via services on the Midland Mainline, and ensuring the right level of service and capacity on the Direct Air Rapid Transit service (DART) • Heathrow Airport – with a focus on improved interchange and connectivity via the Old Oak Common transport hub, and through delivery of Western Rail Access to Heathrow	**Population and Equalities:** Both policies aim to provide greater connectivity, which is likely to have positive effects on the populations living in the Heartland. As per the sustainability objective, transport developments could help to increase the capacity, connectivity and efficiency of the transportation network to support future demographic changes. Greater connectivity will help those living in more rural communities gain greater access to jobs, services and facilities. It is not clear whether both policies will ensure inclusivity and support those more deprived communities, which will depend on the projects coming forward as a result of this policy. However, mitigation could ensure that new transport developments include fair pricing, design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and/or include audio visual requirements of those with sight loss or hearing impairments. Development will need to ensure that they are accessible to all groups to enable everyone to experience the potential benefits such as those with sensory impairments (visual or audio), neurotypical (dyslexia dyspraxia, autism etc), mobility/stability issues (Parkinson's, MND, Hodgkin's). **Economy:** As one of the world's leading economic regions, the continued success is dependent upon being connected globally. Providing greater connectivity to both Heathrow and Luton may enable greater economic opportunities for the region, allowing businesses to grown nationally and internationally. These opportunities could also attract more businesses into the region, supporting further economic growth, provide employment opportunities and ensure a strong and sustainable local economy. Greater connectivity to Luton and Heathrow also presents tourism opportunities for the region. Policy T29 supports economic growth through improved connectivity, reliability and journey experience as a result of network improvements. Improving the connectivity along key inter-regional corridors will also improve economic prosperity across the region, helping rural communities better reach jobs and services, both from inside and outside of the region. **Health:** Both policies could result in greater connectivity, which could help to make facilities easier to access, particularly for those who may not be able to access on foot, public transport or private car at present. More reliable public transport options may also reduce stress and anxiety brought on by train and bus delays to some. Both policies will result in greater connectivity, which is likely to provide greater access to jobs, services, recreation and open spaces, which all have beneficial effects on both physical and mental health. Access to employment can have beneficial effects on health and wellbeing across people's lives and protects against social exclusion. Investment into public transport will reduce reliance on the private car, with the potential to reduce air pollution, which has health benefits on the region's populations. It is not clear if future solutions will proportionately support all vulnerable groups within the region, which will depend upon the schemes themselves to ensure this objective is met. This could include things such as design measures that accommodate users of larger sized electric wheelchairs or mobility scooters and providing audio visual requirements of those with sight loss or hearing impairments. Policy T28 aims to improving connectivity to international airports, supporting the aviation industry which has the potential for significant negative effects on human health. Greater connectivity could support potential future expansion of both Luton and Heathrow may see an increase in flight numbers and the need for new routes and approaches to accommodate increased capacity. Depending on schedules, this could result in low flying aircraft during antisocial hours, which could lead to lack of quality sleep and increased levels of stress and anxiety. **Community Safety:** Improving public transport connections to both Heathrow and Luton (Policy T28) could result in improved community safety. This could make using public transport a more attractive option to travel to and from airports, reducing levels of congestion on the roads around Luton and Heathrow and the use of on and offsite parking. Reductions in the use of airport parking could help to reduce levels of vehicle related crimes. There may be some additional concerns over passenger safety, with regards to rising crime rates on public transport, however, mitigation could be put in place to ensure that incidents are minimised. Improving inter-regional connectivity (Policy T29) could have beneficial effects on community safety, by ensuring a universal approach across the regions. Data sharing across the regions could lead to increased safety, more efficient transportation, and better inter-modal transport links. The policy focuses on 'identifying solutions to future needs' however, it is not clear whether community safety will be one of these future priorities, and for this reason an uncertain effect has been identified.												

Policy Theme: Connecting to Global Markets	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T28 SA Score:	+	++	-/+	+	- -	- -	-	-	-/+	- -	- -	-/+	- -
T29 SA Score:	+	++	+	?	-/+	-/+	-/+	-/+	-/+	-/+	-	-/+	-
T29 We will work with relevant Sub-national Transport Bodies, as well as Network Rail and Highways England, to prioritise the development of proposals that enable improved connectivity along the key inter-regional corridors: priority will be given to identifying solutions to future needs on the following corridors: • Swindon/Southampton – Reading – Didcot/Oxford – West Midlands • London – Luton – Bedford – East Midlands	**Biodiversity:** Policy T28 aims to improve connectivity to international airports, which could result in a reduction of journeys made to Luton and Heathrow Airports by car. Improved public transport connectivity has potential for improvements in air quality through reduction of emissions due to promotion of public transport and lesser road freight traffic due to shift to rail which can have positive effects. However, the policy in part supports the aviation industry which has the potential for significant negative effects on the region's biodiversity. Highways and rail developments can have negative impacts on biodiversity, in terms of habitat loss, fragmentation and noise impacts, particularly during construction. The exact scale and types of developments and proposals as part of Policy T29 are unknown and the extent of effects on biodiversity are unknown, however, all proposals have the potential to deliver biodiversity net-gain. Large railway or road developments have the potential to result in large land take, whilst some smaller footpaths and cycleway schemes could be less significant or even incorporate planting and green space to encourage biodiversity. **Natural Capital and Ecosystem Services:** The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystems if not compensated for. Enhancing natural capital in other areas, preferably close to negative impacts, could mitigate or compensate for natural capital degradation. Large railway or road developments have the potential to result in large land take and biodiversity loss, however, there is potential that design could incorporate green spaces (e.g. footpaths and cycleways within incorporated wildflower planting) and provisionery services that could increase the region's natural capital stock. Policy T28 aims to improve connectivity to international airports, which could result in a reduction of journeys made to Luton and Heathrow Airports by car. Improved public transport connectivity has potential for improvements in air quality through reduction of emissions due to promotion of public transport and lesser road freight traffic due to shift to rail which can have positive effects on natural capital and ecosystem services. However, the policy in part supports the aviation industry which has the potential for significant negative effects on the region's natural capital and ecosystem services. **Landscape and Townscape:** Landscapes and tranquillity are under pressure from development throughout the region. Public transport enhancements can take cars off the road, reducing congestion and having a potential benefit on the tranquillity of the region; however, new transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can have a major visual impact. Investment in the road network may result in opportunities to improve both landscape and setting of existing roads, but in general new highways have a negative impact on landscape and tranquillity. Policy T28 aims to improving connectivity to international airports, supporting the aviation industry which has the potential for significant negative effects on tranquillity. Greater connectivity could support potential future expansion of both Luton and Heathrow may see an increase in flight numbers and the need for new routes and approaches to accommodate increased capacity. This could result in low flying aircraft over areas of high landscape value (e.g. AONBs) disturbing tranquillity and the sense of place. Both policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique landscape and townscape. The development of a new routes brings with the potential for positive development. Policies could present opportunities to generate activity and vitality and help define the character of development distinctive to the surrounding areas and the wider region. This in turn could have beneficial on the tourism and the economy. **Historic Environment:** There is likely to be a negative impact on heritage assets from new roads and railways, particularly on buried archaeology and historic landscapes but also on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. Air pollution is a key factor in the degradation of surfaces of historical buildings and monuments and the impact of pollutants emitted into the atmosphere on materials is significant and often irreversible. An increase in public transport modes can have positive impacts through reducing cars in city centres, and improving the local air quality, which can have positive impacts on heritage assets. Conversely, the support of the aviation industry through Policy T28 could result in an increase in air pollution. The exact scale and types of developments and proposals as part of Policy T29 are unknown and the extent of effects on the historic environment are unknown. Large railway or road developments have the potential to result in large land take, whilst some smaller footpaths and cycleway schemes could be less significant on historic assets. Insensitive design and large land take could result in negative effects on the region's designated heritage assets; however, if the design takes into account the character and setting, there may be opportunity to protect and enhance distinctive heritage assets. Both policies have potential to increase connectivity across the region and could result in more people being access and explore the region's unique historic environment **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, new roads and railways to improve connectivity across the region are likely to result in modifications and discharges to watercourses. Policy T29 could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. There could, however, be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. **Air Quality:** Policy T28 aims to improve connectivity to international airports -. the encouragement of the reduction of journeys made to Luton and Heathrow Airports by car and improved public transport connectivity has potential for improvements in air quality through reduction of emissions due to promotion of public transport and lesser road freight traffic due to shift to rail. However, improving connectivity to international airports also supports the aviation industry which has the potential for significant negative effects on air pollution. It is unclear on the types of proposals that may come forward as a result of Policy T29. If the policy result in road network developments it is likely enable greater capacity and, therefore, will allow for more road users, increasing air pollution from vehicles. However, through improving the road network, levels of congestion may decrease which would reduce air pollution from												

Policy Theme: Connecting to Global Markets	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T28 SA Score:	+	++	-/+	+	- -	- -	-	-	-/+	- -	- -	-/+	- -
T29 SA Score:	+	++	+	?	-/+	-/+	-/+	-/+	-/+	-/+	-	-/+	-

vehicles. Investments into public transport solutions may also help reduce air pollution, through the encouragement of a modal shift to sustainable modes.

Climate Change and Greenhouse gases: Improving public transport connectivity to international airports has the potential to have a positive effect by reducing the GHG emissions associated with travel to and from the airport by encouraging the use of transport modes higher up the EEH user hierarchy. However, development of infrastructure will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the operational use of the transport systems. There will also likely be an increase in the operational GHG emissions in increasing the number of journeys on other networks (e.g. the rail network). However, the improvement of these networks could reduce GHG emissions over the operational lifecycle by encouraging a modal shift from other, higher emitting transport modes. Improving connectivity to international airports also supports the aviation industry which has the potential for significant negative effects. In which case this would result in a significant increase in GHG emissions. Solutions to develop new or on existing rail and road infrastructure will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the operational use of the transport systems (road users and rail fleet). Development in the road network is likely enable greater capacity and, therefore, will allow for more road users, increasing GHG emissions from vehicles. However, through improving the road network, levels of congestion may decrease which would reduce GHG emissions from vehicles. The vulnerability of the infrastructure would depend on whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly.

Soil, Land Use, Resource and Waste: Any new road or rail development will result in the use of raw materials. It is not clear on the scale of development, level infrastructure and the land take of schemes that come forward as a result of Policy T29, but opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new routes, could result in the loss of land, including 'Best and Most Versatile' agricultural land. Policy T28 aims to improve travel opportunities on the existing Midland Mainline which could help to preserve soils and resources through the repurposing of existing infrastructure. However, the delivery of western rail access to Heathrow is likely to be resource intensive as this is a new route.

Noise and Vibration: Policy T28 aims to improving connectivity to international airports, supporting the aviation industry which has the potential for significant negative effects on human health. Greater connectivity could support potential future expansion of both Luton and Heathrow may see an increase in flight numbers and the need for new routes and approaches to accommodate increased capacity. Depending on schedules, this could result in low flying aircraft during antisocial hours, which could lead to lack of quality sleep and increased levels of stress and anxiety. Greater connectivity provided by public transport will help to reduce traffic noise; however, if Policy T29 resulted in the introduction of large mass transit there is potential at certain locations to for an increase noise levels beyond statutory limits, if additional routes were to be developed and new stations provided. It is not clear as to whether policies will result in electrified routes, however if they are, there could be additional benefits for noise pollution.

Table 3-11 – Realising the Potential for Rail Freight

Policy Theme: Realising the Potential for Rail Freight	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T30 SA Score:	?	++	-/+	++	-/+	-/+	-/+	-/+	-	++	+	-/+	-
T31 SA Score:	?	++	-/+	+	-/+	-/+	-/+	-/+	-	++	+	-/+	-
T30 We will work with Network Rail and all relevant Sub-national Transport Bodies to develop proposals that increase freight on the rail network with priority given to the following corridors: • Felixstowe to Nuneaton • East West Railway • Southampton to West Midlands	**Population and Equalities:** Growth in the freight sector across the region present opportunities to those rural areas to gain better access to employment, supporting future population growth across the region. However, at this stage, it is not clear on the number of potential freight developments that will come forward as a result of this policy and the potential number of jobs that could be created. The conveyance of construction materials and aggregates (Policy T31) could help to support housing growth and subsequent population growth across the region. **Economy:** The Heartland is uniquely placed to benefit from growth in use of rail freight given it is at the heart of the 'Golden Triangle' for logistics with many of the world leading distribution companies already operating national distribution centres here. The EEH economy is dependent on businesses and people having access to goods. Increasing the access to freight across the region is likely to contribute to economic growth across the region. The conveyance of construction materials and aggregates (Policy T31) could help to support housing growth and subsequent population growth across the region. Transportation of goods on railways can often run during the night. **Health:** Increases in rail for freight transport could have beneficial effects on air quality and noise as well as road safety, with a potential reduction in the number of vehicles on roads in the EEH region. Increased connectivity, and improved freight infrastructure, has the potential to stimulate economic growth in the EEH region, which could increase access to jobs and services. However, at this stage, it is not clear on the number of potential freight developments that will come forward as a result of this policy and the potential number of jobs that could be created. The conveyance of construction materials and aggregates (Policy T31) could help to support housing growth and subsequent population growth across the region. This could provide greater access to housing can help individuals and families build a better quality of life, access services they need and gain greater independence. Transportation of goods on railways can often run during the night. Transportation noise has adverse effects on sleep structure and is linked to cardiovascular disease. Dependent upon freight timetabling, there is potential for increased levels of noise during antisocial hours, which could lead to lack of quality sleep and increased levels of stress and anxiety. **Community Safety:** Given that HGVs are responsible for more fatal incidents on the roads, the transition to freight is likely to improve safety by reducing the total number of lorry miles across the region. The increase in the use of freight may also help to reduce to total number of vehicles on the roads, reducing levels of congestion and indirectly improving the safety of the road network for both motorised and non-motorised users. Strategic Rail Freight Interchanges can contribute to safer, cleaner and more efficient freight by transferring road freight to rail. These opportunities could also attract more businesses into the region, supporting further economic growth, provide employment opportunities and ensure a strong and sustainable local economy. **Biodiversity:** Both policies could result in substantial development of both railway lines, interchanges and subsequent infrastructure. The scale (length) and linear nature of new railways lines, likely to occur through green areas and farmland has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on biodiversity. Although mitigation and enhancements are likely to be proposed, it may take several years before new planting and species use new habitats provided. However, development could commit to biodiversity net gain, which has potential to contribute positively to the region's biodiversity and could ensure adequate biodiversity compensation. There is potential for indirect positive effects on biodiversity through the reduction in air pollution, from the modal shift from road to rail. **Natural Capital and Ecosystem Services:** The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystem services. Both policies could result in substantial development of both railway lines, interchanges and subsequent infrastructure. The scale (length) and linear nature of new railways lines, likely to occur through green areas and farmland has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. Although mitigation and enhancements are likely to be proposed, it may take several years before new planting and species use new habitats provided. However, development could commit to biodiversity net gain, which has potential to contribute positively to the region's biodiversity and could ensure adequate biodiversity compensation. There is potential for indirect positive effects on natural capital and ecosystem services through the reduction in air pollution, from the modal shift from road to rail.												

Policy Theme: Realising the Potential for Rail Freight	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T30 SA Score:	?	++	-/+	++	-/+	-/+	-/+	-/+	-	++	+	-/+	-
T31 SA Score:	?	++	-/+	+	-/+	-/+	-/+	-/+	-	++	+	-/+	-
T31 We will work with Network Rail and all relevant Sub-national Transport Bodies to maximise the conveyance of construction materials by rail with priority given to the following corridors: • Midland Main Line – providing access into the region from aggregate sources in the Midlands • Great Western Main Line – providing access into the region from aggregate sources in western England and Wales	**Landscape and Townscape:** Road freight travel can have negative impacts on landscape and townscape, due to disruption of setting caused by noise, therefore, a modal shift to rail freight could reduce the level of noise from HGV traffic on the region's roads and lessen the impact of HGV movements through some of the Region's towns and villages. However, landscapes and tranquillity are under pressure from development throughout the region, and new linear features such as railway lines can have negative impacts on landscape setting, especially for AONB's and more rural parts of the region. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact. Rail freight interchanges could be suitable located away from areas of high landscape value and be designed to minimise their impact on the surrounding landscape. **Historic Environment:** Road freight travel can have negative impacts on the historic environment, due to disruption of setting caused by noise, therefore, a modal shift to rail freight could reduce the level of noise from HGV traffic on the region's roads and lessen the impact of HGV movements through some of the Region's towns and villages. Efficient freight movement has the potential for positive effects on the historic environment through the reduction of noise and air quality effects. In particular there will be less vibration if freight is moved away from urban centres, reducing these impacts on Listed Buildings. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact, that has the potential to erode the townscape character and the setting of built heritage and there may be a particular impact on, buried archaeology, historic landscapes and a potential impact on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens, conservation areas and undesignated assets. **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, development across the region is likely to result in modifications and discharges to watercourses. Rail freight interchanges could result in substantial land take and introduction of hard standing impermeable surfaces, which could subsequently result in increased levels of flooding. There could, however, be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. The modal shift from road to rail could help the region contribute less to climate change, through the reduction to GHG emissions, which indirectly could reduce the risk of flooding, as per the sustainability objective. **Air Quality:** The constraints on rail connectivity between Felixstowe and the Golden Triangle of Logistics places additional pressure on our strategic road infrastructure, with consequential implications for their operation and carbon emissions. Investment in rail freight will realise benefits on the strategic road network. Rail transport generally has a fewer negative impacts than road transport and is crucial in delivering significant reductions in pollution and congestion. A modal shift from road to rail is likely to help reduce HGV road traffic volumes, help to reduce air quality emissions of the overall transport network. This could result in additional benefits for health, biodiversity, water environment and natural capital and ecosystem services. **Climate Change and Greenhouse gases:** Solutions to increase freight on the rail network, maximise the conveyance of construction materials by rail and support the development of Strategic Rail Freight Interchanges will require the development of new or existing rail infrastructure. This will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the operational use of the transport systems (rail freight fleet). There will also likely be an increase in the operational GHG emissions in increasing the number of journeys on the rail network. However, the improvement of the rail network, particularly if it includes electrification of the rolling stock, and the modal shift from other higher emitting transport modes could reduce GHG emissions over the operational lifecycle. The impact of an increase in emissions from construction is likely to be outweighed when considering the model shift generated by shifting freight from roads to rail. The vulnerability of the infrastructure would depend on whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly **Soil, Land Use, Resource and Waste:** Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new routes and interchanges, could result in the loss of land, including 'Best and Most Versatile' agricultural land and damage soils adjacent to the rail line. Opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. **Noise and Vibration:** Efficient rail travel has the potential to reduce noise pollution through the reduction in traffic noise and easement of congestion. However, there is the potential at certain locations to increase noise levels, where new rail routes and interchanges are introduced, this is particularly so during construction. Dependent upon freight timetabling, there is potential for increased levels of noise during antisocial hours, which could lead to negative impacts on the health and wellbeing of the local residents. There is potential in the future for the introduction of the electrification of the rolling stock railway which could be beneficial for noise pollution.											

Table 3-12 – Strategic Freight Interchanges

Policy Theme: Strategic Freight Interchanges	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T32 SA Score:	?	++	-/+	+	- -	- -	-/+	-/+	-	++	+	-	-
T32 We will support the development of Strategic Rail Freight Interchanges where they support the ambition of this strategy	**Population and Equalities:** The shortage and cost of land-supply for industrial storage and distribution in London may see more companies relocating their distribution centres in the Heartland, which could provide further employment opportunities within the region. These could present opportunities to those rural areas to gain better access to employment, supporting future population growth across the region. However, at this stage, it is not clear on the number of rail freight interchanges that will come forward as a result of this policy and the potential number of jobs that could be created. **Economy:** The EEH economy is dependent on businesses and people having access to goods. The shortage and cost of land-supply for industrial storage and distribution in London may see more companies relocating their distribution centres in the Heartland, which could provide further employment opportunities within the region, at both the interchanges and the relocated businesses. The relocation of distribution centres may also help to support other existing businesses within the region, providing opportunities to grow regionally and nationally. **Health:** Policy T32 has potential to result in both positive and negative effects on health. The development of rail freight interchanges and the potential relocation of distribution centres could present further job opportunities across the region. Access to employment can have beneficial effects on health and wellbeing across people's lives and protects against social exclusion. However, the development of rail interchanges may have negative effects on people's health, through increased noise pollution and reduced levels of tranquillity. Dependent upon freight timetabling, there is potential for increased levels of noise during antisocial hours, which could lead to lack of quality sleep and increased levels of stress and anxiety. **Community Safety:** Given that HGVs are responsible for more fatal incidents on the roads, the transition to freight is likely to improve safety by reducing the total number of lorry miles across the region. The increase in the use of freight may also help to reduce to total number of vehicles on the roads, reducing levels of congestion and indirectly improving the safety of the road network for both motorised and non-motorised users. Strategic Rail Freight Interchanges can contribute to safer, cleaner and more efficient freight by transferring road freight to rail. **Biodiversity:** Policy T32 could result in substantial development of both the interchange sites and subsequent railway lines. The scale (length) and linear nature of new railways lines, likely to occur through green areas and farmland has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on biodiversity. Although mitigation and enhancements are likely to be proposed, it may take several years before new planting and species use new habitats provided. However, development could commit to biodiversity net gain, which has potential to contribute positively to the region's biodiversity and could ensure adequate biodiversity compensation. There is potential for indirect positive effects on biodiversity through the reduction in air pollution, from the modal shift from road to rail. **Natural Capital and Ecosystem Services:** Policy T32 could result in substantial development of both the interchange sites and subsequent railway lines. The scale (length) and linear nature of new railways lines, likely to occur through green areas and farmland has the potential to degrade, damage or fragment habitats including potential to impact on designated and non-designated sites of ecological value. The EEH region has substantial areas of Ancient Woodland and other irreplaceable habitats which, if lost, damaged or segregated would constitute a significant and permanent impact on natural capital and ecosystem services. Although mitigation and enhancements are likely to be proposed, it may take several years before new planting and species use new habitats provided. However, development could commit to biodiversity net gain, which has potential to contribute positively to the region's biodiversity and could ensure adequate biodiversity compensation. There is potential for indirect positive effects on natural capital and ecosystem services through the reduction in air pollution, from the modal shift from road to rail. **Landscape and Townscape:** Road freight travel can have negative impacts on landscape and townscape, due to disruption of setting caused by noise, therefore, a modal shift to rail freight could reduce the level of noise from HGV traffic on the region's roads and lessen the impact of HGV movements through some of the Region's towns and villages. However, landscapes and tranquillity are under pressure from development throughout the region, and new linear features such as railway lines can have negative impacts on landscape setting, especially for AONB's and more rural parts of the region. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact. Rail freight interchanges could be suitable located away from areas of high landscape value and be designed to minimise their impact on the surrounding landscape. **Historic Environment:** Road freight travel can have negative impacts on the historic environment, due to disruption of setting caused by noise, therefore, a modal shift to rail freight could reduce the level of noise from HGV traffic on the region's roads and lessen the impact of HGV movements through some of the Region's towns and villages. Efficient freight movement has the potential for positive effects on the historic environment through the reduction of noise and air quality effects. In particular there will be less vibration if freight is moved away from urban centres, reducing these impacts on Listed Buildings. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact, that has the potential to erode the townscape character and the setting of built heritage and there may be a particular impact on, buried archaeology, historic landscapes and a potential impact on the setting of other historic assets such as scheduled monuments, listed buildings, historic parks and gardens,												

Policy Theme: Strategic Freight Interchanges	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T32 SA Score:	?	++	-/+	+	- -	- -	-/+	-/+	-	++	+	-	-

conservation areas and undesignated assets.

Water Environment: The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, development across the region is likely to result in modifications and discharges to watercourses. Rail freight interchanges could result in substantial land take and introduction of hard standing impermeable surfaces, which could subsequently result in increased levels of flooding. There could however be the opportunities to include adaptation measures in design relation to flood risk and choice of materials. The modal shift from road to rail could help the region contribute less to climate change, through the reduction to GHG emissions, which indirectly could reduce the risk of flooding, as per the sustainability objective.

Air Quality: Rail transport generally has a fewer negative impacts than road transport and is crucial in delivering significant reductions in pollution and congestion. A modal shift from road to rail is likely to help reduce HGV road traffic volumes, help to reduce air quality emissions of the overall transport network. This could result in additional benefits for health, biodiversity, water environment and natural capital and ecosystem services.

Climate Change and Greenhouse gases: Solutions to support the development of Strategic Rail Freight Interchanges will require the development of new or existing rail infrastructure. This will result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the operational use of the transport systems (rail freight fleet). There will also likely be an increase in the operational GHG emissions in increasing the number of journeys on the rail network. However, the improvement of the rail network, particularly if it includes electrification of the rolling stock, and the modal shift from other higher emitting transport modes could reduce GHG emissions over the operational lifecycle. The impact of an increase in emissions from construction is likely to be outweighed when considering the model shift generated by shifting freight from roads to rail. The vulnerability of the infrastructure would depend on whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly.

Soil, Land Use, Resource and Waste: Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal but the opportunity may exist, where practicable, for upgrade works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. Conversely, construction of new routes and interchanges, could result in the loss of land, including 'Best and Most Versatile' agricultural land and damage soils adjacent to the rail line. Opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials.

Noise and Vibration: Efficient rail travel has the potential to reduce noise pollution through the reduction in traffic noise and easement of congestion. However, there is the potential at certain locations to increase noise levels, where new rail routes and interchanges are introduced, this is particularly so during construction. Dependent upon freight timetabling, there is potential for increased levels of noise during antisocial hours, which could lead to negative impacts on the health and wellbeing of the local residents. There is potential in the future for the introduction of the electrification of the rolling stock railway which could be beneficial for noise pollution.

Table 3-13 – Support Road Freight

Policy Theme: Supporting Road Freight	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T33 SA Score:	+	+	?	+	--	--	-	?	?	-/+	--	?	-
T34 SA Score:	+	+	+	+	+	+	+	+	?	++	++	-/+	+
T35 SA Score:	0	+	0	++	?	?	-	-	-	-	-	-/+	-
T36 SA Score:	+	++	+	+	0	0	0	0	0	0	0	0	0
T33 We will work with Highways England, local highway authorities and the freight sector to ensure that strategic corridors for road freight and logistics are fit for purpose: priority will be given to the following corridors: • The M25/M1 • The A34 and M40 north of Oxford • The A1 corridor (north of Huntingdon) • The A14 • The A508 into Northampton	**Population and Equalities:** Ensuring strategic road corridors are fit for purpose (Policy T33) and minimising the impact of road freight on local communities (Policy T34) are likely to have a positive effect on the population living in the EEH region. Road freight can have negative effects on the local community through being intimidating to individuals such as cyclists and pedestrians as well as noise, danger and pollution. The management of the impact of road freight on the community has potential to encourage individuals to use these modes of transport (walking and cycling). However, the application of innovative solutions to minimise impact on communities are unknown so the extent of effects on populations and vulnerable groups are uncertain at this stage, but reduced exposure to road freight could encourage more active travel. Innovative solutions (Policy T34) to reduce the impact the local communities can include new technologies to make road freight 'cleaner' through alternative fuels and as drivers' behaviour has had an impact on fuel consumption, training can be provided to encourage them to stick to speed limits and reduce idling- resulting in improved air quality, benefiting local communities. Additionally, measures should be put in place that reduced rat-running and village routes. Policy T36 aims to ensure the local servicing and support needs of the business community are met, which could help to support local businesses and provide local employment opportunities, which could be more accessible to those living in rural areas with limited access to jobs. **Economy:** Ensuring strategic road corridors are fit for purpose (Policy T33) and minimising the impact of road freight on local communities (Policy T34) through possible interventions such as the improvement of journey time reliability, reduction of congestion and improvement of traffic flows can contribute positively to the economy of the EEH region. Managing the ease of movement through the country to reduce the impacts of 'lost productive time' should be implemented. Addressing the need for secure overnight lorry parking (Policy T35) has a potential positive impact on the economy through safeguarding goods. The strategic location of lorry parking close to the operating centres will also be beneficial for the economy. Having secure corridors that support the logistics industry can also result in secure jobs, having a positive impact on the economy. Policy T36 aims to ensure the local servicing and support needs of the business community are met, which could help to support local businesses, provide employment opportunities and ensure a strong and sustainable local economy. **Health:** Ensuring strategic road corridors are fit for purpose (Policy T33) and minimising the impact of road freight on local communities (Policy T34) have potential to enable the efficient and reliable movement of road freight through improvements in journey time and reduce congestion. These are likely to improve air quality, and thus human health. The promotion of safe active travel as part of the policy theme can also lead to positive effects on human health. Innovative solutions (Policy T34) to reduce the impacts of road freight on health can include new technologies to make road freight 'cleaner' through alternative fuels and as drivers behaviour has had an impact on fuel consumption, training can be provided to encourage them to stick to speed limits and reduce idling- resulting in improved air quality, creating health benefits. A move to electric smaller freight vehicles can also result in positive impacts through a reduction in noise, which can be a nuisance and negatively impact human health. Access to employment can have beneficial effects on health and wellbeing across people's lives and protects against social exclusion. Policy T36 aims to ensure the local servicing and support needs of the business community are met, which could help to support local businesses and provide local employment opportunities, which could be more accessible to those living in rural areas with limited access to jobs.												

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T33 SA Score:	+	+	?	+	--	--	-	?	?	-/+	--	?	-
T34 SA Score:	+	+	+	+	+	+	+	+	?	++	++	-/+	+
T35 SA Score:	0	+	0	++	?	?	-	-	-	-	-	-/+	-
T36 SA Score:	+	++	+	+	0	0	0	0	0	0	0	0	0
T34 We will work with Highways England, local highway authorities and the freight sector to use improved planning and the application of innovative solutions to reduce the impact of freight on the environment, in terms of carbon emissions and its impacts on communities living in and around freight corridors.	**Community Safety:** By ensuring that that freight corridors are fit for purpose, there is potential for these to result in upgrades and possibly improved safety along these strategic roads. Looking at the impact of road freight on the local community could result in increased levels of protection from the adverse effects of road freight, which could include enhanced safety measures. It is unclear on what innovative solutions could be put in place but the use of pedestrian and cyclist autonomous emergency braking and speed limiting technology could result in significant positive effects on community safety. Lorries and their trailer loads are often very valuable and are targeted by criminals. Ensuring secure overnight lorry parking, will help to prevent against targeted crimes and has therefore, resulted in significant positive effects. **Biodiversity:** By ensuring that strategic corridors for road freight are fit for purpose (Policy T33) could further encourage road freighting and also use by private cars which would significantly increase air pollutants and noise pollution, which could be detrimental to some of the Region's biodiversity. Some of the strategic corridors that will be given priority, through Policy T33 are located near SSSIs and protected sites, the potential increase of HGV freight movement on these strategic corridors can have an adverse effect on biodiversity in these areas. There is potential for both positive and negative effects from Policy T34. Although it does not prevent road freight, the minimisation of impacts on the local community could include the protection of designated sites and local wildlife sites, which could have beneficial effects on local biodiversity. The scale, infrastructure and potential land take needed in order to provide overnight lorry parking is unknown. The application of improved planning and additions of solutions to reduce the impact on the environment (Policy T34) could has positive effects on biodiversity and opportunities may exist to secure biodiversity net gain. **Natural Capital and Ecosystem Services:** By ensuring that strategic corridors for road freight are fit for purpose (Policy T33) could further encourage road freighting and also use by private cars which would significantly increase air pollutants and noise pollution, which could be detrimental to some of the Region's. As long as improvements to strategic corridors for road freight (Policy T33) are achieved within the existing transport network the impact on natural capital is likely to be marginal but could be negative if for example new lanes need to be created. The impact of Policy T34 is uncertain and will depend on proposals being brought forward but could have negative impacts on natural capital if for example new ring roads need to be established. There is potential for both positive and negative effects from Policy T34. Although it does not prevent road freight, the minimisation of impacts on the local community could include the protection of open spaces, wildlife sites PRoWs (etc.), which could have beneficial effects on local natural capital. The application of improved planning and additions of solutions to reduce the impact on the environment (Policy T34) could has positive effects on natural capital and ecosystem services, and opportunities may exist to delivery biodiversity net gain. **Landscape and Townscape:** Road freight travel can have negative impacts on landscape and townscape, due to disruption of setting caused by noise. By reducing impacts of road freight in rural communities, this will in turn also protect local landscapes, townscapes and their character, through increased tranquillity and sense of place. This will particularly benefit AONBs as well as important undesignated landscapes. The scale, infrastructure and potential land take needed in order to provide overnight lorry parking is unknown. If large land take is required, there is potential for these sites and their associated infrastructure to have negative effects on the landscape and townscape. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact, however, negative impacts could be compensated for through sensitive design.												

Policy Theme: Supporting Road Freight	Population and Equalities	Economy	Health	Community Safety	Biodiversity	Natural Capital and Ecosystem Services	Landscape and Townscape	Historic Environment	Water Environment	Air Quality	Climate Change and Greenhouse Gases	Soil, Land Use, Resource and Waste	Noise and Vibration
T33 SA Score:	+	+	?	+	--	--	-	?	?	-/+	--	?	-
T34 SA Score:	+	+	+	+	+	+	+	+	?	++	++	-/+	+
T35 SA Score:	0	+	0	++	?	?	-	-	-	-	-	-/+	-
T36 SA Score:	+	++	+	+	0	0	0	0	0	0	0	0	0
T35 We will work with Highways England, local highway authorities and the freight sector to address the need for secure overnight lorry parking and their associated facilities	**Historic Environment:** Efficient freight movement has the potential for positive effects on the historic environment through the reduction of noise and air quality effects. In particular there will be less vibration if freight is moved away from urban centres, reducing these impacts on Listed Buildings. It is not evident whether HGV freight movement routes will be located away from protected areas to avoid negative impacts on the historic environment, therefore the impact of Policy T33 is not known. By reducing impacts of road freight in rural communities, this will in turn also protect the local historic environment (Policy T34). The scale, infrastructure and potential land take needed in order to provide overnight lorry parking is unknown. If large land take is required, there is potential for these sites and their associated infrastructure to have negative effects on historic assets and their settings. New transport infrastructure projects often require components such as street fixtures, lighting, furniture, signage, and maintenance equipment, which can also have a major visual impact, however, negative impacts could be compensated for through sensitive design. **Water Environment:** The EEH region has a wide range of Flood Zones, therefore, any development and proposals taken forward will have to take these zones into consideration. However, development across the region are likely to result in modifications and discharges to watercourses. Policy T33 has resulted in uncertain effects. If making roads that are fit for purpose would mean additional lanes it could result in substantial land take and introduction of hard standing surfaces, which could subsequently result in increased levels of flooding. If developments are online and result in improved flood adaption there could be potential for positive effects. Development in the road network is likely enable greater capacity and, therefore, will allow for more road users, increasing CO_2 emissions from vehicles. This could have indirect effects on the water environment through continued contributions to climate change. The scale, infrastructure and potential land take needed in order to provide overnight lorry parking is unknown. If large land take is required, it could have adverse effects on the water environment through replacing greenspaces with sealed surfaces reduces which could limit the ability to reduce flooding water run-off. However, sites may be small, or include updates to existing facilities, which would be less detrimental. Negative impacts could be compensated for through flood adaptation design. Minimising the impact of road freight on local communities (Policy T34) could have a positive effect on the population living in the EEH region, if innovative solutions were to include flood adaption measures. **Air Quality:** The improvement of road freight corridors (Policy T33) has potential to improve journey time and reduce congestion, which is likely to have a positive effect on Air Quality by improving the efficiency of road freight movement. By reducing the impact of road freight in villages and more rural areas (Policy T34), this will result in improved air quality for local populations. Reduced air quality issues can also benefit local biodiversity and enhance the surrounding landscape. However, the policies support development in the road network, which is likely enable greater capacity and, therefore, will allow for more road users, increasing air pollution from vehicles. Development of secure overnight lorry parking facilities will likely increase air pollution. This would be through the pollution associated with the construction and from the operational use of the facility, such as queuing, idling engines and cold starts, which could cause localised air quality issues. **Climate Change and Greenhouse gases:** Solutions to develop new or on existing road infrastructure will result in an increase in GHG emissions through the carbon and carbon associated with the construction, maintenance and from the operational use of the transport systems (road users). Development in the road network is likely enable greater capacity and, therefore, will allow for more road users, increasing GHG emissions from vehicles. However, through improving the road network, levels of congestion may decrease which												

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T33 SA Score:	+	+	?	+	--	--	-	?	?	-/+	--	?	-
T34 SA Score:	+	+	+	+	+	+	+	+	?	++	++	-/+	+
T35 SA Score:	0	+	0	++	?	?	-	-	-	-	-	-/+	-
T36 SA Score:	+	++	+	+	0	0	0	0	0	0	0	0	0
	would reduce GHG emissions from vehicles. Solutions to minimise the impact of road freight on local communities will likely shift the GHG emissions emitted from the local road network to the strategic and/or major road network. There would likely be little change in the GHG emissions as a result. However, there is the potential for reducing the GHG emissions from vehicles through improving traffic flow and congestion on local roads. However, any road infrastructure development would also result in an increase in GHG emissions through the carbon associated with the construction, maintenance and from the additional capacity in operation (road users). Development of secure overnight lorry parking facilities will likely increase GHG emissions. This would be through the carbon associated with the construction, maintenance and from the operational use of the facility. The vulnerability of the infrastructure would depend on whether the existing/new infrastructure is in vulnerable areas, the resilience of the design, the materials used in construction and the maintenance of infrastructure to ensure it can withstand chronic and acute effects of climate change (e.g. future precipitation and temperatures). The climate generally negatively effects the operation of the transport system. With future trends on climate change predicting more extreme climatic conditions, it is likely that there will be more significant effects in the future unless designed for and managed properly. **Soil, Land Use, Resource and Waste:** The need for secure overnight parking (T35), potential improvement to strategic road freight corridors (T33) and potential innovative solutions to minimise road freight impact on local communities have to potential for land use requirement. There is potential for the loss of land, which can include agricultural land (Best Most Versatile). The scale, infrastructure and potential land take needed in order to provide overnight lorry parking is unknown. Any works in brownfield sites could encounter contaminated land/soil requiring remediation or removal and disposal. It is not clear on the scale of development, level infrastructure and the land take of schemes that come forward as a result of these policies, but opportunities may exist, where practicable, for works to reuse existing materials and therefore promote waste minimisation and sustainable use of materials. **Noise and Vibration:** Road freight is a known source of noise pollution. Through managing freight movement through rural areas and villages, there will be positive effects in terms of reduced noise pollution. Through managing the logistic movement of freight across the region (Policy T33), there is the potential for reduced congestion and idling, which will also reduce noise pollution, especially in urban centres. By providing adequate parking for lorries overnight, this will reduce the noise of HGVs during unsociable hours and will limited to the sites where they are now being parked.												
T36 We will work with local transport authorities and the freight and logistic sector to ensure the local servicing and support needs of the business community are met													

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